Irrigation Effects on Corn (*Zea mays*) and Soybean (*Glycine max* L.) Yield in Clayey Soils in the Alabama Blackland Prairie Region

by

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Abstract

Precise estimates of irrigation yield effects are essential for farmers when making irrigation investment decisions. The project goal is to improve our knowledge of irrigation yield effects in the soils of the Alabama Blackland Prairie region. The study objectives encompass estimating the irrigation yield effects of corn (*Zea mays*) and soybeans (*Glycine max* L.) based on terrain, soil, and climate parameters and determining the variables with the highest effect on crop yield. We evaluated two statistical analyses: Integrated Nested Laplace Approximation (INLA) and machine learning. The first analysis, assess the individual effect of irrigation, soil, and terrain properties on crop yield, and the second analysis evaluated four machine learning algorithms, including Support Vector Machine, Elastic Net Regression, Stepwise Regression, and Random Forest, under the following aspects: 1) identification of variables influencing yield predictions, 2) yield predictions based on adjacent fields, 3) yield predictions from irrigated fields, 4) yield prediction for a specific year utilizing data from other years within the same field, and 5) yield prediction of one field for a specific year using other fields with crop production in the same years. On an area of 3,400 ha with 22 pivot-irrigated and rainfed fields in the Alabama Blackland Prairie region, the research utilized 183 yield datasets collected from shrink and swell soils from 2012 to 2021. Spatial derivatives derived from elevation information from the National Elevation Database, soil data from the POLARIS database, and drought indices calculated using precipitation, evapotranspiration, and temperature data from the Parameter elevation Regressions on Independent Slopes Model (PRISM) Climate Group were integrated into the analysis. Results from INLA showed that terrain variables had a greater effect in corn than in soybeans yield. Although, these variables had the greatest effect, the yield increase or decrease was minimum in both crops. Results from machine learning showed that the accuracy of corn and soybean yield predictions is lower when relying only on one year of training data, where terrain attributes exhibited more significant influence compared

to soil and climate properties. Conversely, incorporating data from multiple fields spanning several years and diverse crop yields into the training dataset led to greater accuracy of predictions, where the impact of climate properties is more notorious.

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Chapter 1

Introduction

Determination of precise irrigation yield effects are essential for farmers in making irrigation investment decisions. The implementation of an irrigation system greatly enhances agricultural production and mitigates the impact of climatic variability on crop yield (Calzadilla et al., 2013). In the United States about 71% of the freshwater is used for irrigation (Amarasinghe & Smakhtin, 2014). Irrigation is higher in areas of high productivity such as the corn belt, and reduced in the southeast. In Alabama, the rate of irrigation adoption remains low compared to other regions in the US despite the droughts that have occurred since early 2000's (Shange et al., 2014). Nevertheless, due to its geographical position and subtropical climate, Alabama experiences high amounts of precipitation. Although some initiatives have been created, the utilization of this technology remains limited. Various reasons have contributed to this phenomenon, such as the availability of surface water, the expenses associated with accessing groundwater, and the soil properties (Price et al., 2022). However, researchers do not attribute the low adoption to other reasons such as soil, terrain, or climate conditions.

Droughts have a significant impact on crop production due to their direct relationship with water usage (Meza et al., 2020). These droughts substantial influence in ecosystems. Particularly with regard to the impact on human lives (Z. Hao & Singh, 2015). Over time, many indices have been created to accurately detect these occurrences by integrating climatic data such as rainfall, temperature, or potential evapotranspiration. The Palmer Drought Severity Index (PDSI) (W. Palmer, 1965) is one of the most recognized and utilized drought index for assessing long-term drought

conditions. Other indices such as standardized precipitation index (SPI) McKee, Doesken, Kleist, et al. (1993) or Standardized Precipitation Evapotranspiration Index (SPEI) (Vicente-Serrano, Beguería, & López-Moreno, 2010) are also used. The study conducted by Peña-Gallardo et al. (2018) found that both, the SPEI and SPI, are effective in monitoring the impact of drought on crop yield. Also, Peña-Gallardo, Vicente-Serrano, Quiring, et al. (2019) found the direct correlation between the SPEI and crop yield. The drought duration was shown to have a significant influence on crop yield, which varied depending of the crop type. Additionally, it was shown that drought assessments over short time scale represent a significant impact on crop yield response, particularly at crucial phenomenological stages.

Sometimes areas present distinctive soil and terrain characteristics that make them difficult to manage. In Alabama there is a region called Blackland Prairie. This region encompasses the eastern part of Mississippi as well as the central and western areas of Alabama (USDA & NRCS, 2022). The soils in this area were formed from calcareous deposits from the cretaceous period and have a clayey or loamy texture with smectitic clay that entails volumetric changes depending on the water content. These soils belong to the vertisol and inceptisol soil orders.

Vertisols were first described by Van der Merwe (1949) and are distributed all over the world, covering around 2.4% of the land area worldwide and about 2.00% of the land area of the United States, primarily in Texas. They are particularly common in subhumid and semiarid tropical regions with thermic and hyperthermic soil conditions (Ahmad & Mermut, 1996). The clay content ranges from 30 to 80% (Ahmad, 1983), which results in a high water holding capacity, moderate to poor drainage, and moderate to rapid runoff that tend drop in oxygen content (Bergtold & Sailus, 2020). This distinctive composition make them shrinks when are dry and swelling when hydrated, resulting in the formation of cracks and polished surfaces, commonly referred to as slickensides. These soils have significant agricultural potential, but they are mostly covered with savanna or different types of vegetation. Particularly, due to their texture and unpredictable behavior, which present challenges for plant growth, as well as engineering problems that prevent the formation of well-developed horizons (Ahmad & Mermut, 1996).

With the use of digital soil maps researchers and farmers have access to a highly detailed map of an area, offering valuable insights into the composition and processes occurring within the soils. This includes information on soil texture (silt, sand, and clay), bulk density, pH, water content, organic matter, pore size distribution, among others. On a larger scale, terrain derivatives, offer information about the characteristics and properties of the land surface. Contrary to several data layers used for creating digital soil maps, terrain derivatives require a single data layer containing altitude information, known as Digital Elevation Model or DEM (Guth et al., 2021).

These attributes can be categorized into two types: primary and secondary (Wilson, 2012). Primary terrain derivatives, also know as basic land surface characteristics (Olaya & Conrad, 2009) are derived directly from the DEMs. Examples of fundamental terrain derivatives include slope, aspect, and curvatures measurements. Secondary terrain attributes, are derived from the combination of different primary terrain derivatives and are categorized into hydrologic, land-surface parameters, solar radiation models, and methods for the quantification of surface-atmosphere interaction (Olaya & Conrad, 2009). Terrain wetness index (WI) and stream power index (SPI) (Böhner & Selige, 2006) are two commonly secondary terrain attributes.

Besides the soil properties, terrain attributes such as elevation have demonstrated to have a high influence on crop yield (Kravchenko & Bullock, 2000). Similarly, slope and curvature directly affect the processes of infiltration and runoff. Negative curvature increases runoff, while positive curvature reduces infiltration (Daniels, Gilliam, Cassel, & Nelson, 1987). For instance, Kaspar et al. (2004) found that soybeans were more affected by pH and closed depressions on dry years, but more by curvature on dry years. Yield was reduced on lower slope positions in wet years, but not on dry years. In their study, Kaspar et al. (2003) found that during periods of below-average precipitation, there was a negative relationship between corn yield and relative elevation, slope, and curvature. Conversely, in years with above-average precipitation, there was a positive correlation between yield and relative elevation and slope. Also, it has been shown that the characteristics of the terrain are closely linked to both agricultural productivity and the levels of nutrients in crops (Kumhálová, Kumhála, Kroulík, & Matějková, 2011). The impact of precipitation, geography, and

soil factors on crop yield has been demonstrated throughout the years. These effects are reflected along a field where we find differences on crop yield, with areas of high yield production or areas of a very poor performance attributed to the spatial variability in the terrain. The combination of larger datasets of soil and terrain variables enables a better understanding of the spatial variability in corn and soybeans yield (Kaspar et al., 2004) that provide information for site-specific management.

With the low adoption of irrigation in this area, it is important to consider different aspects that might be affecting farmers decisions. Some farmers in the region have invested in pivot irrigation systems aiming to manage drought effects and increase crop production. However, over time, they have observed limited irrigation effects on crop yield, allocating this limitation to the inherent characteristics of the terrain and soils in the area. Consequently, a precise estimation of factors related to terrain, soil, and climate conditions affecting crop yield are necessary for decisions regarding irrigation investments.

1.1 Research Objectives

The goal of this project is to improve our knowledge of the irrigation effects on crop yield in the soils of the Alabama Blackland Prairie region by considering soil, terrain, and climate parameters. The objectives of this study are: **a)** to evaluate different machine learning methods on crop yield prediction and assess prediction accuracy based on different scenarios, **b)** to investigate which predictor variables have the highest impact on crop yield predictions, **c)** to evaluate the irrigation yield effects of corn (*Zea mays*) and soybeans (*Glycine max* L.) based on terrain and soil parameters on the Alabama Blackland Prairie Region, and **d)** to perform an economic analysis to determine the profitability of the implementation of an irrigation system in the research study area.

To answer the objectives, the work includes:

a) Evaluation of four machine learning algorithms: Support Vector Machine, Elastic Net Regression, Stepwise Regression, and Random Forest under the following aspects:

- Identification of variables with the highest effect on yield predictions.

- Yield predictions based on adjacent fields with the same water management.
- Yield predictions from irrigated fields.
- Yield prediction for a specific year utilizing data from other years within the same field.
- Yield prediction of one field for an specific year using other fields with crop production in the same years.

b) Calculation of variable importance to select the variables with the highest effect in crop yield predictions.

c) An Integrated Nested Laplace Approximation (INLA) analysis to evaluate the individual effect of irrigation, soil, and terrain properties on crop yield.

d) Utilization of the total annual cost of an irrigation system provided by the Alabama Cooperative Extension System to compare it with the income produced by the crop yield increase due to irrigation.

1.2 Hypothesis

We hypothesized that:

- The most accurate machine learning algorithm to create predictions will be Random Forest. This is supported by previous studies conducted by Kayad, Sozzi, Gatto, Marinello, and Pirotti (2019) or Khanal, Fulton, Klopfenstein, Douridas, and Shearer (2018) to be the best. However, the accuracy of the estimates will vary, as crop yield predictions often rely on remote sensing data. Only soil, terrain, and climatic variables will be considered for this project.
- Due the inherent characteristics of the soils in the region, the soil properties, specifically texture, will have a higher impact on crop yield predictions.
- The impact of irrigation will not be considerable at the research site due to high amount of annual precipitation.

- The irrigation effect on crop yield in the Alabama Blackland Prairie region is not greater enough to cover the total annual cost of a pivot irrigation system.

1.3 Thesis Structure

To address the aims outlined in the previous section, the thesis begins with a literature review, followed by the materials and methods, the results and discussion of the two different statistical analyses, the conclusions and main findings, limitations, and the recommendations for future research.

Chapter 2

Literature Review

2.1 Soil Classification

Thus animals and plants, soils also have a taxonomic classification that separates them in groups with characteristics in common. The United States Department of Agriculture (USDA) classifies the USA land regions into the Major Land Resources regions (MLRA) according to their location, topography, vegetation, geology, engineering, etc (Austin, 1965). In total, 273 MLRA have been described. One MLRA of particular interest is the Alabama and Mississippi Blackland Prairie MLRA 135A. This MLRA is also known as the Blackland Prairie or Black Belt is situated in eastern Mississippi and central and western Alabama (USDA & NRCS, 2022) covering a land area of up to 2,632,722 ha with an average annual rainfall between 1,350-1,550 mm, and average annual temperature between 15-19 °C. The soils in this area were formed from calcareous sediments from the cretaceous and present a clayey or loamy texture with smectitic clay that shrinks and swells depending on the water content.

These soils are part of the vertisol and inceptisol soil orders, and have an inherent fertility that is optimal for agricultural production. However, they have suffered from erosion, result of extensive cotton cultivation between 1850 and 1920 (Dixon & Nash, 1968). The soils can vary from very shallow or very deep with typical slopes that ranges from 0-8%. Due to its high clay content and water holding capacity, the soils have a moderate to poor drainage, and a moderate to rapid runoff that can cause a decrease of oxygen content (Bergtold & Sailus, 2020). The predominant soil series are Houston, Vaiden, and Oktibehha.

2.1.1 Vertisols

As one of the most common soils order in the region, vertisols stands out as one of the most interesting. Initially described by Van der Merwe (1949) as a dark clay soil with unusual characteristics. These soils are distributed all over the world, occupying around 2.4% of the land area worldwide, and approximately 2% of the land area of the United States, primarily in Texas. They are particularly common in subhumid and semiarid tropical regions with thermic and hyperthermic soil regimes (Ahmad & Mermut, 1996). They were formed from various parent materials, including calcareous sedimentary rocks (Dixon & Nash, 1968). These rocks experienced weathering and erosion processes, resulting in gentle slopes of less than 8%. One particular characteristic of these clayey soils is their unique behavior which causes a volume fluctuation depending on the water content.

These soils exhibit different characteristics as determined by their composition and location. The nature of the parent material can determine whether it reacts as acidic, neutral, or alkaline; however, the must commons are neutral and alkalines (Ahmad & Mermut, 1996). These soils typically originate from calcareous sediments that gradually fragments into smaller compounds known as montmorillonites, a type 2:1 clay mineral that are part of the phyllosilicates group. These soils are mainly constituted by clay and loam textures (Bergtold & Sailus, 2020). The clay content ranges from 30 to 80% (Ahmad, 1983) that shrinks when are dry and swelling when hydrated, causing cracks and polished surfaces, better known as slickensides.

When describing Vertisols, their color can vary considerably, ranging from very dark to brownish. These soils exhibit moderate to poor drainage and medium to fine, granular or massive structures. This structural composition results in a low infiltration and low permeability, making them susceptible to flooding and prone to decrease oxygen concentration through the profile. Vertisols can range in depth from shallow to very deep with a very low organic matter content. However, they have a high chemical activity with a CEC between 20 and 45 cmol/kg (Staff, 1999) that become then exceptionally fertile, ideal for agricultural production. Despite their agricultural potential, most of these soils remain uncultivated, and are covered with savanna or different

types of vegetation, because their texture and unpredictable behavior that present challenges for the correct growth of plants, as well as serious engineering problems that restrict the formation of well-developed horizons (Ahmad & Mermut, 1996).

Cracking Behavior

The capacity of the soil to change the volume, leads to fluctuations in bulk density (Cornelis et al., 2006) and porosity (Wang et al., 2022). This intricate process promotes to the formation of cracks and slickensides between aggregates (Ahmad & Mermut, 1996; Blokhuis, 1982). The cracking behavior is complex to measure because some of these vertisols tend to form a microtopography called gilgai, which is a surface formation of knolls and depressions (Kishné, Morgan, & Miller, 2009). These cracks often measure 1 cm wide or more, and can be classified into four categories: structural shrinkage, linear shrinkage, residual shrinkage, and zero shrinkage.

In the first category, the water lost does not have a macroscopic effect on soil volume (Ahmad & Mermut, 1996; Yule & Ritchie, 1980). In the second stage, the change in soil volume is equivalent to the change in water content (Ahmad & Mermut, 1996; Yule & Ritchie, 1980). In the third stage, the change in soil volume is lower than the change in water content (Ahmad & Mermut, 1996). In the last stage, when the water content fluctuates, the volume of the soil is detectable (Cornelis et al., 2006). To quantify the capacity of a soil to swell and shrink, the coefficient of linear extensibility (COLE) is used. In vertisols the values range between 0.07 to 0.2 (Staff, 2015).

Depending of the cracks category, some benefits could be present, such as facilitate a rapid water infiltration, although, some concerns persist. The rapid water movement through the profile makes the lower part wetter first while the surface is still dry, which represent a problem if there are crops in the area (Bergtold & Sailus, 2020), or infiltration of some pollutants to the groundwater (Lin, Mclnnes, Wilding, & Hallmark, 1998). However, some of these concerns can be mitigated through strategic management practices, such as tillage, which disturbs the cracking patterns (Bergtold & Sailus, 2020).

2.2 Soil Physical Properties

The horizons of a soil profile provide valuable information about their historical development (Hartemink et al., 2020). While some observations around a field reveal some differences in both the profile and the landscape, certain differences are no easy to identify. These variations are product of different physical, chemical, and biological properties provided by different soil forming factors (Jenny, 1994). The soil is comprises of three phases; solid, liquid, and gaseous. The solid phase of the soil is compounded by different mineral components known as texture, which is one of the most important and stable features of the soil. The mineral part is formed by silt, sand, and clay particles with different particle sizes between 2 mm to ≤ 0.002 mm (of Soil Survey, 1993). The combination of these soil particles leaves empty spaces between them called pores (X. Hao, Ball, Culley, Carter, & Parkin, 2008) which are filled with either air or water. This fraction of the total soil volume occupied by the pore space is measured by the porosity (ϵ) that ranges from 0-1, usually 0.3 to 0.7 in vertisols (Nimmo, 2004). Some of the spaces are larger than others, thus making the soil more friable or more compact.

The indicator of the state of soil compaction is assessed by the bulk density (ρb) (Buckman & Brady, 1960; Grossman & Reinsch, 2002). It represents the mass or weight of a certain volume of soil (Indoria, Sharma, & Reddy, 2020). The bulk density is affected by the texture and the pore space. For example, sandy and rocky soils, have a high bulk density because the pore space is lower. On the contrary, soils rich in organic matter or high clay or silt content have a lower bulk density, because the pore space is higher (Sullivan, Shaw, & Rickman, 2005). The variation in size, frequency, and arrangement of the spaces between soil particles is called soil structure. This organization influence directly edaphic conditions (Bronick & Lal, 2005). It impacts the water holding capacity (Emerson, 1995), the distribution of pore size and space, the availability of nutrients for plant uptake (Chaudhari, Ahire, Ahire, Chkravarty, & Maity, 2013), as well as the capacity and velocity of infiltration, and runoff (Horton, 1933) which affect directly the optimal plant growth.

The liquid phase of the soil is not constituted just of water; it also includes colloids, solutes, and microorganisms (Ochsner, 2019). It is located in the pore space between solid particles that are not filled with air (Topp & Ferre, 2002). The water in the soil, can be retained or moved through it. The water contained in the soil can be measured in two different ways, as volumetric water content (θ), which is a measure of the volume of water over the volume of soil, and gravimetric water content (θ_g), which is a a measure of the mass of water over the mass of dry soil (Gardner, Robinson, Blyth, & Cooper, 2000).

The water is moved through the soil profile by potential energy (Or, Wraith, & Warrick, 2002). The differences in the soil water potential cause water to flow from areas of higher water potential to areas of lower water potential (Papendick & Campbell, 1981). The water movement through a saturated soil is measured by the saturated hydraulic conductivity (*ksat*) (Klute & Dirksen, 1986). Soils with a higher content of sand particles present a higher pore space, thus, a higher *ksat*. Soils with a higher content of silt and clay particles present a lower pore space, resulting in a lower *ksat*.

Water content can be represented graphically using Soil Water Retention Curves (SRWC). These SWRCs express the amount of water retained in the soil in equilibrium at a specific soil water potential (Tuller, Or, & Hillel, 2004). Three water content states are represented by the curve; saturation, field capacity, and permanent wilting point. However, even after the soil water has been drained, some water is still retained. Better known as residual soil water content, which requires a lower matric potential to be removed (Zhai, Rahardjo, & Satyanaga, 2017).

At the same matric potential, soils with higher sand content retain less water than soils with higher clay and loam content (Ochsner, 2019). The amount of water retained in the soil directly influences plant growth, affecting plant transpiration (Bittelli, 2011), germination, and nutrient availability in the soils, as well as soil processes such as infiltration, percolation, evaporation, drainage, runoff, and ground water recharge (Jabro, 1992).

Gaseous Phase

The gaseous phase of the soil is located in the pore space between the solid particles that are not filled with water. The liquid and gaseous phases are closely linked, and the increase in one involves the decrease in the other. High crop productivity is dependent on good soil respiration. It can be affected by texture, temperature, water content, pH, organic matter, or land use (Hillel, 1998). A well-drained soil has a composition of gasses similar to that of the atmosphere (nitrogen 79.2%, oxygen 20.6%, and carbon dioxide 0.25%), however, the oxygen concentration could decreases to levels near zero. This decrease produces particular chemical reactions such as denitrification, or changes in the composition of gasses, such as hydrogen sulfide (H_2S), methane (CH_4), and ethylene (C_2H_4) or reduction of mineral oxides, such as iron or manganese (Shukla, 2014).

2.3 Digital Soil Maps

Since the invention of the GPS, the possibility to implement geographic information (also known as geospatial data or spatial data) to soil maps has been possible. It can be represented in vector or raster format (Wilson & Gallant, 2000) through different type of data layers such as imagery, elevation, boundaries, that combined, are the base of digital mapping (Brase, 2018). Soil maps can be produced by combining field data, laboratory analysis, soil observations, and different statistical methods that reveal spatial patterns of soils over space and time (Grunwald, 2010).

When creating the maps, an important aspect to consider is the accuracy. For some layers like field data, the accuracy will depend on the sampling technique, because some of them represent a more realistic scenario of the variability in the terrain. Stratified simple random sampling, is considered as one of the best samplings designs to create soil maps (Levi & Rasmussen, 2014) that leads into more accurate soil maps with a appropriate representation of soil properties (Demšar, Harris, Brunsdon, Fotheringham, & McLoone, 2013). But when data is obtained from databases like the web soil survey we can create completely inaccurate maps if the soil map unit does not correspond with the real soil type (Brus, Kempen, & Heuvelink, 2011).

Nowadays, open sources platforms provides very accurate and low cost data for creating digital soil maps. One example is the POLARIS database. This database contains soil series probabilities for the United States, featuring a spatial resolution of 30 m (Chaney et al., 2016) and provides information about thirteen soil properties (Table 2.1) across different depths (0-5, 5-15, 15-30, 30-60, 60-100, 100-200 cm). Additionally, it provides statistical measures such as mean, mode, percentile 5, percentile 50, and percentile 95.

Table 2.1: List of soil properties from Polaris database.

Variable	**Abbreviation**	**Unit**
Sand	sand	%
Silt	silt	%
Clay	clay	%
Bulk density	db	g/cm^3
Saturated soil water content	theta_s	m^3/m^3
Residual soil water content	theta_r	m^3/m^3
Saturated hydraulic conductivity	ksat	$log10(cm/hr)$
Soil pH in H_20	ph	N/A
Organic matter	om	log10 (%)
Pore size distribution index (Brooks Corey)	lambda	N/A
Bubbling pressure (Brooks Corey)	hb	log10 (kPa)
Measure of the pore size distribution (van Genuchten)	n	N/A
scale parameter inversely proportional to mean pore diameter (van Genuchten)	alpha	log10 (kPa-1)

2.4 Terrain Derivatives

The soil maps provides valuable insights into the composition and the processes within the soils. Similarly, terrain derivatives provide information about the characteristics and properties of the land surface. Terrain attributes such as elevation have demonstrated to have a high influence on crop yield (Kravchenko & Bullock, 2000). Similarly, slope and curvature directly affect the processes of infiltration and runoff. Negative curvature increases runoff, while positive curvature reduces infiltration (Daniels et al., 1987). For instance, Kaspar et al. (2004) found that soybeans were more affected by pH and closed depressions on dry years, but more by curvature on dry years. Yield was reduced on lower slope positions in wet years, but not on dry years. Kaspar et al. (2003) revealed that during periods of below-average precipitation, corn yield was negatively correlated with relative elevation, slope, and curvature, on the contrary, and in years with higher than normal precipitation, yield was positively correlated with relative elevation and slope. Furthermore, it has been shown that the characteristics of the terrain are closely linked to both agricultural productivity and the levels of nutrients in crops (Kumhálová et al., 2011).

Unlike the different data layers that can be used to create digital soil maps, terrain derivatives require a single data layer containing altitude information. The altitude information for a specified location are represented typically in a raster format in Digital elevation models (DEM). The DEMs can be obtained from The National Elevation Dataset (NED) (D. Gesch et al., 2002). The NED is a mosaic of elevation data, presented in a 1:24,000 scale (commonly referred as the 7.5 minute quadrangles) of the United States. This database provides data with a resolution of one-third arc-second, equivalent to approximately 10 meters in a TIFF format. Widely recognized for its applications in hydrologic modeling, resource monitoring, mapping, and visualization applications (D. B. Gesch, Evans, Oimoen, & Arundel, 2018), the NED assigns specific names to each downloaded DEM that provides valuable information. For example, one of the downloaded DEMs was labeled ”ned10m30084h8”, where ”ned10m” represents 7.5-minute DEM, ”30” and ”084” represent Degrees Latitude and Degrees Longitude, and ”h8” stands for the Map Index Number

for the Morrison Quadrangle. This database can be accessed through the NRCS Geospatial Data Gateway (GDG).

With the information obtained from the NED we can calculate different terrain attributes. This attributes can be categorized into two types: primary and secondary (Wilson, 2012). Primary terrain derivatives, also know as basic land surface parameters (Olaya & Conrad, 2009), derived directly from the DEMs. Some examples of primary terrain derivatives are slope, aspect, and curvatures measurements. Secondary terrain attributes, are a combination of different primary terrain derivatives and are separated into hydrologic, land-surface parameters, and solar radiation models and methods for the quantification of surface-atmosphere interaction (Olaya & Conrad, 2009). Terrain wetness index (WI) and stream power index (SPI) (Böhner & Selige, 2006) are recognized secondary terrain attributes.

A frequently used tool for calculating terrain derivatives is SAGA GIS (Conrad et al., 2015), an open-source software initially developed at the University of Göttingen, Germany, in the early 2000s and continuously updated until now. SAGA, along with other GIS software like ArcGIS or QGIS, facilitates map creation, interpolations, and various geostatistics calculations. SAGA has a user-friendly Graphical User Interfaces (GUI) (available at `https://saga-gis.sourceforge.io/en/index.html`). Additionally, it can be utilized in R software (R Core Team, 2023) through "RSAGA" (Brenning, Bangs, & Becker, 2022) R package and as a QGIS plug-in. SAGA is structured into different modules that covers data import and export, vector tools, raster tools, terrain analysis, cartographic projections, image analysis, and geostatistics.

2.5 Drought

Droughts have a significant impact on ecosystems. The greatest impact of these events lies on on human lives (Z. Hao & Singh, 2015). According to its impact, drought can be classified into four categories: meteorological, hydrological, agricultural, and socioeconomic (Mishra & Singh, 2010). The agricultural sector is vulnerable to drought because of its direct relationship with water usage (Meza et al., 2020), being about 71% of the freshwater used for irrigation (Amarasinghe &

Smakhtin, 2014), and its direct effect on the decline in food production (Pan et al., 2000), which increases food insecurity.

2.5.1 Drought Indices

Monitoring drought is a very important aspect of agricultural production. Over the years, numerous indices have been developed to effectively identify these events. Some indices are directly associated with crops, including the Normalized Difference Vegetation Index (NDVI) (Tucker, 1979), which measures vegetation density and health; the Vegetation Condition Index (VCI) (Unganai & Kogan, 1998), which identifies the climate impact on vegetation and its change over space and time, and the Crop Moisture Index (CMI) (W. C. Palmer, 1968), that produces a short-term representation of agricultural drought, among others.

Rainfall is included in the standardized precipitation index (SPI). Precipitation and temperature are used in other indices, such as the Palmer Drought Severity Index (PDSI) (W. Palmer, 1965), which is widely used and known to measure long-term drought. Other indices, such as Standardized Precipitation Evapotranspiration Index (SPEI) (Vicente-Serrano et al., 2010), combine precipitation and evapotranspiration. Some are directly related to soil moisture, such as the Standardized Soil Moisture Index (SSI) (AghaKouchak, 2014), and the Soil Water Deficit Index (SWDI) (Keshavarz, Vazifedoust, & Alizadeh, 2014). However, some compounded indices have been produced with complete integration of remote sensing, climate, soil moisture, rainfall, temperature, evapotranspiration, to produce more accurate estimations, such as the Vegetation Drought Response Index (VegDRI) (Brown, Wardlow, Tadesse, Hayes, & Reed, 2008), the Microwave Integrated Drought Index (MIDI) (Zhang & Jia, 2013), and the Integrated Surface Drought Index (ISDI) (Wu et al., 2013). These indices are important tools for monitoring and assessing drought conditions during crop season to mitigate droughts. They can also be used to provide early warning of potential drought events to reduce their impacts.

Palmer Drought Severity Index (PDSI)

The Palmer Drought Severity Index (PDSI) (W. Palmer, 1965) is a widely used index to monitor long-term drought that requires prior historical temperature and precipitation data to estimate the drought. The values range from -10 when is dry to 10 when is wet. However, most of the monitoring maps presented by drought monitoring agencies use a range from -4 to 4 (Table 2.2).

Table 2.2: Description of PDSI classification.

Value	**Description**
4.0 and above	Extremely wet
3.0 to 3.9	Very wet
2.0 to 2.9	Moderate wet
1.0 to 1.99	Slightly wet
0.5 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.5 to -0.99	Incipient dry spell
-1.0 to -1.99	Mild drought
-2.0 to -2.99	Moderate drought
-3.0 to -3.99	Severe drought
-4 or less	Extreme drought

Standard Precipitation Index (SPI)

The Standard Precipitation Index (SPI) (McKee et al., 1993) is a widely used meteorological drought index that monitors precipitation deficiency and drought conditions over time scales of 1, 2, 3, 6, 9, and 12 months. The index classifies the drought from - 0.50 to -2.0 (Table 2.3).

This index is calculated using the following formula:

$$SPI = \frac{P - P_i}{\sigma} \tag{2.1}$$

Where P is the total precipitation of a period of time, P_i is the mean precipitation for the same time period, and σ is the standard deviation of precipitation for the same period.

Table 2.3: Description of SPI classification.

Value	Description
-0.99 to -0.50	Mild drought
-1.49 to -1	Moderate drought
-1.99 to -1.50	Severe drought
$<$ -2.0	Extreme drought

Standardized Precipitation Evapotranspiration Index (SPEI)

The Standardized Precipitation Evapotranspiration Index (SPEI) (Vicente-Serrano et al., 2010) is a modification of the SPI. However, this index considers potential evapotranspiration. To compute this index potential evapotranspiration and precipitation data are necessary. First, it requires the calculation of a water balance, which is the difference between precipitation and potential evapotranspiration. The same classification from the SPI is used (Table 2.4). This index is calculated using the following formula:

$$SPEI = \frac{P - PE}{\sigma} \tag{2.2}$$

Where P is the total precipitation over a period of time, PE is the potential evapotranspiration for the same time period, and σ is the standard deviation of precipitation minus potential evapotranspiration for the same period.

Table 2.4: Description of SPEI classification.

Value	Description
-0.99 to -0.50	Mild drought

Continued on next page

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Value	Description
-1.49 to -1	Moderate drought
-1.99 to -1.50	Severe drought
$<$ -2.0	Extreme drought

2.6 Crop Production

The land use in Alabama is predominantly timberland areas with about 65% of the total land area, followed by agricultural land with about 26% of the total land area (Adjei, Li, Narine, & Zhang, 2023). In this agricultural land, the most produced crops are cotton, followed by soybeans, corn, wheat, and peanuts (U.S. Department of Agriculture, 2022). Some of the farms in the state use conventional tillage, while others employ conservation tillage and no-till practices to enhance soil health by boosting the microorganism population and reducing the fluctuation of soil temperature (Kladivko, 2001).

The goal of a crop production is to obtain the best crop yield by reducing production costs. This includes proper water, nutrient, and agronomic management. However, during the crop cycle, there are several factors that affect plant growth, such as pests, weeds, and unfavorable climate conditions which might have a negative impact, and thus, reduce crop production.

Crop yield can be measured using different sensors that are integrated in combine harvesters. Some direct methods, include volume, weight, and impact, and some indirect methods, include radioactivity, capacitance, grain separation, etc (Kutzbach & Schneider, 1997; Reyns, Missotten, Ramon, & De Baerdemaeker, 2002). With the information provided by the sensors, yield maps can be computed to monitor and understand the field and to identify the areas of lower and higher production over the years.

2.6.1 Crop Yield Measurements Errors

Approximately 10 to 50% of significant errors are identified within yield data (Simbahan, Dobermann, & Ping, 2004). These errors are categorized into four groups: harvesting, yield and moisture measurement, positioning system accuracy, and errors attributed to the operator (Lyle, Bryan, & Ostendorf, 2014). To eliminate these errors, some methods and tools have been developed, such as the Yield Editor 2.0 software developed by Sudduth, Drummond, and Myers (2012), which provides a straightforward way to fix yield errors in maps. It leverages six distinct filtering techniques to enhance data quality and reliability:

- Grain flow delay: adjust the time passed between harvest and sensing.
- Start and end pass delay: eliminates data points collected at the beginning and exit of the row.
- Minimum and maximum velocity: eliminates data points outside the maximum and minimum velocity established.
- Smooth velocity: eliminates abrupt velocity changes.
- Minimum swath: eliminates data points outside the minimum and maximum yield thresholds.
- Standard deviation: remove data points outside the number of standard deviations determined.
- Position: deletes single data points from the area of interest.
- Manual: eliminates any errors that were not removed using the previously described filter methods.

Some errors, such as spatial or local outliers, remain. As a result, Vega, Córdoba, Castro-Franco, and Balzarini (2019) created a protocol for automated error removal that consists of four steps:

- Removal of data points outside the maximum yield: lower and maximum possible yield ranges are established to avoid unreliable yield data points produced by the combined harvester and operator.

- Removal of boundary effects: technical problems such as harvest start and finish delays might produce edge effects, thus producing point data sets with exaggerated minimum or maximum values.

- Removal of global outliers (±3 SD): to remove the global outliers, the mean and the standard derivation (SD) are calculated , and all yield data outside of mean ±3 SD is removed to obtain a more symmetric distribution.

- Removal of local outliers (LM): the Local Moran (LM) of spatial autocorrelation is used to determine local outliers and to identify the values of an observation and the average of its surroundings. The Moran's Index will be positive if the values have a tendency to cluster spatially; however, if the values are not spatially correlated, the index will be negative and the data points must be eliminated.

2.6.2 Crop Yield Prediction

Machine learning methods have been used in agriculture for several years (McQueen, Garner, Nevill-Manning, & Witten, 1995) and has demonstrated to predict an appropriate yield prediction, but still needs improvements (Filippi et al., 2019). Machine learning is part of artificial intelligence (AI) and has the ability to learn (Samuel, 1959). It can be used to create crop yield predictions based on several features (Van Klompenburg, Kassahun, & Catal, 2020). In modern agriculture, machine learning has reached significance importance with applications in different areas such as livestock, soil, water, and crop management. Within crop management, it is widely used for predicting crop yield, being one of the most used techniques (Benos et al., 2021) this crop yield predictions are used to reduce losses by identifying variables the might be affecting the crop (Burdett & Wellen, 2022). However, sometimes predict crop yield can be challenging due to

the growing acknowledgment that the connections between ecological variables are often complex and non-linear (Burdett & Wellen, 2022; D'Amario et al., 2019; González Sánchez, Frausto Solís, Ojeda Bustamante, et al., 2014).

Crop yield prediction is a challenging problem in precision agriculture (Van Klompenburg et al., 2020). It is a technique that can be used to help farmer to predict crop yield or determine crop yield production in areas that have not been cultivated. These yield predictions can be developed using different model techniques such as machine learning or crop models. The selection of the most suitable technique depends on the characteristics of the data set. The selection can vary depending on whether the data is categorical or continuous, symmetric or unbalanced, correlated or uncorrelated, and the number of samples and predictors (Kuhn, Johnson, et al., 2013).

To asses a model, the data needs to be separated into train and validation data sets. The training data is typically larger than the validation data. The data is used to fit the model and learn different patterns, and then the model is used to predict the observations in the validation data set. According to Van Klompenburg et al. (2020) some of the most used features to predict crop yield are temperature, rainfall, and soil type. On the other hand, Benos et al. (2021) found that the most usual features implemented are remote sensing, weather, and soil parameters. In both literature reviews, authors concluded that the most efficient ML model was Artificial Neural Network (ANN).

In contrast, crop models which are mathematical algorithms that use quantitative information of agronomy and crop physiology to explain crop predictions and development (Asseng, Zhu, Basso, Wilson, & Cammarano, 2014; Boote, Jones, & Pickering, 1996). Some models like The Agricultural Production Systems Simulator (APSIM), developed to simulate biophysical process in farming systems (Keating et al., 2003). The Decision Support System for Agrotechnology Transfer (DSSAT) (Jones et al., 2003) a worldwide used model originally developed to integrate information about soil, climate, crops, and management to reproduce technology from one location to other with different conditions (Tsuji, Hoogenboom, & Thornton, 1998).

2.7 Machine Learning Algorithms

When dealing with big data, machine learning algorithms are widely used. However, computational time is very important, because models can take a few hours or several days to be processed (Kuhn et al., 2013). These models can be used to classify or to predict features. These algorithms have been used in different fields such as social media (Chavan & Shylaja, 2015), disease detection (Pahuja & Nagabhushan, 2021), fraudulent credit cards (Awoyemi, Adetunmbi, & Oluwadare, 2017), or digital soil mapping (Moonjun, Farshad, Shrestha, & Vaiphasa, 2010).

2.7.1 Random Forest

Random Forest is a widely used machine learning algorithm. It is a combination of decision trees that randomly select variables at each node to determine the split with the same distribution for all trees in the forest (Breiman, 2001). It is used for classification and regression. This algorithm uses bootstrap aggregation (bagging) (Breiman, 1996) to reduce variance withing the data set and achieve a higher accuracy.

One of the advantages of employing random forest for prediction modeling is that it can handle large data sets, avoid over-fitting in the predictions, and speed of process (Kuhn et al., 2013). other technique to increase the efficiency of the model, is the reduction of number of predictors (Speiser, Miller, Tooze, & Ip, 2019).

Over the years, this model has demonstrated to be very efficient when predicting different features. For example, yield in wheat, maize, potato, and silage maize Jeong et al. (2016), or in soil science, to create geopedologic maps in inaccessible areas (Moonjun et al., 2010), predict soil classes (Stum, Boettinger, White, & Ramsey, 2010), predict soil properties (Hengl et al., 2015), or predict parent material (Heung, Bulmer, & Schmidt, 2014). In R software (R Core Team, 2023) there are two packages commonly used to asses this analysis; the ”randomForest” package (Liaw & Wiener, 2002) and the ”caret” package (Kuhn & Max, 2008).

2.7.2 Support Vector Machine

It was proposed by Cortes and Vapnik (1995). It is a classification and regression model that can plot observations as points in space. This method finds the best boundary known as hyperplane that maintains the maximum observations within the margins (Witten & James, 2013). The support vectors are the closest data points to the margins from each class. However, is not always possible to separate the classes in a linear plane, for this, the Kernel trick is used. This method maps non-linear data into a higher dimensional space where a hyperplane can separate the classes. This method has been widely used in bioinformatics (Bradford & Westhead, 2005), econometrics (Cincotti, Gallo, Ponta, & Raberto, 2014), analytic chemistry (Li, Liang, & Xu, 2009), among others.

2.7.3 Elastic Net Regression

Elastic net is a regularization procedure for linear regression that performs automatic variable selection (Zou & Hastie, 2005). The regularization aims to improve predictions based on ordinary least squares (OLS) by continuously shrinking variables estimates toward zero (Hans, 2011). This occurs when the number of parameters to estimate the target variable is higher than the number of samples used. Sometimes the OLS performs poorly and some penalization techniques are used to improve the model. The first technique is ridge regression (Hoerl & Kennard, 1970). It reduces the sum of squares on the L_2-penalty, enforcing the slope coefficients to be lower but no zero. It does not remove predictors in the model, but minimizes their impact. The second technique is lasso (Tibshirani, 1996). It is a penalized least squares method that uses an L_1-penalty on the regression coefficients, setting the irrelevant values to 0, and removing features from the model.

2.7.4 Stepwise Regression

This model has a step-by-step iterative process of adding only the most important variables and eliminating the remaining variables (Efroymson, 1960). Every time a regression from a dataset is calculated, some not significant variables are present. Therefore, a selection process to eliminate

these variables is necessary. There are three types of stepwise regression; forward-selection, that start the process with no explanatory variables and then add the variables by testing them one by one , based on which is the most statistically significant until the model does not improve anymore.

Backward-elimination, is the opposite to forward-selection. It starts with all the explanatory variables and gradually eliminates the variables least statistically significant that most decrease the performance of the model.

Bi-directional, it is a combination of forward-selection and backward-elimination. It starts without explanatory variables and adds variables one by one. But at the same time, the model can also exclude variables (Pope & Webster, 1972). This model has been used in soil science to identify the influence of environmental factor that affect the variability of heavy metals in soils (Lv, Liu, Zhang, & Dai, 2013) or to predict soil properties (Yu, Kong, Wang, Du, & Qie, 2018).

2.8 Bayesian Statistics

Classic statistics approaches introduce the probabilities from random events resulting from different treatments and replications. The probability is treated as the frequency of the occurrence of an event and it is not related to the random sample that was obtained (Bolstad & Curran, 2016). This approach is not possible for stationary treatments such as a pivot irrigation systems because it cannot be separated into treatments and replications. For this reason, a different statistic approach is required. This method is known as Bayesian statistics, where the parameters are treated as random variables.

The analysis of data is based on the Bayes' theorem, which is a mathematical formula for conditional probabilities that describes the probability of an event occurrence based on a previous condition (Berrar, 2018). The Bayesian method helps us to solve complex models that are difficult to fit with normal methods, such as missing data, replication, and randomization (Blangiardo & Cameletti, 2015). It is calculated using the following formula:

$$P(A|B) = \frac{P(B|A) \cdot P(A)}{P(B)} \tag{2.3}$$

Where $P(A)$ is the probability of event A, $P(B)$ is the probability of B, $P(A|B)$ is the conditional probability of A given B, and $P(B|A)$ is the conditional probability of B given A.

2.8.1 Integrated Nested Laplace Approximation (INLA)

In the past, the Markov chain Monte Carlo method (Gilks, Richardson, & Spiegelhalter, 1995) was extensively employed for Bayesian inference. However, this method requires a high computational time. The results can take even days to be produced. To address this issue, Rue, Martino, and Chopin (2009) proposed the Integrated Nested Laplace Approximation (INLA) for the latent Gaussian Markov random field (GMRF) which represents a progress in Bayesian inference.

This method is a computational approach for performing approximate Bayesian inference, providing a accurate and higher computational speed for linear mixed and spatial and spatio-temporal models (Blangiardo & Cameletti, 2015). This approach has been used in different fields, including health-related studies such as HIV infection in Kenya (Tonui, Mwalili, & Wanjoya, 2018) and Chagas disease mortality in Brazil (Simões et al., 2018), as well as environmental-related studies, such as pollution (Samet, Dominici, Curriero, Coursac, & Zeger, 2000), climate change (Laurini, 2019).

The INLA analysis has three steps, the first step including the estimation of the posterior marginal distribution of θ by using the Laplace approximation. The second step, involves calculating the Laplace approximation, and the third step, while the third step combines the previous two steps by utilizing numerical integration. Different types of approximations can be found in Rue et al. (2009). The INLA analysis also opportunity to compare several models through cross-validation, the deviance information criterion (DIC), and Bayes factors. The INLA analysis can be assessed in R using the R-INLA package (Finn & Havard, 2015).

The latent GMRF model is a hierarchical model where the observations y are usually assumed to be conditionally independent given some latent parameters η, and some hyper-parameters θ_1, that is $\pi(y|\eta, \theta_1) = \prod_j \pi(y_j|\eta_j, \theta_1)$.

The latent parameters η are part of a larger latent random field x, which becomes in the the second step of the hierarchical model. The latent field x is modeled as a GMRF with precision matrix Q depending on some hyperparameters θ_2, that is $\pi(x|\theta_2) \propto \exp\left(-\frac{1}{2}(x-\mu)^T Q(x-\mu)\right)$. The last step of the model consist of the prior distribution for the hyperparameters $\theta = (\theta_1, \theta_2)$.

Chapter 3

Materials and Methods

In this chapter, we provide a overview of the study area, encompassing its principal climate conditions and soil characteristics. Additionally, we describe the different types of dataset utilized and the open-source databases from which we sourced them. Furthermore, we describe two different statistical approaches; machine learning and INLA analysis, employed to address our research questions. Along the project development, we used softwares such as R software (R Core Team, 2023), System for Automated Geoscientific Analyses (SAGA) (Conrad et al., 2015), and QGIS.

3.1 Study Site

This research covers an area of 3,400 ha, comprising 22 fields, 8 pivot-irrigated fields and 14 rainfed fields distributed on 6 farms between Hale, Marengo, Dallas, and Perry counties in Alabama, USA (Figure 3.1). Over the period from 2012 to 2021, the primary cultivation included two cash crops, soybeans and corn, along with a cover crop, winter wheat. These farms are located in a specific region known as the Blackland Prairie, that covers the eastern part of Mississippi as well as the central and western areas of Alabama (USDA & NRCS, 2022).

The soils in this area originated from calcareous sediments, including clay and sandy clay sediments. The calcareous deposit recognized as Selma Chalk and was formed around 60 millions years ago during the Cretaceous age. This calcium carbonate is composed of the remain of flagellate algae known as Coccolithophores, which settled to the ocean bottom and mixed with clays. Much of the region consists of grassland, however, certain parts of the region have experienced

severe erosion due to the intensive cotton production from 1850 to 1920 (Dixon & Nash, 1968). The Blackland Prairie is characterized by slopes less than 6%, with elevations ranging from 30 to 179 meters above sea level. The climate is classified as humid subtropical, with an average annual temperature ranging from 15 to 19 °C and average annual precipitation between 1,340 to 1,550 mm (USDA & NRCS, 2022).

Withing the study site, the prevalent soil orders include inceptisols and vertisols (Table A.1), with vertisols being the prevailing type. These vertisols exhibit optimal characteristics for crop production, featuring high chemical activity and fertility (Ahmad & Mermut, 1996) with a high clay content ranging between 30 to 80% (Ahmad, 1983).

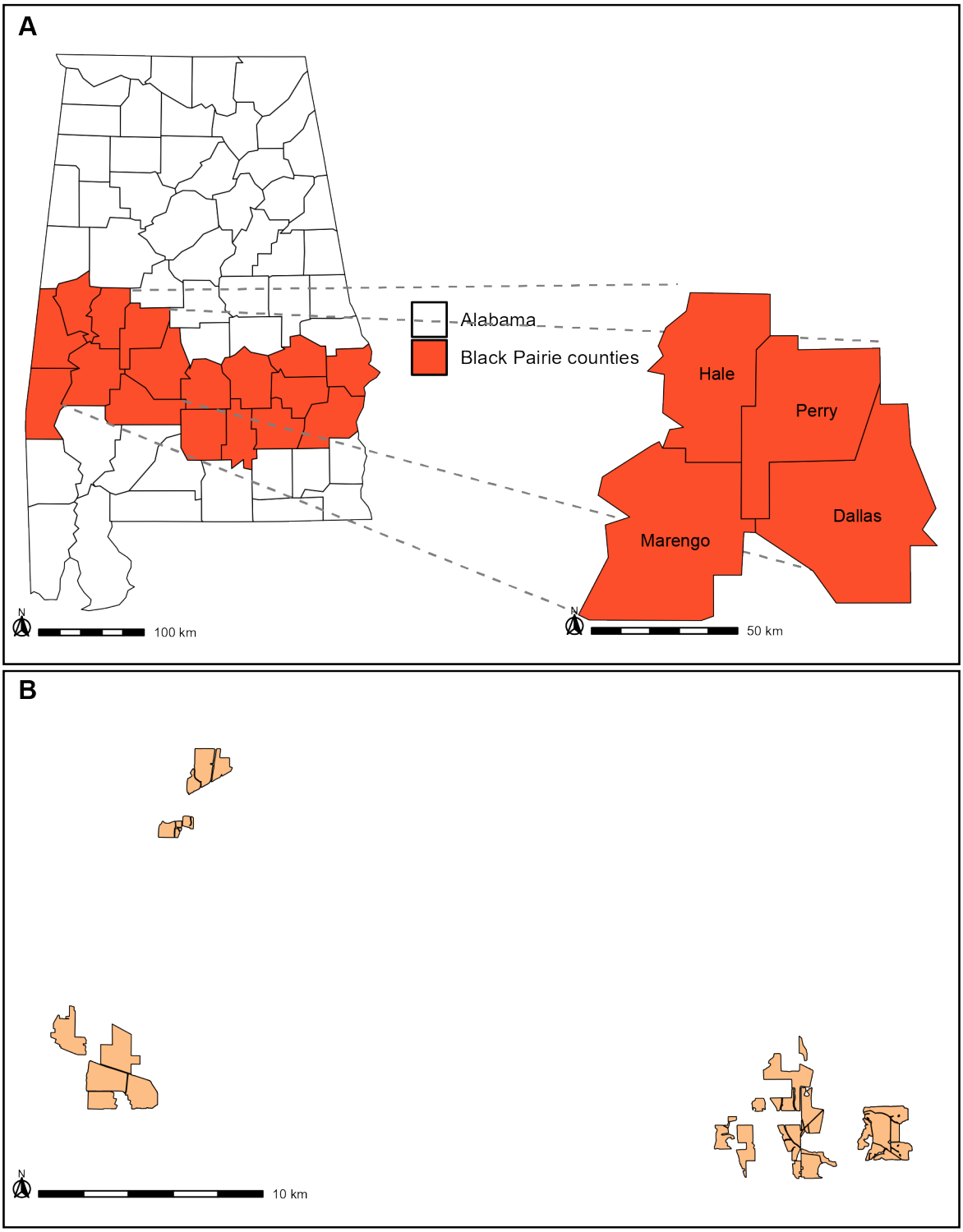

Figure 3.1: Map of Alabama with the the counties that comprise the Blackland Prairie Region and the counties where the fields of the study site are located (**A**). Fields of the study area (**B**)

3.2 Data Acquisition and Pre-process

3.2.1 Yield Data

A total of 183 yield data sets for corn (Table 3.1) and soybeans (Table 3.2) were acquired from 22 fields over a span of ten consecutive growing seasons (2012 to 2021) from a John Deere yield monitoring. Notably, during the collection of yield data, it has been documented that 10 to 50 % of significant errors may occur (Simbahan et al., 2004). Consequently, in order to eliminate them, a protocol established by Vega et al. (2019) was employed. The protocol follow four steps:

1. Removal of data points falling outside the maximum and minimum yield values. A minimum yield of 0.01 t/ha for corn and soybeans and a maximum yield of 18.5 t/ha for corn and 7 t/ha for soybeans were established. Those maximum values are the maximum yield values obtained in corn and soybean during the ten years. Also, to account for potential future yield increases, an additional 10% was included, and any values beyond this range were eliminated.

2. Creation of a buffer area extending 30 m from the field edges to eliminate the boundary effects.

3. Removal of global outliers: a mean of ±3 SD was established, and any data points outside this range were excluded.

4. Removal of local outliers: the Local Moran (LM) of spatial autocorrelation was used to determine local outliers with a neighbor of ≤ 40 m. Subsequently, these outliers were removed from the dataset.

Following the above protocol, the yield data points were converted to a raster format using a simple kriging method, defined as a spatial interpolation method that predicts an unknown value of interest by using the weighted average of known values following Tobler's first law of geography (Tobler, 1970), that specifies that all values that are closer to each other are more similar than those that are separated by a bigger distance (Miller, 2004).

Table 3.1: List of corn yield datasets from 2012 to 2021 from the study area. Fields in orange are irrigated.

Field	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
SP					x	x	x	x		x
AA				x	x	x	x		x	
JL						x	x		x	
CS			x	x	x	x	x	x		x
2PB							x		x	
1P							x		x	
MP										x
RD	x			x		x		x		
BS	x					x		x		x
AM				x	x	x	x	x	x	
HB					x	x	x	x		
CF		x	x			x	x		x	
6					x	x	x	x		
NH			x	x	x	x	x	x		
PB		x				x			x	
PLB		x			x	x	x		x	
PL		x		x	x	x	x		x	
BBEA					x	x	x	x		x
BG					x	x	x	x		x

Table 3.2: List of soybeans yield datasets from 2012 to 2021 obtained from the study area. Fields in orange are irrigated.

Field	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
SP	x	x	x	x					x	
AA		x	x					x		x
JL								x		x
CS	x	x							x	
2PB								x		x
1P								x		x
MP									x	
RD		x	x		x		x		x	x
BS		x	x	x	x		x		x	x
PTB		x	x	x	x		x	x	x	x
AM		x	x	x				x	x	x
HB		x	x	x	x		x	x	x	x
CF	x			x	x			x		x
PW							x	x		x
6		x	x	x					x	x
NH		x							x	x
PE							x	x		x
PB	x		x	x	x		x	x		x
PLB	x		x	x				x		x
PL	x		x	x				x		x
BBEA		x	x	x					x	
BG		x	x	x					x	

3.2.2 Terrain Data

Elevation data from the study area was obtained from the National Elevation Database (NED). All the DEMs were downloaded and adjusted to each field shape then reprojected into the WGS84/UTM16 coordinate system. After this process, the DEMs served as inputs for calculating thirty-three terrain derivatives to describe terrain characteristics within the study area using the System for Automated Geoscientific Analyses (SAGA) (Conrad et al., 2015) through R software (R Core Team, 2023).

List of terrain derivatives:

- Aspect: it is the direction of the slope, measured clockwise from 0 to 360, where 0 is north-facing, 90 is east-facing, 180 is south-facing, and 270 is west-facing (Travis, 1975).
- Plan Curvature: contour curvature (Wilson & Gallant, 2000).
- Slope: change in elevation over the terrain surface (Wilson & Gallant, 2000).
- Profile Curvature: curvature intersecting with the plane and maximum gradient direction (Wood, 1996).
- Tangential Curvature: plan curvature multiplied by slope (Wilson & Gallant, 2000).
- Maximum Curvature: maximum value of a curvature of a terrain surface (Wilson & Gallant, 2000).
- Minimum Curvature: minimum value of a curvature of a terrain surface (Wilson & Gallant, 2000).
- Maximum Membership: highest fuzzy membership value assigned to each pixel for any of the landform classes. It expresses the uncertainty of the classification (Schillaci, Braun, et al., 2015).
- Convergence Index: identify whether the water is moving towards a point or away (Conrad et al., 2015).

- Gradient Difference: quantify downslope controls on local drainage (Hjerdt, McDonnell, Seibert, & Rodhe, 2004).
- Topographic Position Index (TPI): measures where a location is in the landscape (Wilson & Gallant, 2000).
- TPI Based Landform classification: terrain classification based on the position in the terrain (Conrad et al., 2015)
- Slope Length: distance between each cell in a terrain surface and the nearest downslope cell (Wilson & Gallant, 2000).
- Normalized Height: vertical distance between each cell in a terrain surface and the lowest point in its surrounding area (Böhner & Selige, 2006).
- Standardized Height: normalized height multiplied with absolute height (Böhner & Selige, 2006).
- Valley Depth: difference between the elevation and a ridge level (Böhner & Selige, 2006).
- Terrain Surface Classification (Iwahashi and Pike): terrain classification based on slope gradient, surface texture, and convexity (Iwahashi & Pike, 2007).
- Relative Slope Position: measure of the position of each cell compared to the highest and lowest point within a moving window (Conrad et al., 2015).
- Total Catchment Area: area draining to catchment outlet (Wilson & Gallant, 2000).
- Channel Network: channel lines created from the water flow (Conrad et al., 2015).
- Channel Direction: direction of the channel (1-NE, 2-E, 3-SE, 4-S, 5-SW, 6-W, 7-NW, 8-N) (Conrad et al., 2015).
- Strahler Order: method of assigning a numerical order to each stream segment in a stream network based on its position and connectivity (Olaya, 2004).

- Channel Network Base Level: vertical distance of the interpolated channel network (Conrad et al., 2015).
- Specific Catchment Area: contributing area of each cell in a terrain surface to the water flow (Gruber & Peckham, 2009).
- LS Factor: combination of slope and slope length to measure the erosion potential (Novotny, 1994).
- Stream power Index: potential flow erosion at the given point of the topographic surface (Moore, Grayson, & Ladson, 1991).
- Topographic Wetness Index (TWI): soil moisture content of an area under steady-state conditions based on its topography and elevation (Gallant, 2000).
- Analytical hillshading: measures the amount of light that hits the surface on the ground and provide a representation of the topography (Horn, 1981).

3.2.3 Soil Data

Soil data for the study area was obtained from the National Soil Information System (NASIS) (Table A.1) and the POLARIS database, which provides information of soil series probabilities for the United States at 30 m resolution (Chaney et al., 2016). The information of the thirteen soil properties (Table 2.1) was available at different depths (0-5, 5-15, 15-30, 30-60, 60-100, 100-200 cm). A weighted average was calculated withing 0 to 60 cm depth to have a more uniform value. Additionally, we calculated the water content at field capacity (*theta_33*), water content at permanent wilting point (*theta_1500*), and the available water content (AWC).

3.2.4 Climate Data

Temperature, precipitation, and evapotranspiration data were used to calculate three drought indices. The first index, is the Palmer Drought Severity Index (PDSI) (W. Palmer, 1965), widely

used index to monitor long-term drought that requires prior historical temperature and precipitation data to estimate the drought in weeks. PDSI data was downloaded from the Parameter-elevation Regressions on Independent Slopes Model PRISM Climate Group; Oregon State University . Precipitation and temperature data spanning 1981-2021 were downloaded from the same data source to calculate the remaining drought indices. This index classifies drought in different categories, ranging from -10 (dry) to 10 (wet). Although, most of drought monitoring maps presented by drought monitoring agencies uses a range from -4 to 4 (Table 2.2).

The second index, is the Standard Precipitation Index (SPI) (McKee et al., 1993). It is a widely used meteorological drought index used to monitor precipitation deficiency and drought conditions across different time scales (1, 2, 3, 6, 9 and 12 months). SPI values ranges from -0.50 to -2.0 (Table 2.3). The index was calculated utilizing precipitation data using the "SPEI" package (Beguería & Vicente-Serrano, 2023) in R software (R Core Team, 2023).

The third index, is the Standardized Precipitation Evapotranspiration Index (SPEI) (Vicente-Serrano et al., 2010) which is a modification of the SPI and shares the same drought classification categories (Table 2.4). However, SPEI incorporates potential evapotranspiration. To compute this index, Potential Evapotranspiration (PET) and precipitation data are required. PET data from 2012 to 2021 was downloaded from the US Geological Survey (USGS) Famine Early Warning System Network (FEWS NET) data portal , while precipitation data used in previous index was employed. The "SPEI" package (Beguería & Vicente-Serrano, 2023) in R software (R Core Team, 2023) was required. The SPI and SPEI measured drought in a monthly time frame. Additionally, we calculated the atmospheric water deficit by calculating the difference between precipitation and potential evapotranspiration. Subsequently, cumulative drought indices for each growing season (April to September) were determined.

3.3 Statistical Analysis

3.3.1 Machine Learning

All datasets (yield, soil, terrain, and climate) were consolidated into a table, comprising 111,814 observations for corn and 100,109 observations for soybeans with 79 predictors at 30 m resolution. Four different machine learning algorithms were evaluated; Support Vector Machine (SVM), Elastic Net Regression (ENR), Stepwise Regression (SR) and Random Forest (RF). To enhance model accuracy, all variables except for yield were transformed (centered and scaled) for SVM, ENR or SR, but not for RF. To avoid overfitting the models were tuned using ten-fold cross-validation as general resampling approach and the variable importance was calculated to determine which were the variables with the highest effect in crop yield predictions (Kuhn et al., 2013). Usually researchers split their data in 70 or 80% to use it as training and 30 or 20% to use it as validation. Conversely, we did not divided our data based on those parameters, we created different scenarios to test our hypotheses and to have better data management on a field scale. Those scenarios were created under the following aspects:

- Yield predictions based on adjacent fields with the same water management: this assessment was named as group A (Figure 3.2). To create these scenarios, two fields with the same water management, the same crop, and year were used. Data from one field was used as training, and data from the other field was used as validation. In total, 1182 scenarios were created, comprising 488 scenarios for corn and 694 scenarios for soybeans.

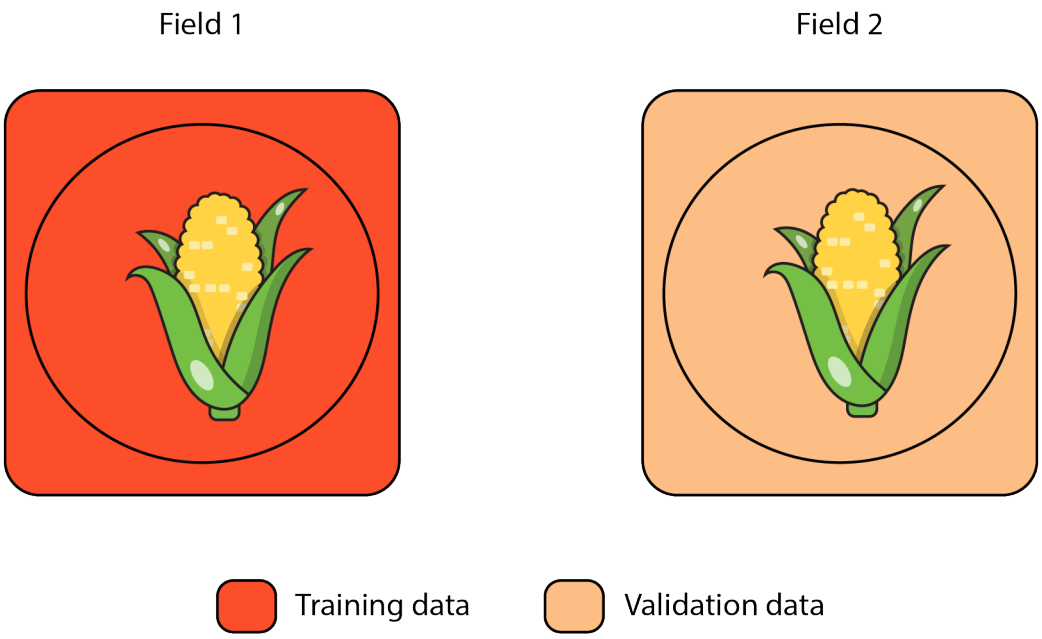

Figure 3.2: Graphic representation of the scenarios created in group A

- Yield predictions within irrigated fields: this assessment was named as group B (Figure 3.3). To create these scenarios, just the irrigated fields were used. We selected two fields with the same crop and the same year, but we made a slightly change compared to the previous group. To understand this group, it is important to highlight that when there is a pivot irrigation system on a field, there are areas under the pivot that are irrigated and areas outside the diameter of the central pivot that are not irrigated. Afterwards, we selected all the data (irrigated and non-irrigated areas) from one field to use if as the training field. In the remaining field, we separated the data, irrigated and the non irrigated. The non-irrigated areas were included in the training dataset and the irrigated areas were used as validation. In total, 96 scenarios were created, comprising 62 scenarios for corn and 34 scenarios for soybeans.

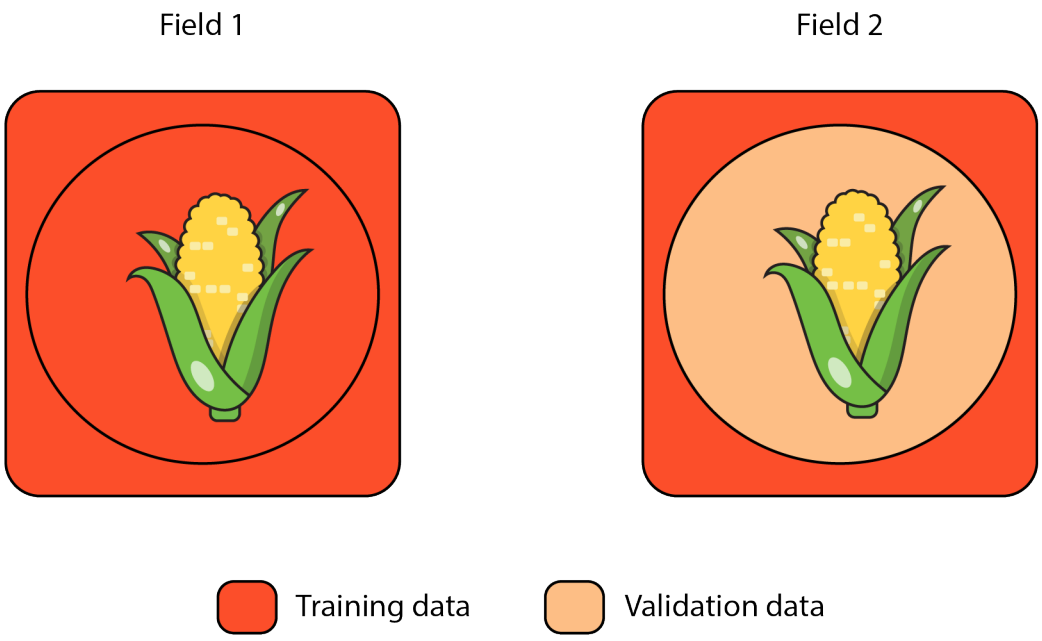

Figure 3.3: Graphic representation of the scenarios created in group B

- Yield prediction for a specific year utilizing data from other years within the same field: this assessment was named as group C (Figure 3.4). To create these scenarios the same field was used as training and validation. The data from the field was separated into training and validation, where one year was selected as validation and the remaining years as training. This process was repeated until all years from every field were used as validation. The field needed more than two year of yield data of the same crop to create the scenarios. In total, 178 scenarios were created, comprising 81 scenarios for corn and 97 scenarios for soybeans.

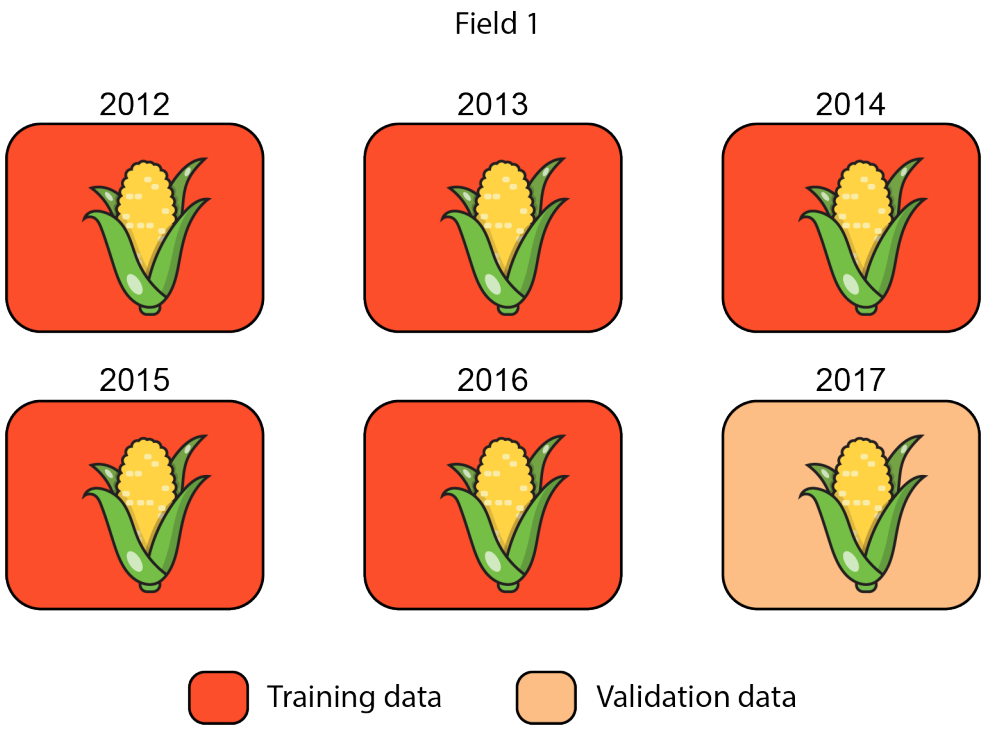

Figure 3.4: Graphic representation of the scenarios created in group C

- Yield prediction of one field for an specific year and crop using other fields with crop production in other years: this assessment was named as group D (Figure 3.5). To create these scenarios, fields with the same water management were used. First, we selected one field, then we determined one year and the crop in that year. We call them ”validation field”, ”validation crop”, and ”validation year”, respectively. After that, in the ”validation field”, we identified and selected all the ”other years”, with crop production different from the ”validation crop” (i.e., if we selected corn in the validation field, now we need to select soybeans and vice versa). For the training, we found all other fields that have the same ”validation crop” in the ”validation year”. We call those fields as ”other fields”. Then, we selected from the ”other fields” data in the same years as ”other years” from the validation field regardless the crop. Finally, we compiled all the data from ”other years” from the validation, data from ”other fields” with data in ”other years” in one dataset and created the training data. In total, 153 scenarios were created.

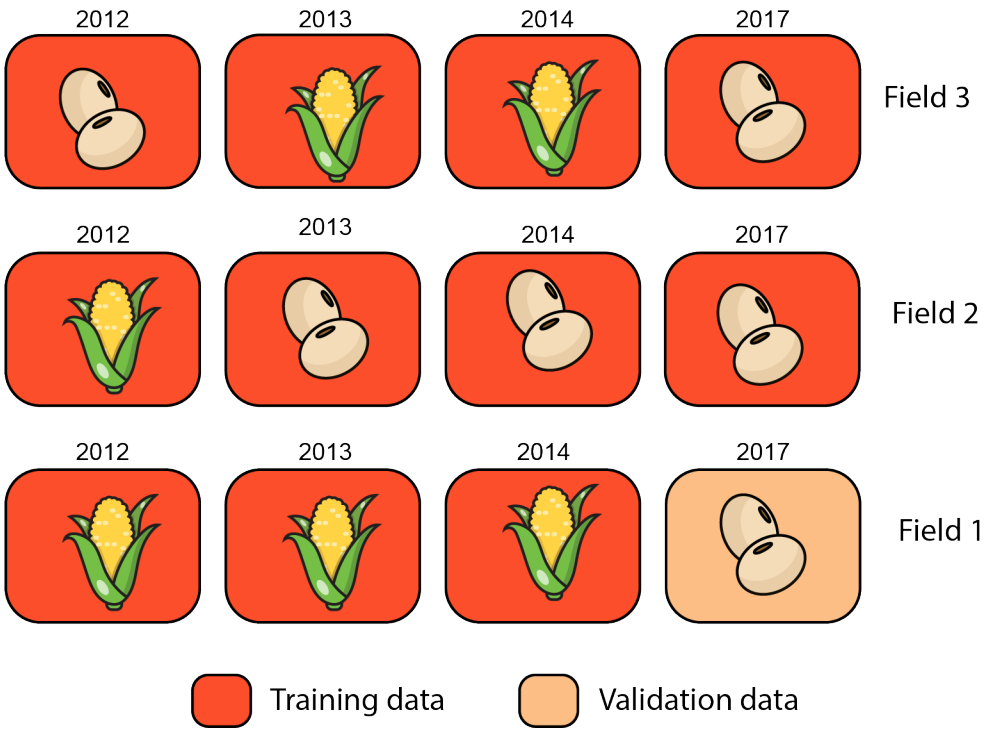

Figure 3.5: Graphic representation of the scenarios created in group D

After creating the scenarios, the next step was to evaluate the machine learning algorithms to make the predictions. The predictions were performed in R software (R Core Team, 2023) using a general package called "caret" (Kuhn & Max, 2008), supplemented by additional packages specific to each model. Packages such as "dplyr" (Wickham, François, Henry, Müller, & Vaughan, 2023) was used in RF, SVM, and ENR, "ranger" package (Wright & Ziegler, 2017) was used in RF and SVM, "e1071" package (Meyer, Dimitriadou, Hornik, Weingessel, & Leisch, 2023) was used in RF and SVM, "tiyverse" package (Wickham et al., 2019) was used in SVM and SR, "kernlab" package (Karatzoglou, Smola, Hornik, & Zeileis, 2004) was used in SVM, "glmnet" package (Tay, Narasimhan, & Hastie, 2023) was used in ENR, "leaps" (based on Fortran code by Alan Miller, 2020) and "MASS" packages (Venables & Ripley, 2002) were used in SR.

To increase the computational time efficiency we developed this work in part with resources provided by the Auburn University Easley Cluster. This super computer has a system system with high computing resources that allow scientist to perform and accelerate research analysis in parallel

computing. The process of big datasets is time consuming, in our case, the amount of scenarios created and the amount of observations per scenarios was relatively high in some groups, resulting in several days of computation. For this reason, we performed our analysis in the Easley cluster. In the cluster, 30 scenarios run in parallel at the same time. Additionally, we established a wall time of 10 days for conducting each scenario. The scenarios that were unable to complete the predictions within this time frame were excluded.

Model Evaluation and Selection

The comparative evaluation of model performance in every group involved the calculation of different metrics such as the Root Mean Square Error (RMSE) (Equation 3.1), the coefficient of determination (R^2) (Equation 3.2), and Mean Absolute Error (MAE) (Equation 3.3).

- Root Mean Squared Error (RMSE): measures the differences between the predicted and the real values. It is the standard deviation of the predicted errors.

$$RMSE = \sqrt{\frac{1}{n}\sum_{j=1}^{n}(y_j - \hat{y}_j)^2} \tag{3.1}$$

  Where y_j is the predicted value, $\hat{y}_j$ is the observed value.

- Coefficient of determination (R^2): explains the proportion of the variation explained by the model.

$$R^2 = 1 - \frac{RSS}{TSS} \tag{3.2}$$

  Where *RSS* is the sum of squares of residuals and *TSS* is the total sum of squares.

- Mean Absolute Error (MAE): measures the deviation of predicted values from real values.

$$MAE = \sum_{i=1}^{D} |x_i - y_i| \tag{3.3}$$

The initial filter to evaluate the performance of each scenario was to calculate the prediction error. To achieve this, the mean yield for each field per crop and year was calculated, then we evaluated which percentage of the total yield the RMSE of the predicted yield in each scenario represents. Scenarios exhibiting an error percentage of higher than 100% were eliminated.

Following the first filter, we calculated the distance between every field used for training and validation in group A and B to study its relationship with the RMSE of each scenario withing the groups. Additionally, the number of observations in the training and the validation datasets for each scenario within the groups were estimated to study its relationship with the RMSE of the scenarios. A one-way ANOVA test was performed to evaluate the RMSE means of the scenarios per model within each group. In models where significant results ($p < 0.05$) were found, a post hoc Tukey's Honest Significant Difference test was conducted. Finally, we calculated the measure explanatory variable importance for the scenarios with the lowest RMSE per crop withing the model the performed better in each group. This measurement was used to identify the variables with the most significant impact on crop yield prediction.

To have a better understanding of the machine learning approach to predict corn and soybeans yield, a framework was created to describe the steps followed (Figure 3.6).

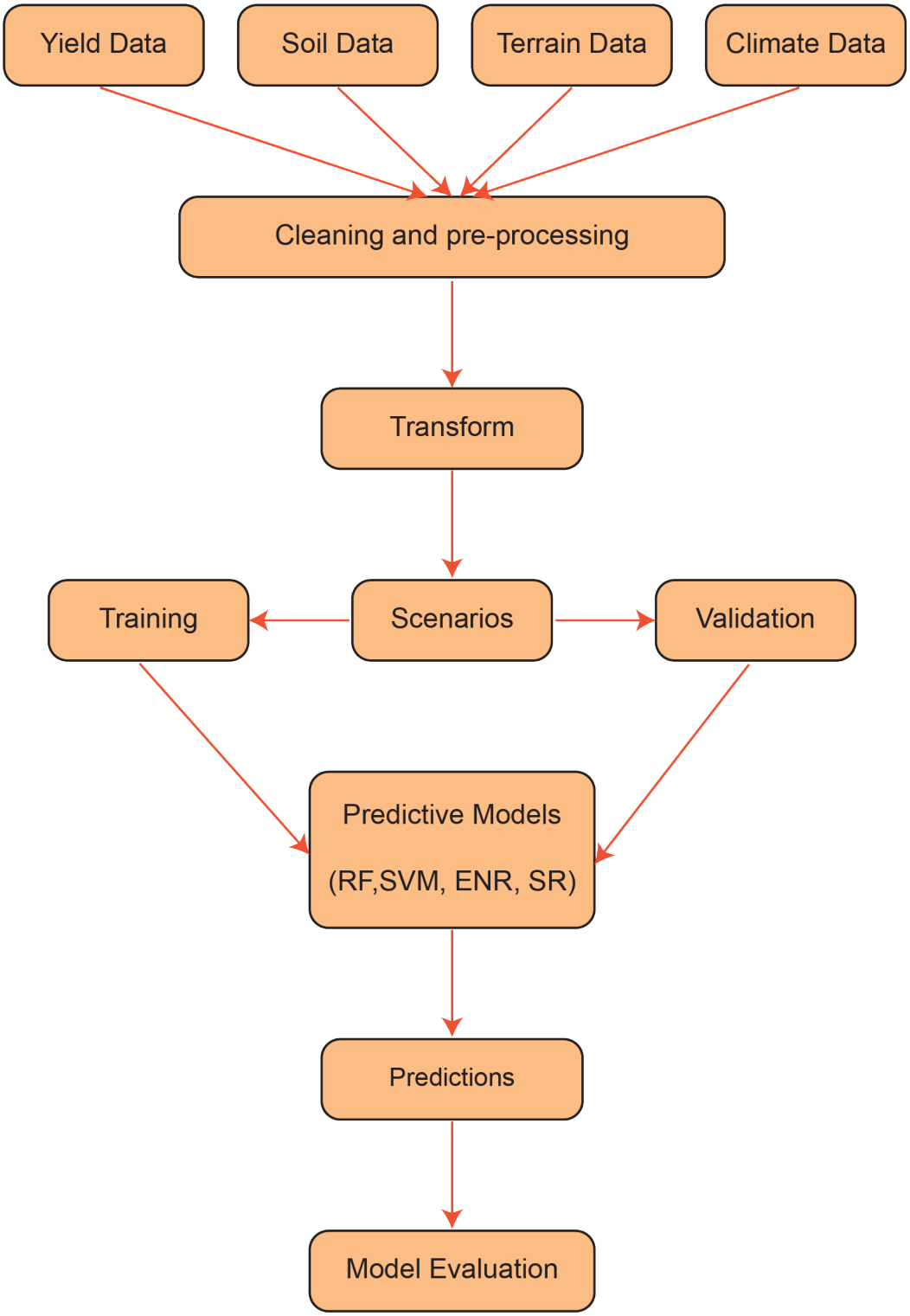

Figure 3.6: Workflow developed to predict crop yield.

3.3.2 Integrated Nested Laplace Approximation (INLA)

Spatial variation is common across agricultural fields. There are several factors that can produced this variation such as the soil characteristics, water movement, or soil fertility. It directly affects the performance and develop of crops, causing areas of high and low yields. Traditionally, this variation is estimated using plot scale experiment with different treatments and replications, but these approaches does not account for all the spatial variability.

This is not possible for on-farm irrigation research where we have a stationary treatment (pivot) that will never change the location or will be separated by treatments. Conversely, we just have the irrigated area inside the pivot and the non-irrigated areas outside the pivot. For this reason, we cannot use classical statistics, instead, we used Bayesian statics that allow us to be more flexible with the randomness of our analyses. The Integrated Nested Laplace Approximation (INLA) was first introduced by Rue et al. (2009). This method is easy to implement in R through the "R-INLA" package (Finn & Havard, 2015).

For this analysis just irrigated fields were used. Using soil, terrain variables, and water management covariables. In total we used 58 covariables. The yield effect was evaluated with just the addition of irrigation, as well as the addition of each covariable per time. The INLA calculation was based on 10,000 observations per field and year. We evaluated different models throughout each covariable.

To select the bests models INLA has different criteria such as marginal likelihood, Conditional Predictive Ordinate (CPO), Predictive Integral Transform (PIT), Deviance Information Criterion (DIC), and Widely Applicable Bayesian Information Criterion (WAIC) (Gómez-Rubio, 2020). In our analysis we based our model selection in each covariable in the Deviance information criterion (DIC), this criterion takes into account the best fit and a penalty based on the complexity of the model. The models with lower DIC means that values are better. The INLA analysis includes a variety of random and fixed effects. When including a covariable to the model, they account as a linear fixed effect that affect all observations in the same way. On the other hand, the random

effects are included to take into account variation attributed to variables that are included in the model but are not our target variable.

Regarding the random effects, there are several that can be included in the analysis, in our case we just included the Independent and identically distributed Gaussian random effect (idd) and the Autoregressive model of of order p called as AR(p). For instance, the first model implemented was the standard model, the second, was the correlated random effects (idd) that adds a random effect to the formula, and the autoregressive models of order 1 up to 10 (i.e, AR1, AR2...AR10), as well as the combination of the correlated random effects (idd) with the autoregressive model of order 1 to order 10 (i.e, random-AR1, random-AR2...random-AR10). Resulting in a total of 22 models evaluated for each covariable.

The formulas created for every model are described as follows:

- Standard Model:

$$\text{yield.t.ha} \sim 1 + \text{irrigation} \tag{3.4}$$

  Where *yield.t.ha* is the response variable, *1* represents the intercept of the model, and *irrigation* represents the variable predictor.

- Random Effect Model with iid:

$$\text{yield.t.ha} \sim 1 + \text{irrigation} + f(\text{Id3}, \text{model} = \text{"iid"}, \text{graph} = \text{y.adj}) \tag{3.5}$$

  Where *yield.t.ha* is the response variable, *1* represents the intercept of the model, *irrigation* represents the variable predictor, *Id3* represents the ID column to use for 2nd spatial process, *iid* adds the spatial random effect, and *y.adj* identify location to save it in a graph file.

- Autoregressive (AR) Models:

$$\text{yield.t.ha} \sim 1 + \text{irrigation} + f(\text{Id2}, \text{model} = \text{"ar"}, \text{order} = p, \text{graph} = \text{y.adj}) \tag{3.6}$$

Where *yield.t.ha* is the response variable, *1* represents the intercept of the model, *irrigation* represents the variable predictor, *Id2* represents the ID column to use for 1st spatial process, and *y.adj* identify location to save it in a graph file.

- Autoregressive (AR) Models + Random effect:

$$\text{yield.t.ha} \sim 1 + \text{irrigation} + f(\text{Id2}, \text{model} = \text{"ar"}, \text{order} = p, \text{graph} = \text{y.adj}) + f(\text{Id3}, \text{model} = \text{"iid"}, \text{graph} = \text{y.adj}) \quad (3.7)$$

Where *yield.t.ha* is the response variable, *1* represents the intercept of the model, *irrigation* represents the variable predictor, *Id2* represents the ID column to use for 1st spatial process, *Id3* represents the ID column to use for 2nd spatial process, *iid* adds the spatial random effect, and *y.adj* identify location to save it in a graph file.

Upon evaluating all the models, we excluded the yield effect that exceeded the maximum yield achieved in each field and year from 2012 to 2021 for both corn and soybeans. Calculations were performed based on the maximum yield obtained per field, year, and crop. Any yield effects with errors over 100% or below -100% were excluded from the analysis. Then, we choose the model that had the lowest DIC value for each covariate. In addition, to conduct a more detail evaluation of the covariables, specifically chose 10 covariables with the lowest per each crop and visually represented them on maps.

3.4 Economic Analysis

Irrigation is widely used as a management practice to control drought conditions and improve yield performance in agricultural fields. The effect of this irrigation might vary according to the location, climate, soil and terrain characteristics, among others. As mentioned before, in our study area, the inherent characteristics of the soils make them very unique when dealing with management practice, that differentiate from other areas. Over the years, differences in yield from the irrigated

fields and non-irrigated fields for corn and soybeans production where minimum, even obtaining higher yields in non irrigated fields, than in irrigated fields in some years.

Due to those minimum differences, we decided to implement an economic analysis to determine the profitability of investing in a pivot irrigation system in the study area. The analysis was performed using the information of the irrigated fields. The data of those fields was separated in two categories; "irrigated", for the areas under the pivot, and "not-irrigated" for the areas outside the pivot.

To determine the profitability of the pivot irrigation system in the study area we followed few steps. First, we calculated the income. We selected the model with the lowest DIC in the crop yield response with the addition of irrigation as a covariable from the INLA analysis. Then, we multiplied it by the commodities mean prices of corn and soybeans from 2012 to 2021 (Corn = 171.64 $/ha and Soybeans = 397.49 $/ha) (Table 3.3) obtained from the National Agricultural Statistics Service (NASS). Additionally, we obtained the total annual cost of three different cases of irrigation systems from the Alabama Cooperative Extension System. Finally, we calculated the net income, where we extracted the total annual cost of the three different cases from the income produced in each year per crop.

Those cases from the Alabama Cooperative Extension System have different characteristics; water source, pivot length, power source which result in different annual costs. Case 1, was a center pivot of 400 m length, electric powered and pond as a source of water with a total annual cost of 511 $/ha. Case 2, was a center pivot of 400 m length, electric powered, well as a source of water with a total annual cost of 344 $/ha. Case 3, was a center pivot with 350 m length, diesel powered, pond as a source of water with a total annual cost of 423 $/ha.

Table 3.3: Commodities prices from 2012 to 2021.

Year	**Crop**	**Price [$/ha]**
2012	Corn	262.58
2012	Soybeans	514.41
2013	Corn	242.11
2013	Soybeans	518.09
2014	Corn	161.80
2014	Soybeans	446.44
2015	Corn	146.05
2015	Soybeans	348.70
2016	Corn	137.00
2016	Soybeans	345.02
2017	Corn	132.28
2017	Soybeans	345.02
2018	Corn	136.61
2018	Soybeans	336.20
2019	Corn	147.63
2019	Soybeans	309.75
2020	Corn	137.79
2020	Soybeans	329.96
2021	Corn	212.59
2021	Soybeans	481.34

Chapter 4

Results and Discussion

In this chapter, we provide the results and discussion of the effect of soil, terrain, and climate variables on crop yield as well as the variables with the highest effect on crop yield from two different statistical approaches used in our study; Machine learning and Integrated Nested Laplace Approximation (INLA). In addition, we evaluated the profitability of a pivot irrigation system from 2012 to 2021 in the study site.

4.1 Machine Learning

In this statistical approach, we select the best performing machine learning algorithm in each group, we study the relationship of the distance between training and validation datasets with RMSE and the relationship of the number of variables between training and validation datasets with mean RMSE. Also, we calculate the variable importance plots to determine which are the variables with the highest effect in crop yield predictions on the scenarios with the lowest RMSE within the groups.

4.1.1 Model Selection

After all the models were evaluated, we eliminated the scenarios that exhibited an error percentage $>100\%$ or scenarios that encountered processing errors and never finished. In group A, a total of 1182 scenarios, 488 scenarios for corn and 694 scenarios for soybeans across all models were computed. The selection percentages for each model within this group were outlined as follows:

RF 94.59% , SVM 94.16% , ENR 79.10%, and SR 59.39%. In group B, a total of 96 scenarios, including 62 scenarios for corn and 34 scenarios for soybeans across all models were computed, with selection percentages distributed as follows: RF, SR, SVM, and ENR 100.00%. In group C, a total of 178 scenarios, 81 scenarios for corn and 97 scenarios for soybeans across all models were computed, with selection percentages as follows: RF and SVM 94.38%, ENR 89.32%, and SR 69.10%. In group D, a total of 153 scenarios, 74 scenarios for corn and 79 scenarios for soybeans across all models were computed, with selection percentages as follows: RF 100.00%, SVM and ENR 96.73%, and SR 92.81%.

Upon eliminating the predictions that exceeded an error threshold of 100%, summary statistics were computed to asses the differences in mean RMSE as well as the relative error from the predictions regarding the mean yield per crop among the models evaluated in every group. The mean yield for corn and soybeans from 2012 to 2021 are 10.10 and 3.2 t/ha, respectively.

For group A, in corn yield predictions, RF and SVM were the models with the highest number of assessed scenarios, although RF achieved the lowest mean RMSE of 2.72 t/ha and the lowest relative error of 0.27 t/ha. In soybeans, RF exhibited both the highest number of assessed scenarios and the lowest RMSE of 1.35 t/ha, although the relative error of 0.42 t/ha was the same as SVM. (Table 4.1).

Table 4.1: Mean RMSE and SD from the selected scenarios of Elastic Net Regression, Random Forest, Stepwise Regression and Support Vector Machine in group A for corn and soybeans yield predictions.

Crop	**Model**	**Count**	**Mean RMSE [t/ha]**	**SD**	**Relative error**
Corn	ENR	450	3.74	1.95	0.37
	RF	485	2.72	1.07	0.27
	SR	361	3.93	1.99	0.39
	SVM	486	2.81	1.06	0.28
Soybeans	ENR	485	1.59	0.75	0.50

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Crop	Model	Count	Mean RMSE [t/ha]	SD	Relative error
	RF	633	1.35	0.61	0.42
	SR	341	1.62	0.76	0.50
	SVM	627	1.37	0.59	0.42

In group B, for both corn and soybeans yield predictions, RF and SR were the models with the highest amount of scenarios assessed, but RF achieved the lowest mean RMSE of 2.25 and 0.82 t/ha for corn and soybeans respectively, as well as the lowest relative error of 0.22 and 0.26 t/ha for corn and soybeans respectively (Table 4.2).

Table 4.2: Mean RMSE and SD from the selected scenarios of Elastic Net Regression, Random Forest, Stepwise Regression and Support Vector Machine in group B for corn and soybeans yield predictions.

Crop	Model	Count	Mean RMSE [t/ha]	SD	Relative error
Corn	ENR	62	2.27	0.50	0.23
	RF	62	2.25	0.58	0.22
	SR	62	2.31	0.53	0.23
	SVM	62	2.35	0.49	0.23
Soybeans	ENR	34	0.86	0.23	0.27
	RF	34	0.82	0.20	0.26
	SR	34	0.87	0.25	0.27
	SVM	34	0.87	0.18	0.27

In group C, for corn yield predictions, RF, ENR, and SVM were identified as the models with the highest number of scenarios assessed, with ENR achieving the lowest mean RMSE of 1.51 t/ha and the lowest relative error of 0.15 t/ha. Similarly, in soybeans yield predictions, ENR was the model with the highest number of scenarios assessed, the lowest mean RMSE of 0.54 t/ha, and the lowest relative error of 0.17 t/ha. (Table 4.3).

Table 4.3: Mean RMSE and SD from the selected scenarios of Elastic Net Regression, Random Forest, Stepwise Regression and Support Vector Machine in group C for corn and soybeans yield predictions.

Crop	Model	Count	Mean RMSE [t/ha]	SD	Relative error
Corn	ENR	79	3.13	1.40	0.31
	RF	81	2.74	0.92	0.27
	SR	60	3.53	1.70	0.35
	SVM	81	2.88	0.98	0.28
Soybeans	ENR	80	1.30	0.63	0.40
	RF	87	1.18	0.55	0.36
	SR	63	1.31	0.76	0.40
	SVM	87	1.19	0.56	0.37

In group D, for corn yield predictions, RF , SVM, and ENR were identified as the models with the highest number of scenarios assessed, but RF had lowest mean RMSE of 0.71 t/ha and the lowest relative error of 0.07 t/ha. In soybeans, RF was the model with the highest amount of scenarios assessed with the lowest mean RMSE of 0.23 t/ha and the lowest relative error of 0.07 t/ha (Table 4.4).

Table 4.4: Mean RMSE and SD from the selected scenarios of Elastic Net Regression, Random Forest, Stepwise Regression and Support Vector Machine in group D for corn and soybeans yield predictions.

Crop	Model	Count	Mean RMSE [t/ha]	SD	Relative error
Corn	ENR	74	2.27	0.97	0.22
	RF	74	0.71	0.91	0.07
	SR	67	1.91	0.48	0.19
	SVM	74	2.27	0.97	0.22
Soybeans	ENR	74	1.19	0.39	0.36

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Crop	Model	Count	Mean RMSE [t/ha]	SD	Relative error
	RF	79	0.23	0.05	0.07
	SR	75	0.81	0.19	0.25
	SVM	74	1.19	0.39	0.36

After observe the differences within the models, an one-way ANOVA and a post-hoc Tukey's Honest Significant Difference test were conducted to select the best performing model in each group. Overall, we found across groups A, B, C, and D statistical significant differences among the models ($p < 0.01$) in corn (Table 4.5) and soybeans (Table 4.6) yield predictions.

Table 4.5: One-way ANOVA results: Determine the differences of mean RMSE between Random Forest, Support vector Machine, Elastic Net Regression, and Stepwise Regression in corn yield predictions.

	Group A	Group B	Group C	Group D
Observations (n)	1782	247	300	288
Degrees of Freedom (DF)	3	3	3	3
Standard error	1.540686	0.5268145	1.255616	0.8628373
F-statistics	70.68	0.399	5.244	53.9
p-value	$<2 \times 10^{-16}$	0.754	0.00154	$<2 \times 10^{-16}$

Table 4.6: One-way ANOVA results: Determine the differences of mean RMSE between Random Forest, Support vector Machine, Elastic Net Regression, and Stepwise Regression in soybeans yield predictions.

	Group A	Group B	Group C	Group D
Observations (n)	2086	135	316	301
Degrees of Freedom (DF)	3	3	3	3
Standard error	0.665583	0.2170902	0.619894	0.2906796

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	Group A	Group B	Group C	Group D
F-statistics	22.63	0.386	0.992	184.6
p-value	2.04×10^{-14}	0.763	0.397	$<2 \times 10^{-16}$

In group A, RF and SVM were not statistically different from each other, but they were significant different from ENR and SR. On the contrary, ENR and SR did were not significant different between them, but they were significant different from RF and SVM for both corn (Figure 4.1A) and soybeans (Figure 4.1B) yield predictions.

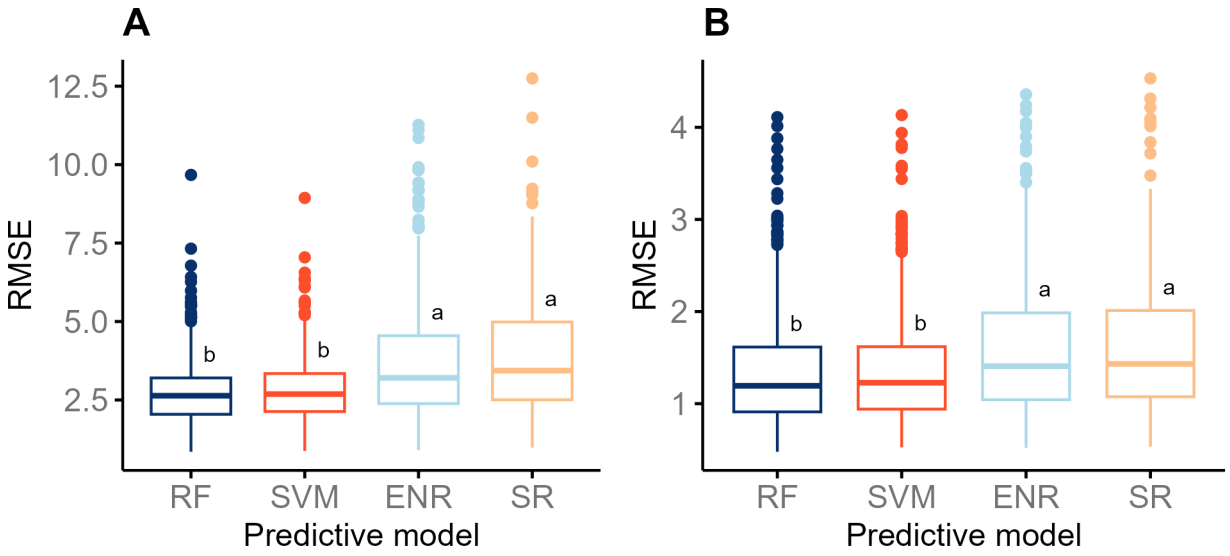

Figure 4.1: Box plot with standard error of mean RMSE of Random Forest, Support vector Machine, Elastic Net Regression, and Stepwise Regression in corn (**A**) and soybeans (**B**) in group A. Models with different letters are significantly different ($p < 0.05$) as determined by a post-hoc Tukey's Honest Significant Difference test.

For group B, in both corn (Figure 4.2A) and soybeans yield predictions (Figure 4.2B) not statistically significant differences were found between all the models.

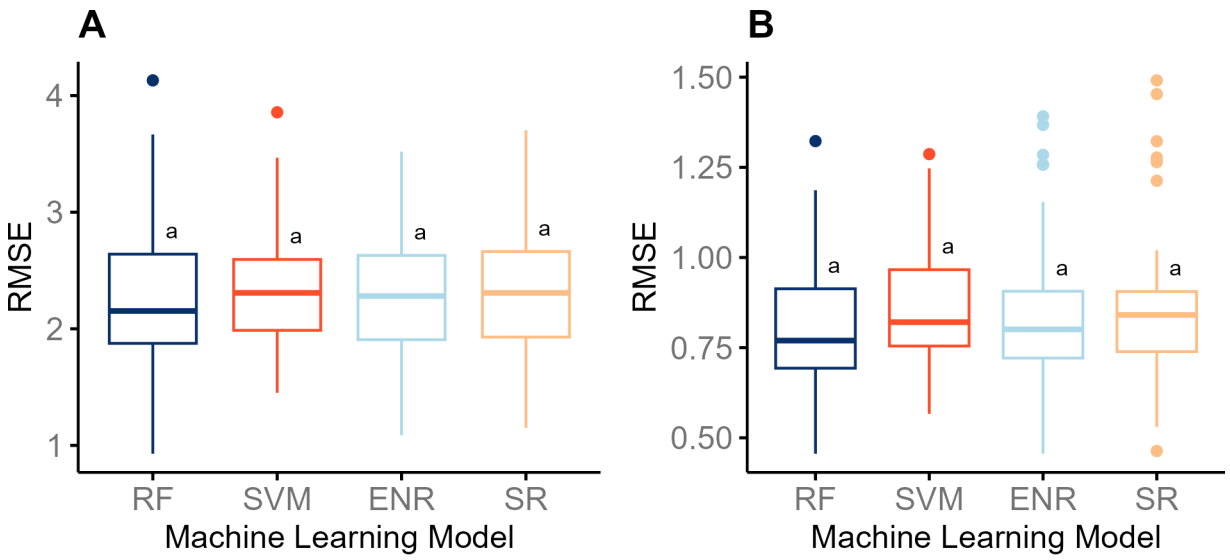

Figure 4.2: Box plot with standard error of mean RMSE of Random Forest, Support vector Machine, Elastic Net Regression, and Stepwise Regression in corn (**A**) and soybeans (**B**) in group B. Models with different letters are significantly different ($p < 0.05$) as determined by a post-hoc Tukey's Honest Significant Difference test.

In group C, in corn yield predictions (Figure 4.3A), ENR was not statistically significant different from RF, SVM, and SR. SR was statistically significant different from RF, SVM, and ENR. Also, RF and SVM were not statistically significant different between them. In soybeans yield predictions (Figure 4.3B) not statistical significant differences were found between all the models.

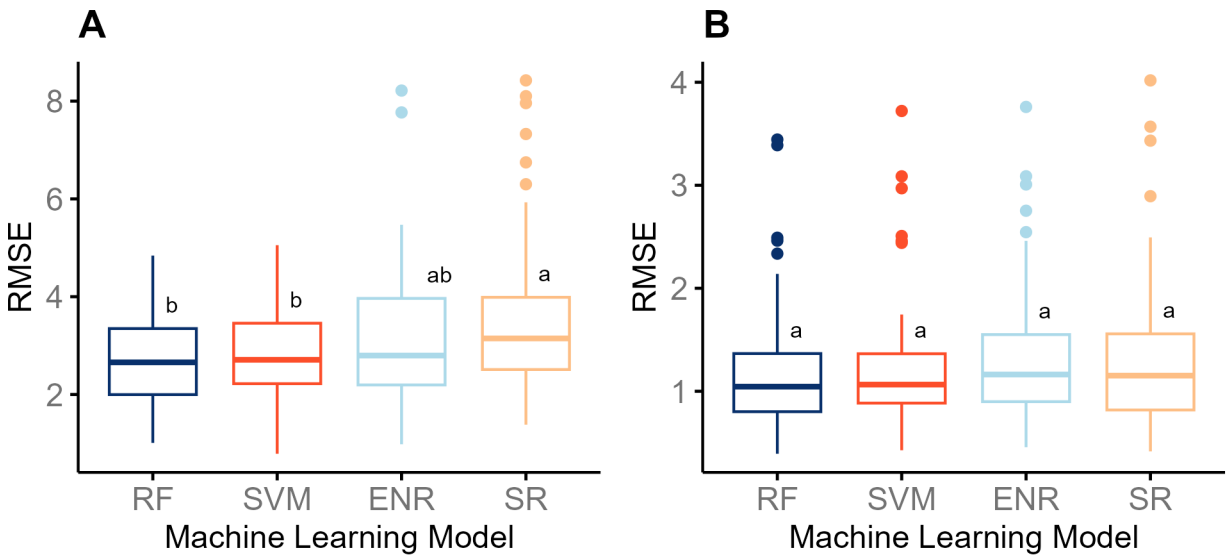

Figure 4.3: Box plot with standard error of mean RMSE of Random Forest, Support vector Machine, Elastic Net Regression, and Stepwise Regression in corn (**A**) and soybeans (**B**) in group C. Models with different letters are significantly different ($p < 0.05$) as determined by a post-hoc Tukey's Honest Significant Difference test.

In group D, in corn yield predictions (Figure 4.4A), SVM, ENR, and SR were not statistically significant different between them, but RF was statistically significant different between them. In soybeans yield predictions (Figure 4.4B), SVM and ENR were not statistically significant different between them, but they were statistically significant different from SR and RF.

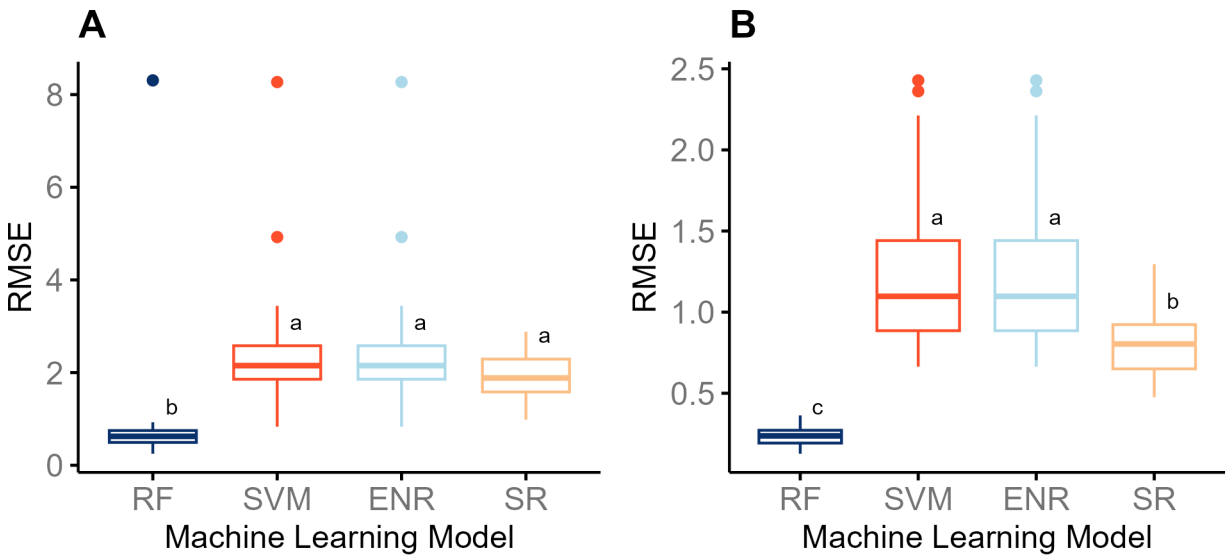

Figure 4.4: Box plot with standard error of mean RMSE of Random Forest, Support vector Machine, Elastic Net Regression, and Stepwise Regression in corn (**A**) and soybeans (**B**) in group D. Models with different letters are significantly different ($p < 0.05$) as determined by a post-hoc Tukey's Honest Significant Difference test.

4.1.2 Distance and Prediction Accuracy

Each scenario within groups A and B used different fields as training and validation datasets. Consequently, we performed a linear regression analysis to explore the correlation of the distance between the training and validation fields with the mean RMSE in crop yield predictions. However, we did not assess the analysis within group C, because the same field was used for both training and validation. In group D, the training dataset included data from several fields and years with different distances from the validation field, making it more challenging to measure the influence of distance and the model accuracy. Random Forest was the model selected from group A and group B for corn and soybeans yield predictions.

In group A, significant positive relationships were observed between distance and RMSE for both corn ($p< 0.01$) (Figure 4.5A) and soybean yield predictions ($p< 0.01$) (Figure 4.5B).

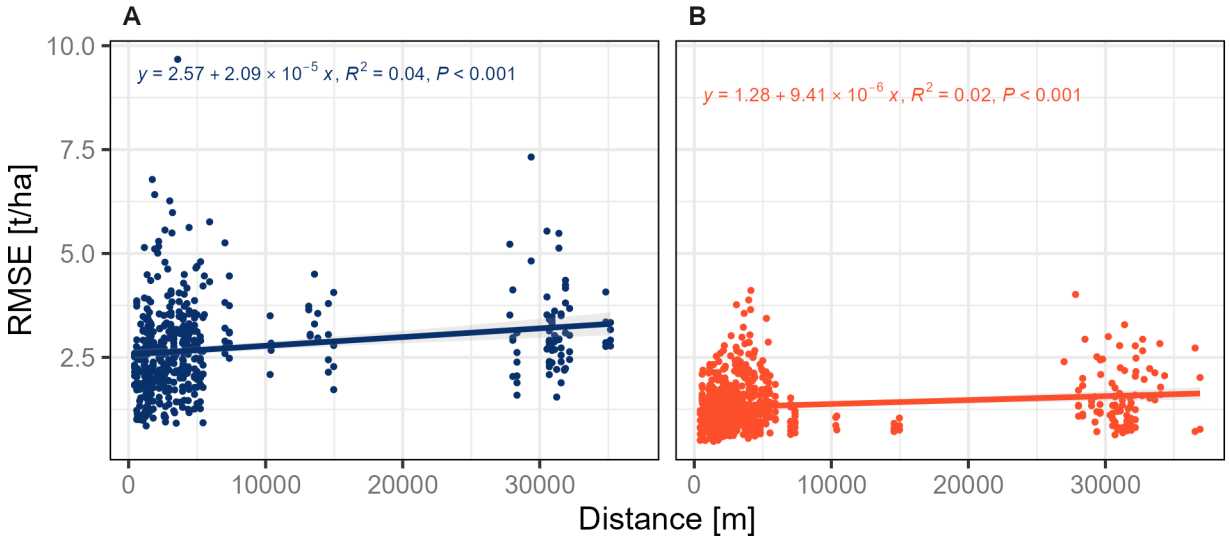

Figure 4.5: Linear regression of the distance between the training and the validation fields and the RMSE of Random Forest in corn (**A**) and soybeans (**B**) in group A.

In group B, no statistical significant relationship was found between distance and RMSE for corn yield prediction ($p > 0.05$) (Figure 4.6A), but in soybeans yield prediction a statistical significant relationship was found between distance and RMSE ($p < 0.05$) (Figure 4.6B).

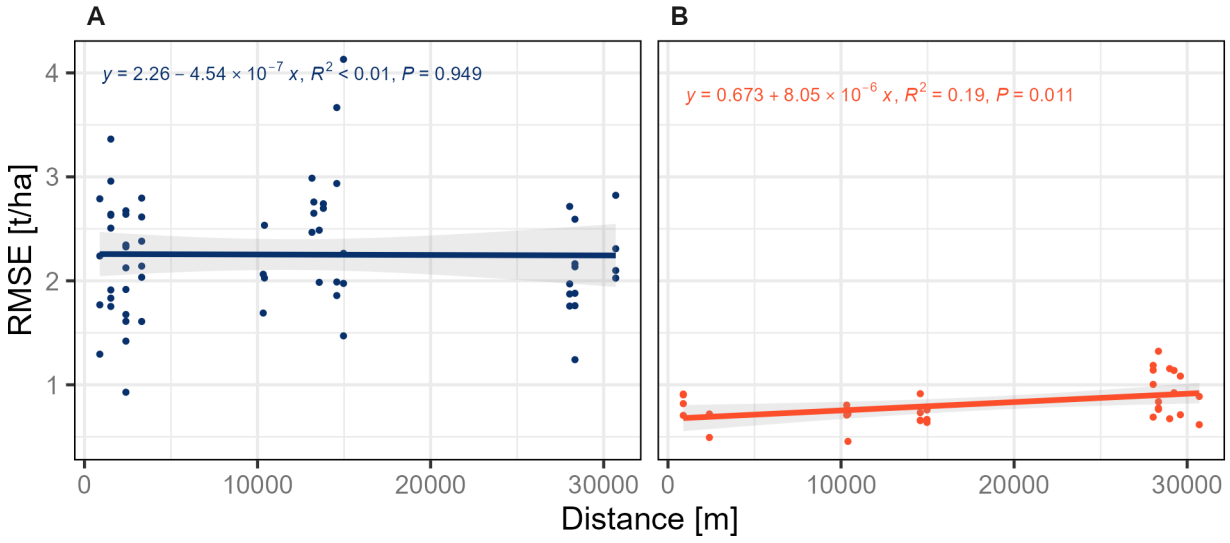

Figure 4.6: Linear regression of the distance between the training and the validation fields and the RMSE of Random Forest in corn (**A**) and soybeans (**B**) in group B.

In addition to the linear regression analysis, we employed variograms to investigate the spatial autocorrelation of the distances between the training and validation fields and the RMSE of the scenarios for each model selected in groups A and B.

In group A, for Corn (4.7A), the sill is 1.09 and the range of the nugget effect is 0.00, meaning that the variations occur at a lag distance smaller than the considered in the variogram. A spherical model was fitted, producing a sill of 0.00, indicating that the total variance of the model is just accounted for the nugget effect, and a range of 3,719.76 m, indicating that beyond this distance, the points are not spatially correlated. In Soybeans (4.7B), in the nugget effect, the sill is 0.29 and the range of the nugget effect is 0.00. A spherical model was fitted, producing a sill of 0.09, suggesting that part of the total variance is explained by the spatial autocorrelation, with a range of 2,737.96 m indicating that beyond that distance, the spatial correlation decreases.

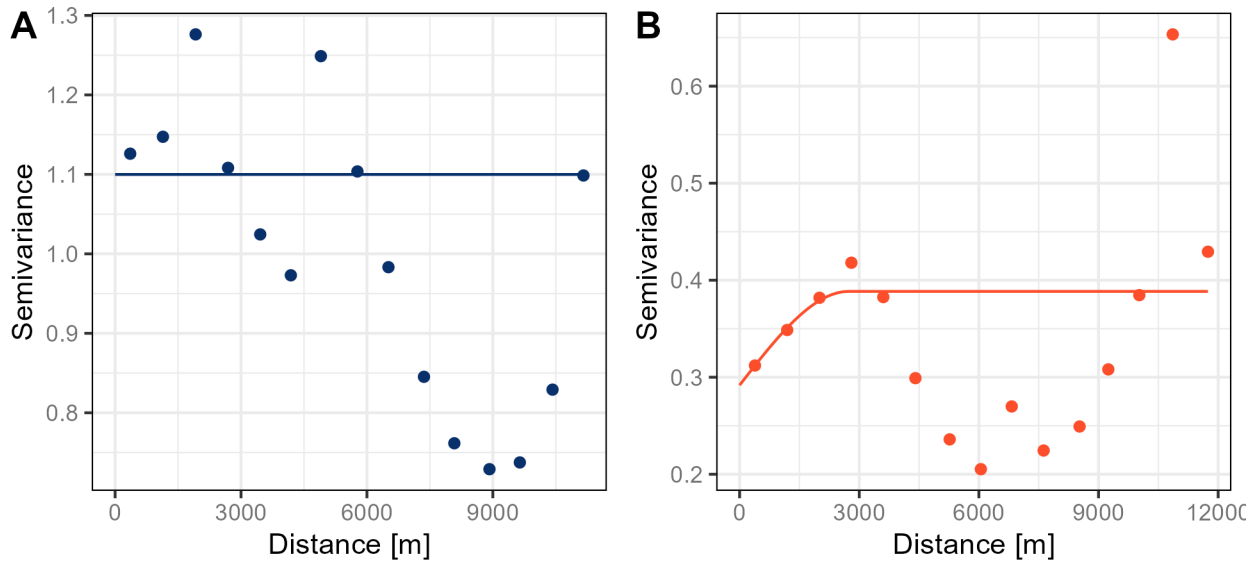

Figure 4.7: Variograms of the distance between the training and the validation fields and the RMSE of the scenarios used in Random Forest in corn (**A**) and soybeans (**B**) in group A.

In group B, for Corn (Figure 4.8A), in the nugget effect exhibited a sill of 0.32 and the range of the nugget effect is 0, meaning that the variations occur at a lag distance smaller than the considered in the variogram. A spherical model was fitted, producing a sill of 0.05, suggesting that spatial autocorrelation explains part of the total variance, and a range of 902.93 m indicating points are

not spatially correlated beyond this distance. In Soybeans (Figure 4.8B), in the nugget effect, the sill is 0.31 and the range of the nugget effect is 0.00, suggesting variations might occur at distances smaller than the minimum lag used in the variogram. A spherical model was fitted, producing a sill of 0.01, indicating that spatial autocorrelation explains part of the total variance, and a range of 1,867.16 m, indicating that beyond this distance the points are not spatially correlated.

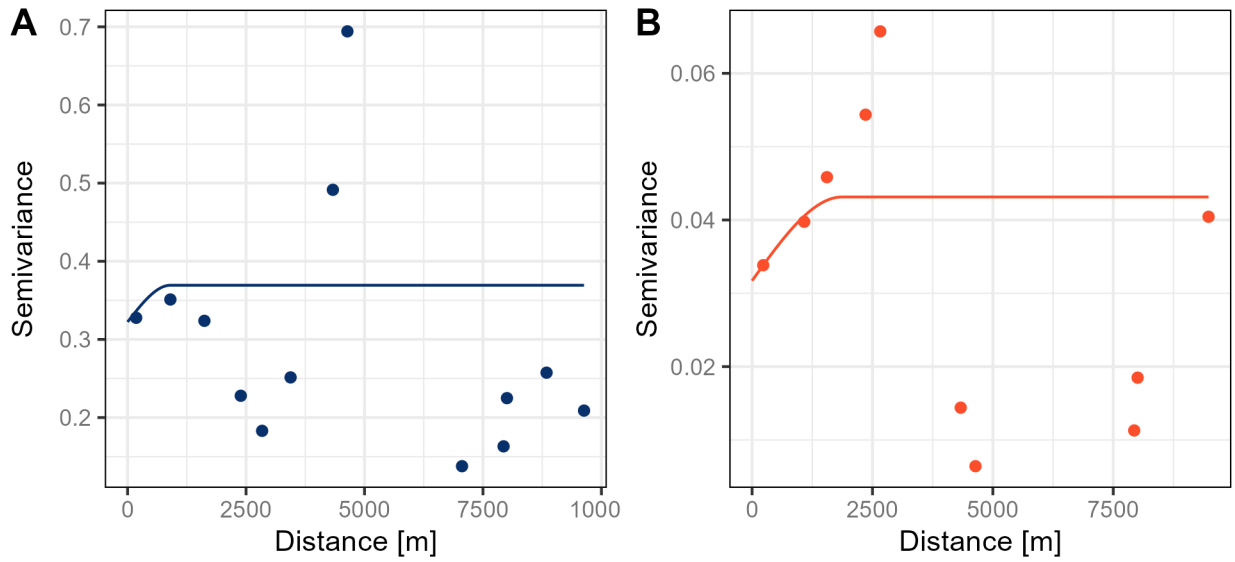

Figure 4.8: Variograms of spatial autocorrelation of the distance between the training and the validation fields and the RMSE of the scenarios used in Random Forest in corn (**A**) and soybeans (**B**) in group B.

4.1.3 Number of Observations and Prediction Accuracy

Each scenario within every group had different numbers of observations in the training and validation datasets. Therefore, we conducted a linear regression analysis to evaluate the correlation between the number of observations in the training and validation datasets and its impact on the RMSE in crop yield predictions. In all groups, Random Forest (RF) was utilized to assess the analysis for corn and soybean yield predictions. In group A, a significant statistical relationship was observed between the number of observations in the training dataset and RMSE for both corn ($p < 0.05$) (Figure 4.9A) and soybeans yield predictions ($p < 0.05$) (Figure 4.9B).

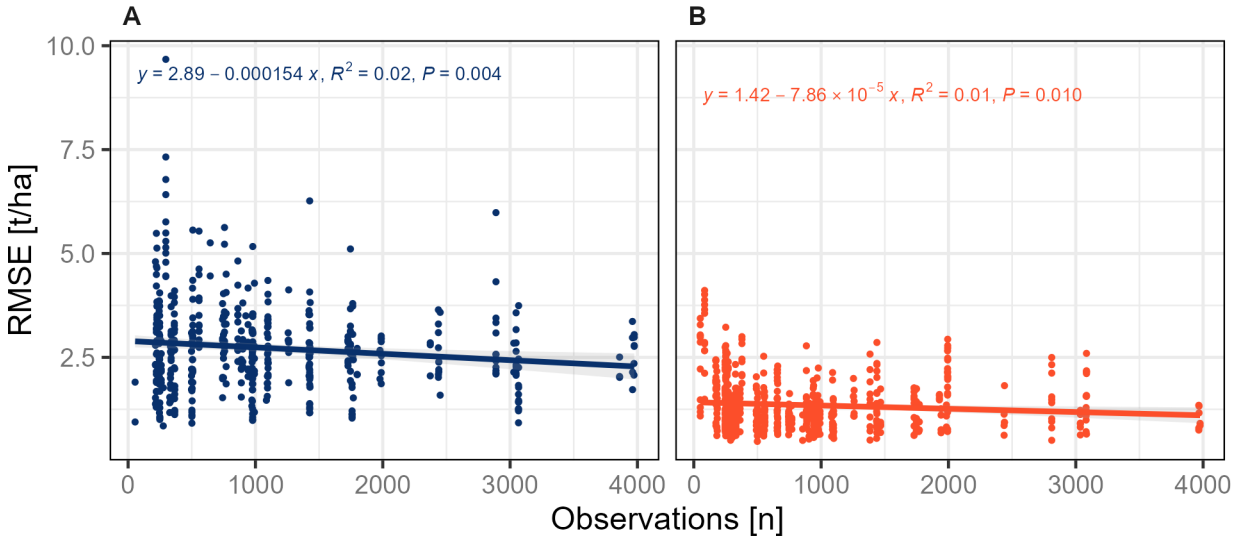

Figure 4.9: Linear regression of the number of observations used in the training dataset and the RMSE of the scenarios used in Random Forest analysis in corn (**A**) and soybeans (**B**) in group A.

In group B, no significant statistical relationship was observed between the number of observations in the training dataset and the mean RMSE for both corn (p> 0.05) (Figure 4.10A) and soybeans yield predictions (p> 0.05) (Figure 4.10B).

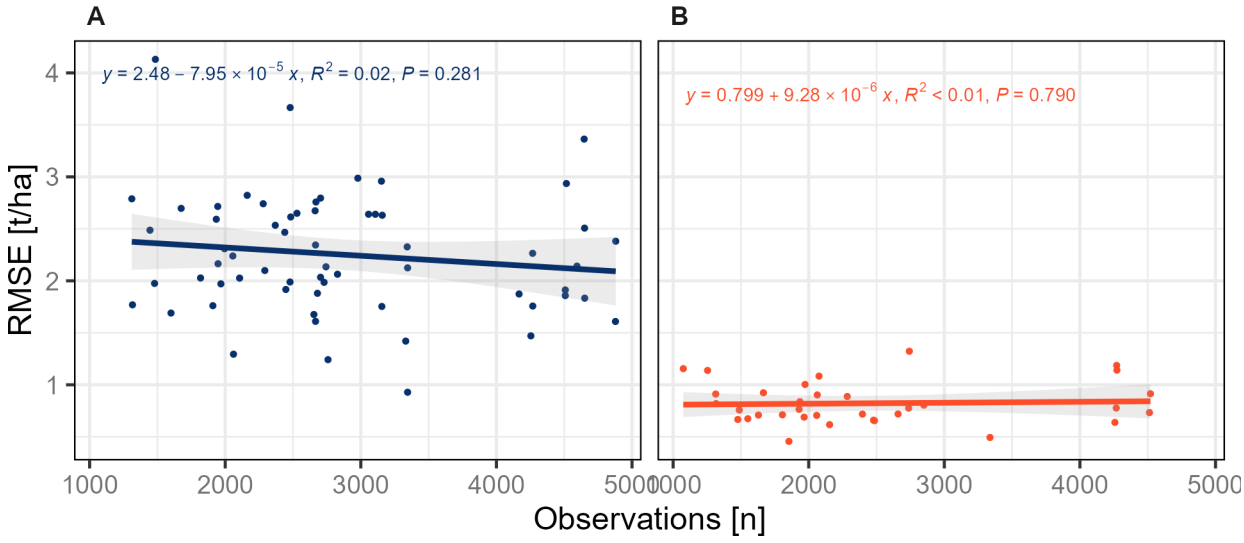

Figure 4.10: Linear regression of the number of observations used in the training dataset and the RMSE of the scenarios used in Random Forest analysis in corn (**A**) and soybeans (**B**) in group B.

In group C, no significant statistical relationship was observed between the number of observations in the training dataset and the mean RMSE for both corn (p> 0.01) (Figure 4.11A) and soybeans yield predictions (p> 0.01) (Figure 4.11B).

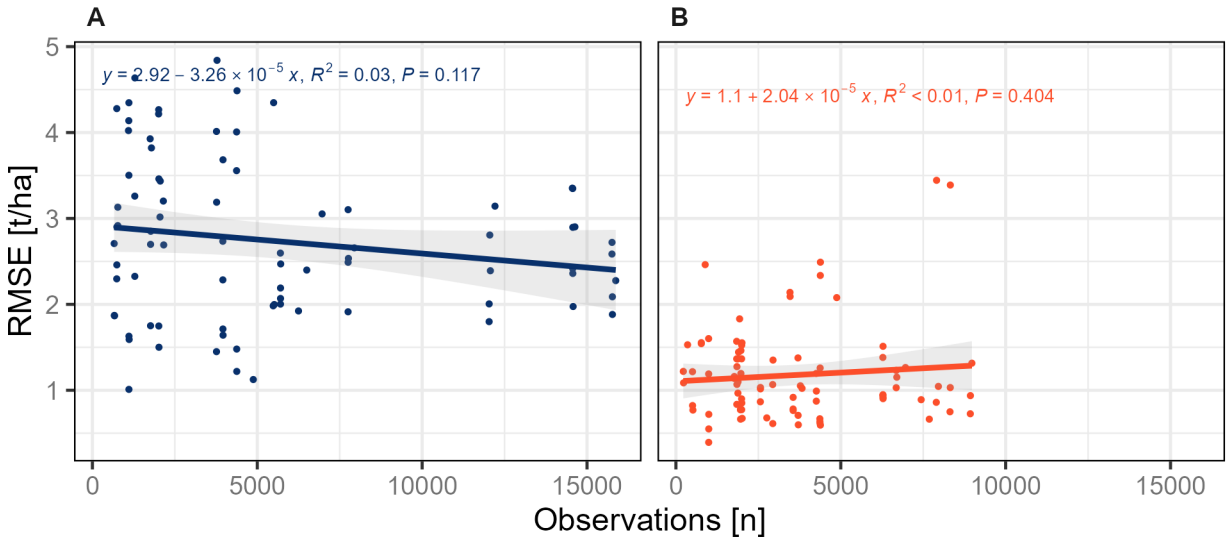

Figure 4.11: Linear regression of the number of observations used in the training dataset and the RMSE of the scenarios used in Random Forest analysis in corn (**A**) and soybeans (**B**) in group C.

In group D, no significant statistical relationships were observed between the number of observations in the in the training dataset and RMSE for both corn (p> 0.05) (Figure 4.12A) and soybeans yield predictions (p> 0.05 (Figure 4.12B).

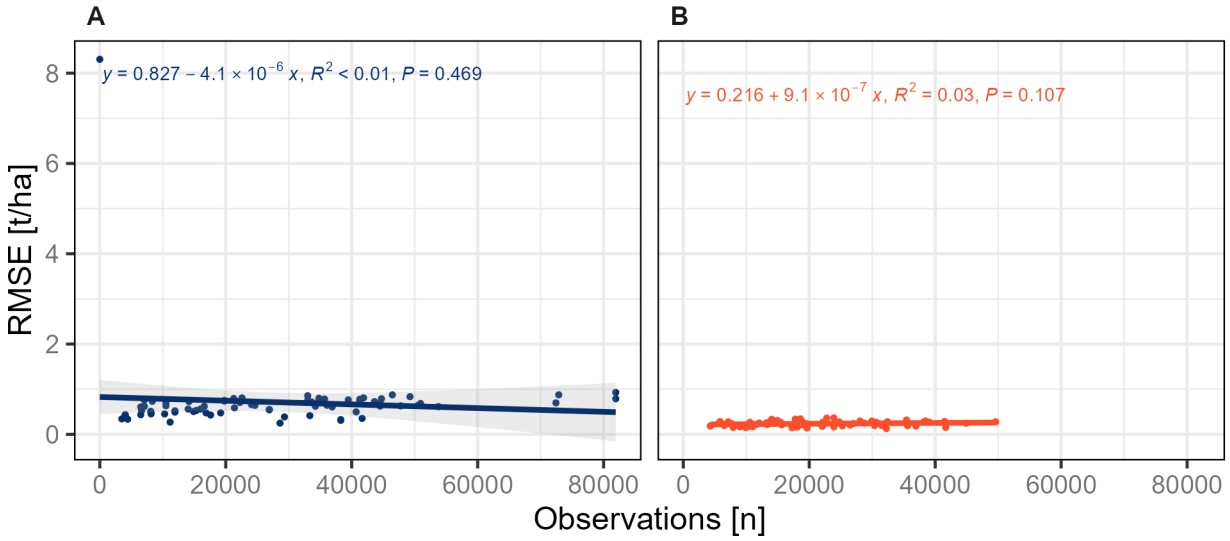

Figure 4.12: Linear regression of the number of observations used in the training dataset and the RMSE of the scenarios used in Random Forest analysis in corn (**A**) and soybeans (**B**) in group D.

In group A, no statistical significant relationship was observed between the number of observations in the validation dataset and RMSE for both corn (p> 0.05) (Figure 4.13A) and soybeans yield predictions (p> 0.05) (Figure 4.13B).

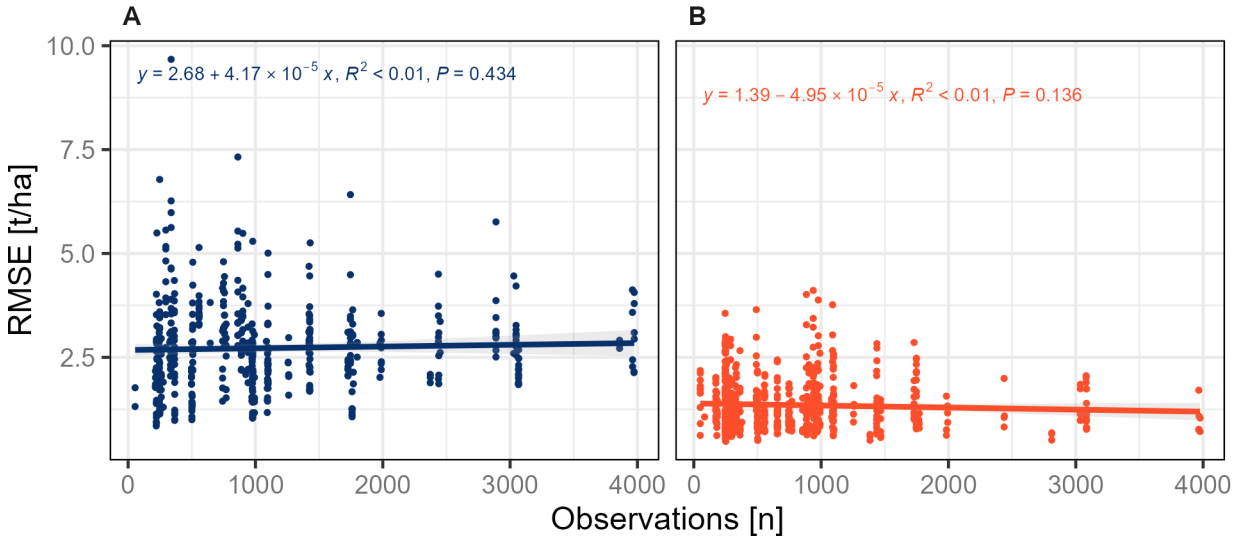

Figure 4.13: Linear regression of the number of observations used in the validation dataset and the RMSE of the scenarios used in Random Forest analysis in corn (**A**) and soybeans (**B**) in group A.

In group B, statistical significant relationship was observed between the number of observations in the validation dataset and RMSE for corn yield predictions ($p < 0.01$) (Figure 4.14A), while no statistical significant relationship was observed between the number of observations in the validation dataset and the RMSE of soybeans yield predictions ($p > 0.05$) (Figure 4.14B).

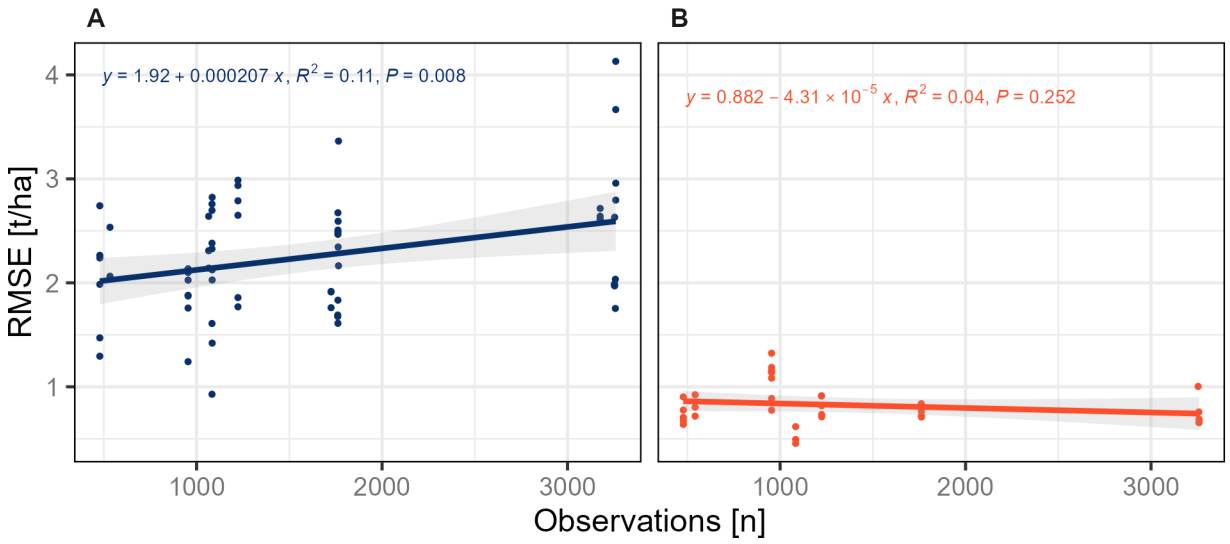

Figure 4.14: Linear regression of the number of observations used in the validation dataset and the RMSE of the scenarios used in Random Forest analysis in corn (**A**) and soybeans (**B**) in group B.

In group C, not statistical significant relationship was observed between the number of observations in the validation dataset and RMSE for corn yield predictions ($p > 0.01$) (Figure 4.15A), while statistical significant relationship was observed between the number of observations in the validation dataset and the RMSE of soybeans yield predictions ($p < 0.01$) (Figure 4.15B).

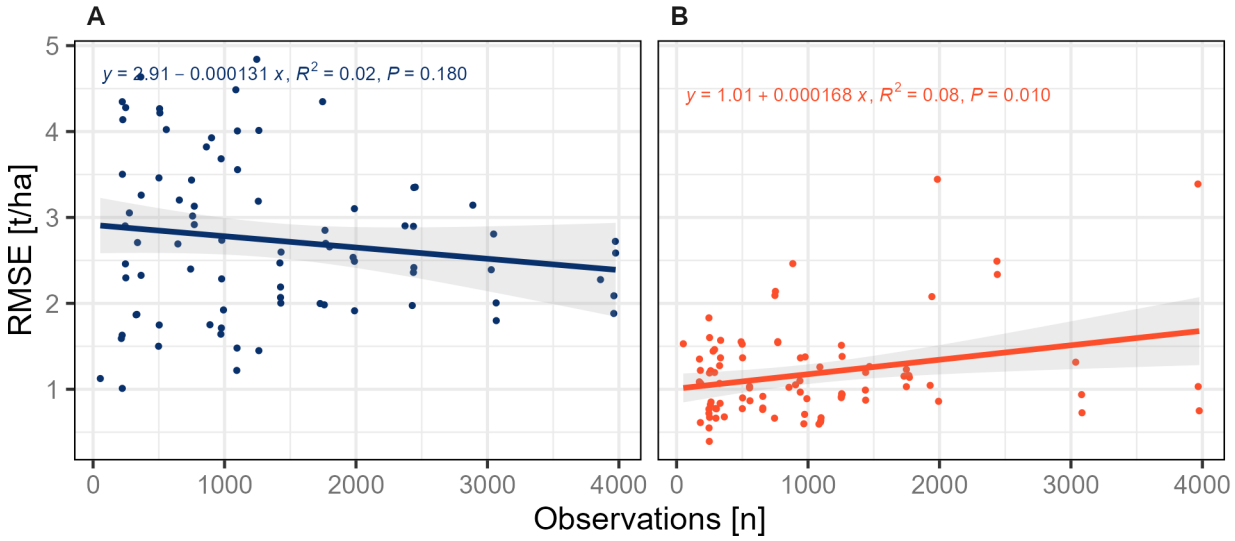

Figure 4.15: Linear regression of the number of observations used in the validation dataset and the RMSE of the scenarios used in Random Forest analysis in corn (**A**) and soybeans (**B**) in group C.

In group D, no significant statistical relationships were observed between the number of observations in the validation dataset and RMSE for both corn (p> 0.05) (Figure 4.16A) and soybeans (p> 0.05) yield predictions (Figure 4.16B).

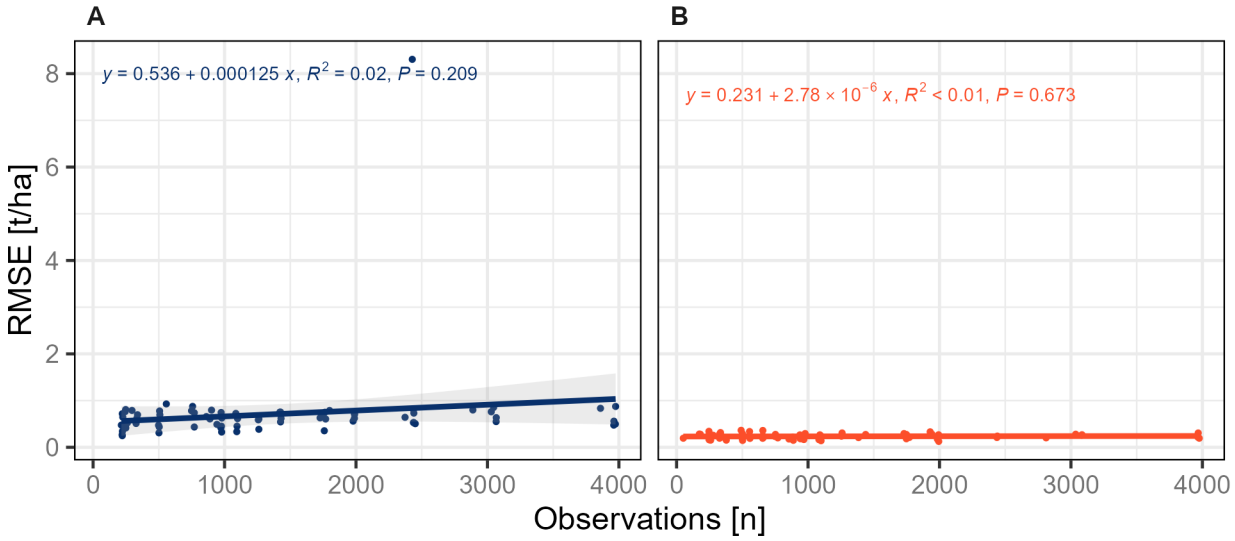

Figure 4.16: Linear regression of the number of observations used in the validation dataset and the RMSE of the scenarios used in Random Forest analysis in corn (**A**) and soybeans (**B**) in group D.

4.1.4 Variable Importance

Following the comprehensive evaluation of all scenarios within each group and model, considering the relationship between distance and mean RMSE, as well as the relationship between the number of observations and mean RMSE, we selected only the scenarios with the lowest RMSE for each crop within the model that demonstrated superior performance, for a more detailed analysis.RF forest was selected from all groups. We provide a description of the training and validation datasets, the computational time to perform the prediction, the RMSE, the R^2, and the relative RMSE. Additionally, the measure of explanatory variable importance of every scenario was calculated. Among the 78 explanatory variables used in the analysis, we identified the top 10 variables that were most important for every crop yield prediction within every group.

In group A, we selected scenarios "GroupA-0839" and "GroupA-0026" for corn and soybeans yield predictions respectively. In scenario "GroupA-0839" corn yield was predicted for 2015 using a training dataset with 276 observations and a validation dataset with 221 observations. The predictions were achieved in 28.59 seconds, resulting in a RMSE = 0.84, a R^2 = 0.03, and the relative RMSE = 0.12. In scenario "GroupA-0461" soybeans yield was predicted for 2012 using a training dataset with 855 observations and a validation dataset with 502 observations. The predictions were achieved in 86.25 seconds, resulting in a RMSE = 0.50, a R^2 = 0.05, and the relative RMSE = 0.14.

In corn yield predictions (Figure 4.17A), three out the ten more important variables were soil properties, while the remaining seven were terrain properties. Notably, soil organic matter exhibited the highest impact, followed by gradient difference, and silt content. In soybeans yield predictions (Figure 4.17B), all ten more important variables were terrain properties. The variable with the higher effect was channel network base level, followed by channel network distance, and standardized height.

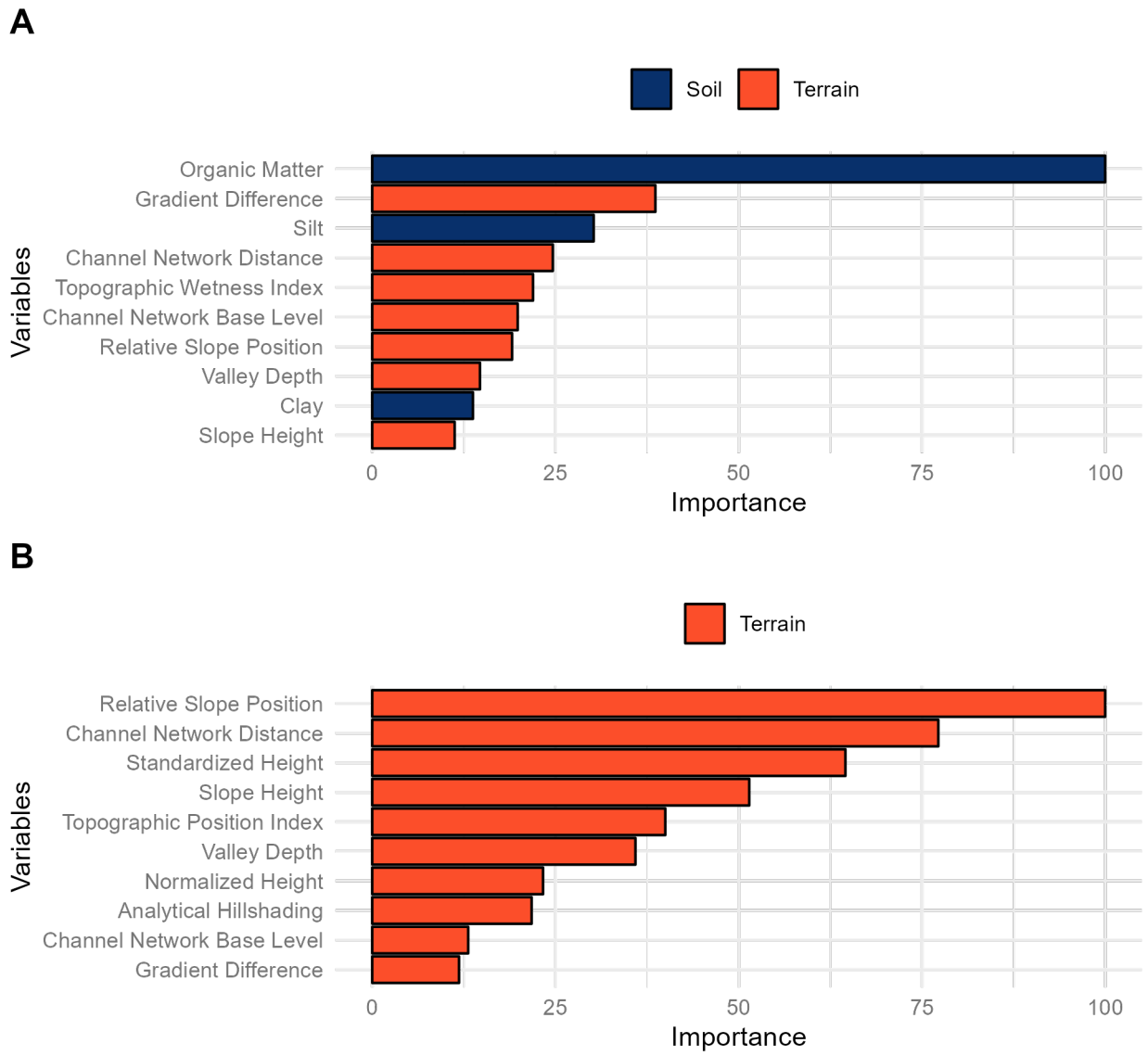

Figure 4.17: Measure of explanatory variable importance based on the results from Random Forest analysis showing the 10 variables with the highest effect in corn (**A**) and soybeans (**B**) yield predictions in group A.

In group B, we selected scenarios "GroupB-0064" and "GroupB-0012" for corn and soybeans yield predictions respectively. In scenario "GroupB-0064" corn yield was predicted for 2016 using a training dataset with 3,345 observations and a validation dataset with 1,083 observations. The predictions were achieved in 451.78 seconds, resulting in a RMSE = 0.92, a R^2 = 0.02, and the relative RMSE = 0.10. In scenario "GroupA-0012" soybeans yield was predicted for 2020 using

a training dataset with 1,854 observations and a validation dataset with 1,084 observations. The predictions were achieved in 220.51 seconds, resulting in a RMSE = 0.45, R^2 = 0.05, and the relative RMSE = 0.10.

In corn yield predictions (Figure 4.18A), one out ten more important variables was a management practice; irrigation, one out of ten variables was soil properties, and the remaining eight variables were terrain properties. Irrigation emerged as the most influential variable, followed by gradient difference and channel network base level. In soybeans yield prediction (Figure 4.18B), one out ten more important variables was a management practice; irrigation, one out of ten more important variables was a soil property, and the remaining eight variables were terrain properties. Once again, irrigation emerged as the most influential variable, followed by channel network base level, and slope.

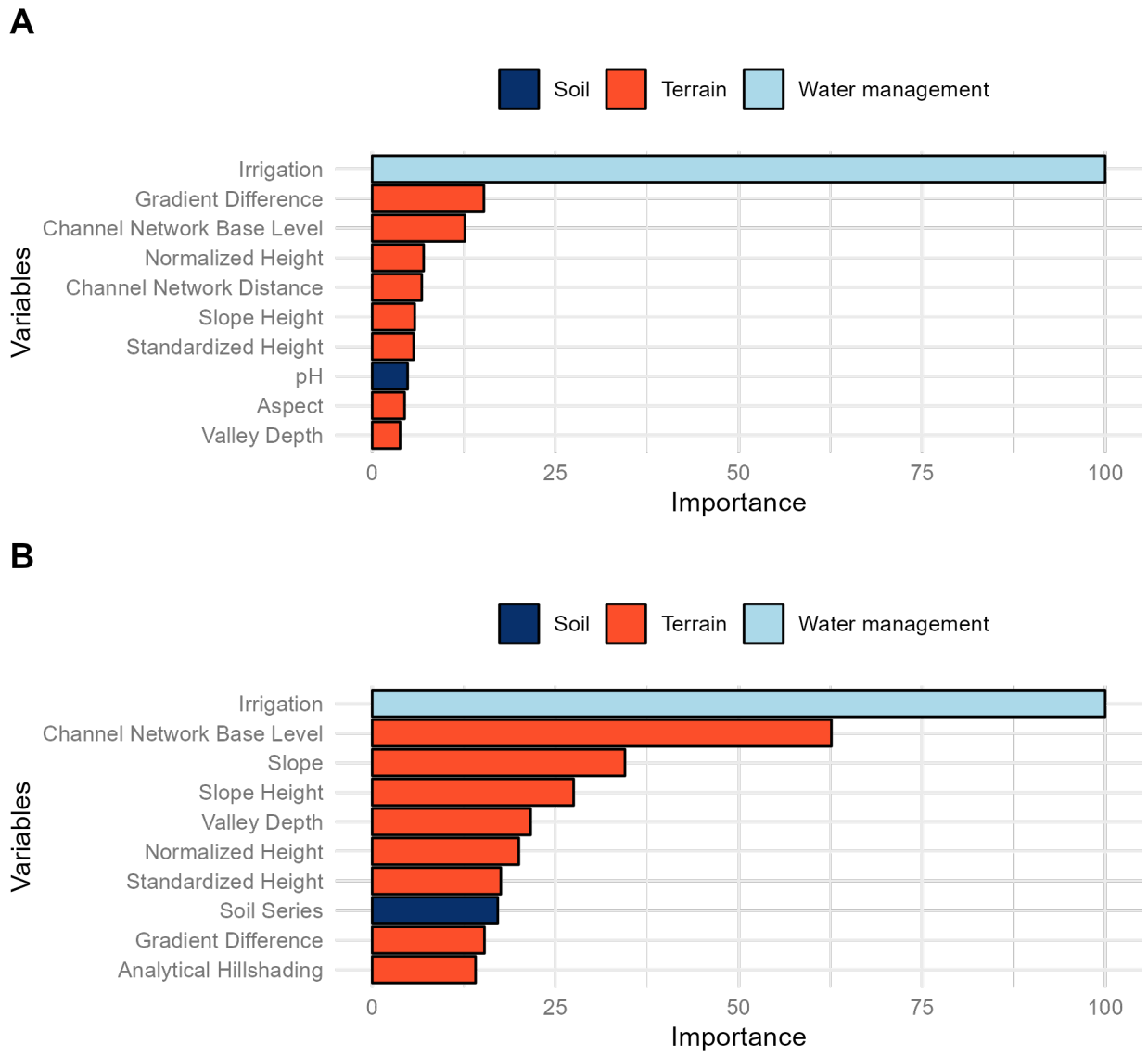

Figure 4.18: Measure of explanatory variable importance based on the results from Random Forest analysis showing the 10 variables with the highest effect in corn (**A**) and soybeans (**B**) yield predictions in group B.

In group C, we selected scenarios "GroupC-0119" and "GroupC-0001" for corn and soybeans yield predictions, respectively. In scenario "GroupC-0119" corn yield was predicted for 2016 using a training dataset with 1,107 observations and a validation dataset with 222 observations. The predictions were achieved in 99.77 seconds, resulting in a RMSE = 1.01, a R^2 = 0.15, and the relative RMSE = 0.13. In scenario "GroupC-0001" soybeans yield was predicted for 2013

using a training dataset with 994 observations and a validation dataset with 249 observations. The predictions were achieved in 89.35 seconds, resulting in a RMSE = 0.39, a R^2 = 0.36, and the relative RMSE = 0.10.

In corn yield predictions (Figure 4.19A), nine out ten more important variables were climate properties, and one out of ten properties was a terrain variable. Moderate Drought (SPEI) exhibited the highest impact, succeeded by Mild Drought (SPEI), and Moderate Drought Cumulative (SPEI). In soybeans yield prediction (Figure 4.19B), eight out ten more important variables were climate variables, and two of the ten variables were terrain variables. The variable with the most significant effect was channel network base level, followed by Abnormal Drought (PDSI), and Water Balance Cumulative.

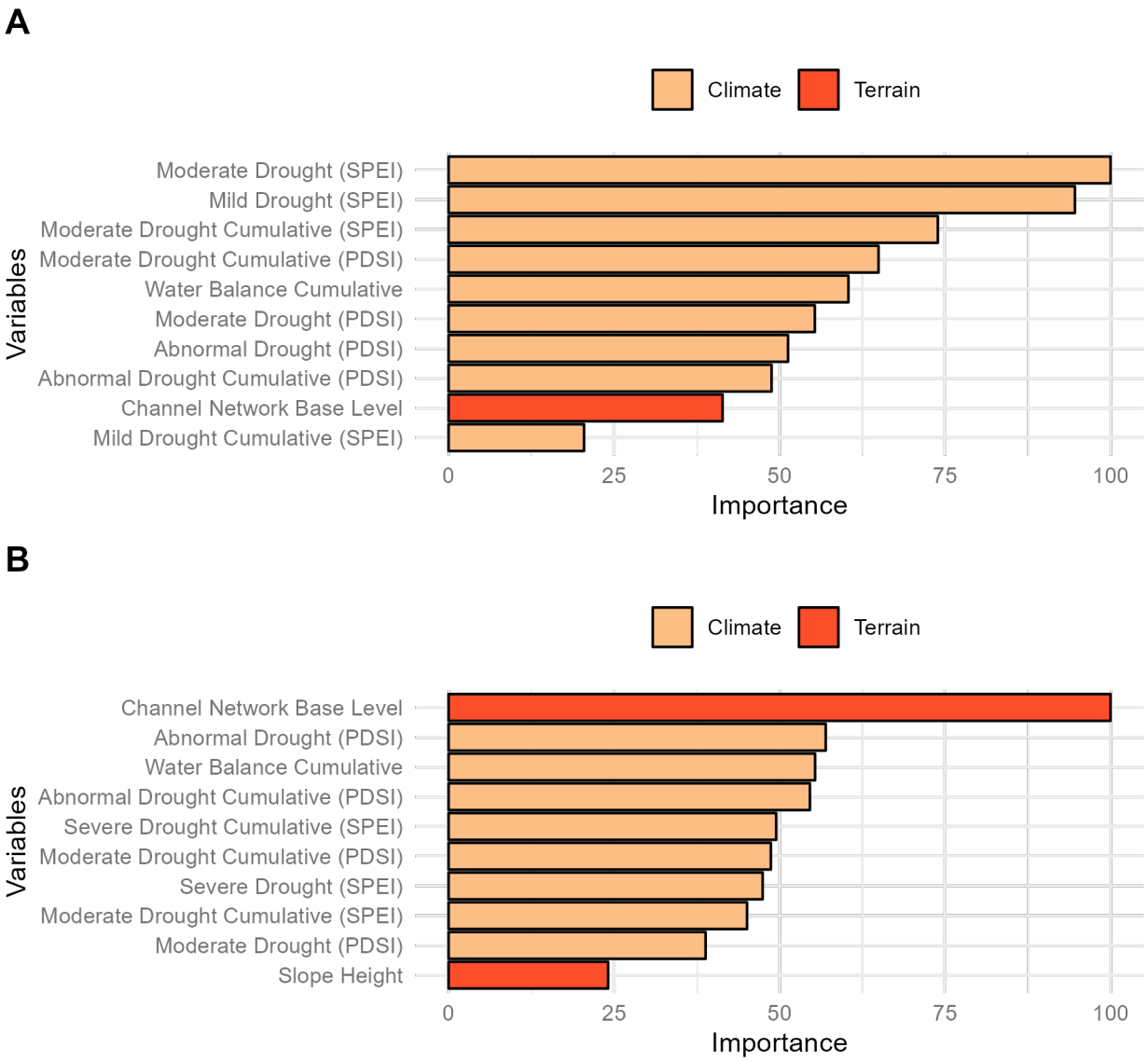

Figure 4.19: Measure of explanatory variable importance based on the results from Random Forest analysis showing the 10 variables with the highest effect in corn (**A**) and soybeans (**B**) yield predictions in group C.

In group D, we selected ”GroupD-0035” and ”GroupD-0016” for corn and soybeans yield predictions, respectively. In scenario ”GroupD-0035” corn yield was predicted for 2016 using a training dataset of nine fields with yield data from 2013, 2016, 2020 and 2021 with 28,618 observations and a validation dataset with 222 observations. The predictions were achieved in 4.83

h, resulting in a RMSE = 0.24, a R^2 = 0.93, and the relative RMSE = 0.03. In scenario "GroupD-0016" soybeans yield was predicted for 2012 using a training dataset of twelve fields with yield data from 2012, 2013, 2014, 2017, 2018, 2020 with 19,645 observations and a validation dataset with 1,099 observations. The predictions were achieved in 3.80 h, resulting in a RMSE = 0.14, a R^2 = 0.94, and the relative RMSE = 0.03.

In corn yield predictions (Figure 4.20A), one out of the ten more important variables was crop, while five out of the ten more important variables were climate properties, one out of the ten more important variables was a terrain variable, one out the ten more important variables was a management practice; irrigation, and two out of the ten more important variables were soil variables. The variable with the higher effect was crop, succeeded by irrigation, and Channel Network Base Level. In soybeans yield prediction (Figure 4.20B), six out of the ten more important variables were climate variables, one out of the ten more important variables was crop, one out of the ten more important variables was a terrain variable, one out the ten more important variables was a management practice; irrigation, and one out of the ten more important variables was a soil variable. Similar to corn yield predictions, the variable with the higher effect was crop, succeeded by irrigation, and Channel Network Base Level.

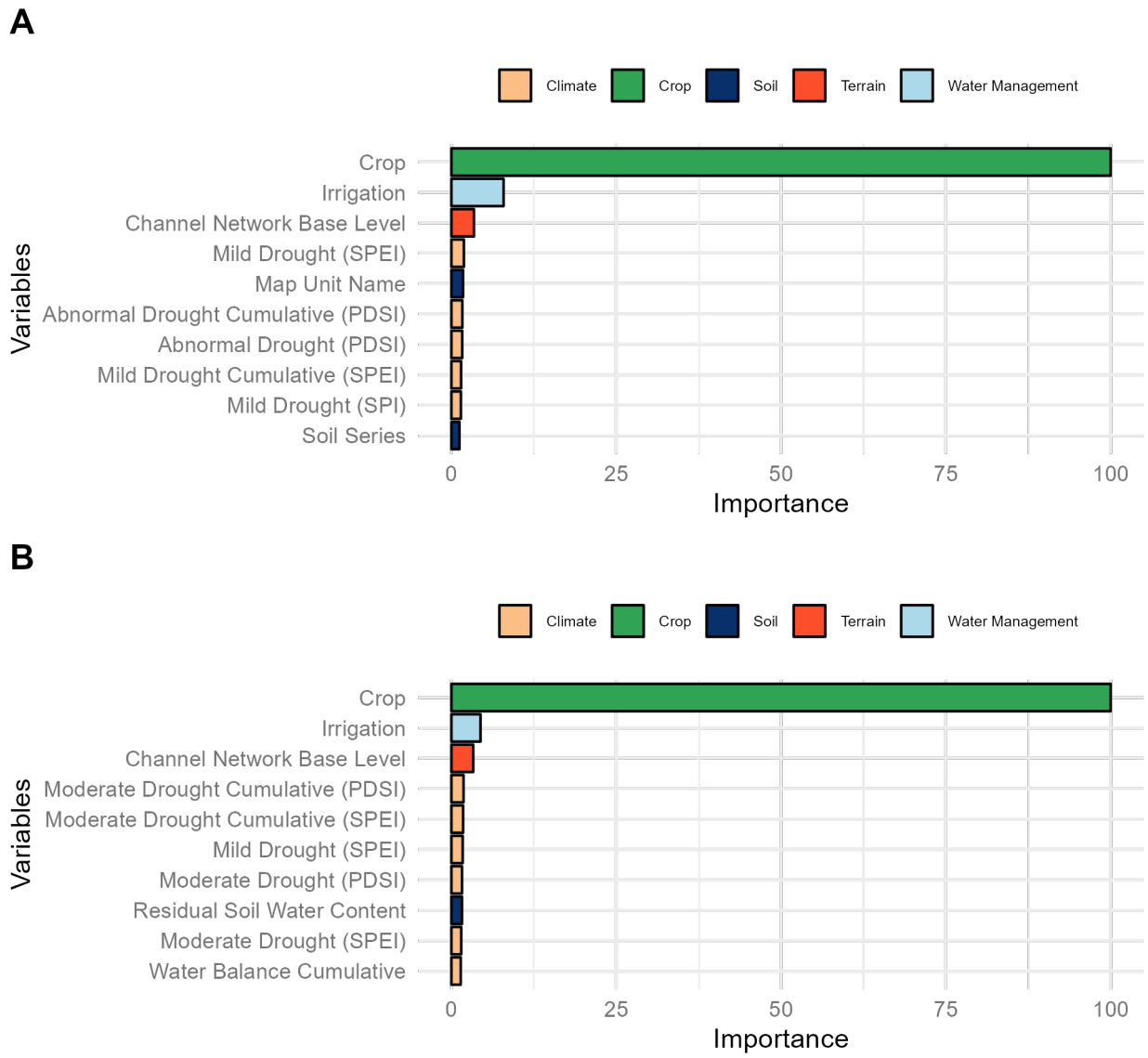

Figure 4.20: Measure of explanatory variable importance based on the results from Random Forest analysis showing the 10 variables with the highest effect in corn (**A**) and soybeans (**B**) yield predictions in group D.

4.1.5 Discussion

The objective of this statistical approach was to evaluate different machine learning methods on crop yield prediction and assess prediction accuracy based on different scenarios, and to investigate which predictor variables have the highest impact on crop yield predictions. We have evaluated

four machine learning algorithms: Support Vector Machine, Elastic Net Regression, Stepwise Regression, and Random Forest under the following aspects:

- Identification of variables with the highest effect on yield predictions.
- Yield predictions based on adjacent fields with the same water management.
- Yield predictions from irrigated fields.
- Yield prediction for a specific year utilizing data from other years within the same field.
- Yield prediction of one field for an specific year using other fields with crop production in the same years.

Variable importance calculations were made to select the variables with the highest effect in crop yield predictions. Here we will focus in four main discussion points; accuracy of the models evaluated per group, the relationship of the distance between training and validation datasets with mean RMSE, relationship of the number of variables between training and validation datasets with mean RMSE, and the evaluation of the more important variables in the crop yield predictions in the "scenario" case.

Several variables have been used to calculate crop yield predictions, where remote sensing data derived from satellites and UAVs is the most common feature, alongside weather, and soil parameters. On the contrary, factors like topographic, irrigation, and fertilization data are less frequently used features to predict crop yield Benos et al. (2021).

Multiple studies have focused on predicting crop yields, particularly in corn and soybeans, utilizing diverse datasets of predictors. Some studies have only used satellite spectral data. As an example, (Sayago, Bocco, et al., 2018) used satellite images from Landsat and SPOT to calculate corn and soybeans yield predictions in Argentina. The researchers assessed two different models; Neural Networks (NN) and multiple linear regression models. The NN demonstrated higher accuracy in the predictions of soybeans yield (R^2 = 0.90) and corn yield (R^2 = 0.92).

Another investigation conducted by Kayad et al. (2019) utilized Sentinel-2 images to compute vegetation indices (VIs) and machine learning to evaluate spatial variability in corn grain yield in Italy. The researchers found that Green Normalized Difference Vegetation Index (GNDVI) produced the highest coefficient of determination (R^2 = 0.48) for monitoring crop yield throughout the period of 105 to 135 (R4-R6) days after the planting date. The Random Forest (RF) model achieved a higher accuracy in the predictions, with an R^2 = 0.60. These predictions were accomplished utilizing 50% of the observations in both the validation dataset and the training dataset.

Others studies have included weather data. Sun, Di, Sun, Shen, and Lai (2019) utilized environmental variables, including weather, Land Surface Temperature (LST), Surface Reflectance (SR) data, and historical crop yield data to predict soybeans yield at a county level in the United States. This was achieved by employing machine learning algorithms such as Convolutional Neural Network (CNN) and Long Short-Term Memory (LSTM) individually and in a combination (CNN-LSTM). Their findings demonstrated CNN-LSTM outperformed other models, with the highest coefficient of determination (R^2 = 0.74).

Some authors implemented a hydrologic, weather, and satellite spectral data. An study conducted by Kim et al. (2019) utilized various data sources including cropland layers, satellite-derived vegetation indices (Normalized Difference Vegetation Index (NDVI), Enhanced Vegetation Index (EVI), Leaf Area Index (LAI), Fraction of Photosynthetically Activate Radiance ((FPAR) and Gross Primary Production (GPP)), meteorological data derived from the PRISM climate group (precipitation and maximum, minimum, and mean temperature), soil moisture data, and crop yield statistics. The study aimed to predict corn and soybean yields in the Midwestern United States using 6 different machine learning algorithms: Multivariate Adaptive Regression Splines (MARS), Support Vector Machine (SVM), Random Forest (RF), Extremely Randomized Trees (ERT), Artificial Neural Network (ANN) and Deep Neural Network (DNN). The researchers found that DNN was the best model for predicting corn yield (RMSE = 0.76 t/ha) and soybeans (RMSE = 0.28 t/ha). Additionally, the months of July and August were identified as the optimal time period for predicting crop production throughout the May to September crop season.

Khanal et al. (2018) implemented soil properties (soil organic matter (SOM), cation exchange capacity (CEC), magnesium (Mg), potassium (K), and pH), topographic, multispectral aerial images for predicting soil properties and corn yield. They evaluated 5 machine learning algorithms: Random Forest (RF); Neural Network (NN); Support Vector Machine (SVM), Gradient Boosting Model (GBM) and Cubist (CU). For every soil property predicted, a different model exhibited a higher performance. For corn yield predictions, RF provided higher accuracy among the models with an R^2 = 0.53 and a RMSE = 0.97.

Each study presents unique combinations of predictors depending of the specific target. In our study, we incorporate several climate, soil, and terrain properties to predict corn and soybeans yield, a combination not previously explored in the literature. Among the various machine learning algorithms employed in crop yield prediction, Artificial Neural Networks (ANNs), Random Forest (RF), and Support Vector Machine (SVM) are commonly used.

Model Evaluation

In group A, in corn and soybeans yield predictions, we did not find statistical significant different between RF and SVM or between ENR and SR. However, RF produced the lowest mean RMSE, more scenarios, and the lowest mean relative error. For this reason, we reject the hypothesis that RF is the most accurate machine learning algorithm in corn and soybeans yield predictions. We attribute the low performance of our predictions to the scenarios features. As default, researchers use 70 or 80% of the total data to train the models and 20 or 30% to validate it. In our case, we have different fields with different amount of observations and characteristics for training and for validation. Those field can be closer or further away and even if some terrain and soil properties are similar some difference in space might persist.

The scenarios in group A and group B are similar. The same irrigated fields used in the scenarios of group A, were used in group B, with the difference than in group B the rainfed data outside the pivot were extracted from the validation dataset and combined with the training dataset. Leaving just the irrigated areas under the pivot in the validation dataset. With this change, the

accuracy of the predictions in this group increased (Table 4.7). In both crops predictions, we did not find statistical significant different between all the models. Although RF produced the lowest mean RMSE and the lowest, more scenarios, and the lowest relative error. For this reason we reject the hypothesis that the most accurate machine learning algorithm is RF in corn and soybeans yield predictions.

Table 4.7: Mean RMSE and SD from Random Forest in group A in irrigated fields compared to group B for corn and soybeans yield predictions.

Crop	Group	Model	Count	Mean RMSE [t/ha]	SD
Corn	group A	RF	62	2.70	0.65
	group B	RF	62	2.25	0.58
Soybeans	group A	RF	38	1.10	0.33
	group B	RF	34	0.82	0.20

In group C, in corn, we did not find statistical significant different between ENR and the other models (RF, SVM, and SR). RF and SVM were not statistical significant different between them, and SR was statistically significant different from all the models. However, RF produced the lowest mean RMSE and relative error. In soybeans, we did not find statistical significant different between all the models. Although RF produced the lowest mean RMSE, the highest amount of scenarios, and the lowest relative error. In group C, we reject the hypothesis that the most accurate machine learning algorithm was Random forest in crop yield predictions.

Group C achieved a lower RMSE and higher coefficient of determination (R^2) in comparison to groups A and B. We attribute this difference to the group design, where historical data from the same field was used in the training and in the validation dataset. For example, if there where field with yield data from various years (2012, 2013, 2015, 2017, 2018, 2020). One year was chosen for validation, while the remaining years were used for training. This process was iterated until all years from every field were used as validation. The field needed more than two year of yield data of the same crop to create the scenarios.

A similar approach was developed by (Maestrini & Basso, 2018). They used historical yield data to create crop yield predictions. In their study, they used fields that had crop yield for at least 4 years. In the case of 4 years, they used the first three years as predictors, and the last year of crop production as validation. In the case of 5 years, they used the first 3 years as predictors and the fourth year as validation. Subsequently, they used the first 4 years as predictors and validated it in the fifth year. They found that historical yield was the best predictor for the spatial distribution of corn, wheat, and cotton yields, However, it was not a reliable predictor for soybean yield.

Group D, in both crops, it created scenarios with highest amount of observations, that included two crops, more than 1 field and year, in the training data, resulting in a more varied and detailed dataset to train the model. We found statistical significant different between all the models, where RF obtained, the lowest mean RMSE (corn = 0.71 t/ha and soybeans = 0.23 t/ha) and mean relative error (corn = 0.07 and soybeans = 0.07). We accept the hypothesis that the most accurate machine learning algorithm was RF in corn and soybeans yield predictions.

In our scenario selected, in corn yield we obtained an RMSE = 0.24 and an R^2 = 0.93. In soybeans, we obtained an RMSE = 0.14 and an R^2 = 0.94. Our results aligns with other studies that found RF as the best model to predict crop yield. (Khanal et al., 2018)) obtained an R^2 =0.53, and (Kayad et al., 2019) obtained an R^2 = 0.60. However, our RMSE is lower and R^2 is higher compared to them. We attribute these difference to the particular data used to create the scenarios. Where the implementation of larger datasets provide a more realistic scenario of what its happening in the field and what might be affecting the crop yield.

Distance Effect

In group A, we found a significant statistical relationship in the distance between training and validation datasets in both crop predictions. In corn yield predictions, no spatial correlation was found, although, in soybeans yield predictions, part of the total variance was explained by the spatial autocorrelation. In group B, we did not find a significant statistical relationship in the distance between training and validation datasets in corn yield predictions. However, we found

significant statistical relationship in soybeans yield predictions. Overall, spatial correlation was found in corn yield and soybeans predictions that suggest that in the scenarios, part of the total variance was explained by the spatial autocorrelation. Based on this results, we can attribute that distance might have in the predictions but further analysis and evaluations are required.

Number of Observations

In group A, the amount of observations used in the training and the validation dataset was relatively low compared to the other groups. The scenarios were randomly created based on different conditions given in a script. This resulted in some scenarios with lower amount of observations in the training than in the validation dataset. Ideally, the training data should always be higher than the validation data, because it is used to train the model and the larger the dataset the more complex relationships can learn. This can affect the accuracy of the predictions, producing overffiting, or predictions that don't represent the variability of the data leading to a decrease of the model performance. In the relationship of the number of observations in the training and validation datasets with mean RMSE, no statistical significant relationship was observed between the number of observations between the validation and the RMSE in both crops. However, a statistical significant relationship was observed between the number of observations between the training and the RMSE in both crops.

In group B, a statistical significant relationship was observed between the number of observations between the validation and the RMSE in corn yield predictions, but no in soybeans yield predictions. On the contrary, no statistical significant relationship was observed between the number of observations between the training and the RMSE in both crops.

In group C, no statistical significant relationship was observed between the number of observations between the validation and the training dataset with the RMSE in corn yield predictions. However, a statistical significant relationship was observed between the number of observations in the validation dataset and RMS, but not in the number of observations between the training dataset and the RMSE in soybeans yield predictions.

In this group, the amount of observations in the training dataset increased significantly because various years of data were included. The lowest amount of observations in the training data for corn yield predictions were 660, and 224 for soybeans yield predictions, compared to group A, where the lowest amount of observations used in the training dataset of two scenarios were 55, and 51 observations in eleven scenarios for soybeans yield predictions. We reduced the effect of the spatial variability because the same field was used as training and validation. However here, the temporal variability plays an important role because several years were used in the training dataset. The results from this group showed that reducing the spatial variability and increasing the number of years with different observations in the training data, produced more accurate predictions.

In group D, no statistical significant relationship was observed between between the number of variables between the validation and the RMSE and the number of variables between the training and the RMSE in both crops. In this group, the lowest amount of observations was 4,315 for corn and soybeans yield predictions. In corn and soybeans yield prediction, the scenarios selected achieved more accurate predictions compared to group A, B, and C. Although the predictions took a higher computational time, the predictions in both crops have a very high accuracy, explaining more than 90% of the variation. The results from this group showed that increasing the variety of observations (different years, different crops, different distances between fields) in the training data, produced more accurate predictions.

These results suggest that when the number of observations in the training or in the validation datasets is limited, they might have an effects in the accuracy of the predictions. Conversely, when the amount of observations is relatively high in the training or validation data, this effect is nos statistical significant.

Variable Importance

In group A, in the scenarios selected for corn and soybeans yield predictions, the predictions were achieved very fast, just in 28.5 seconds and 52.7 seconds, respectively. But the R^2=0.03 in both predictions is relatively low and demonstrate that just 3% of the variation in or data is represented

by our model. In corn, the predictions were most affected by organic matter which aligns with the findings of Burdett and Wellen (2022) that demonstrated that OM was significant in crop yield predictions. Soybeans the predictions were highly affected by the relative slope position.

In group B, in the scenarios selected in corn yield predictions, the number of observations used in the training and the validation dataset increased compared to the selected scenario in group A. This scenario achieved the predictions in 451.78 and 220.51 seconds for corn and soybeans respectively. The RMSE remained low in both crop predictions. But the R^2=0.02 of corn and soybeans R^2=0.05 yield predictions was very very low that suggest that the model just explained 2% and 5 % of the variation in the predictions. Here, the irrigation had an effect in the predictions, we attribute this result to the group characteristics, where the rainfed areas where removed from the validation dataset. Also, in group A and B, our results showed that in corn and soybeans yield predictions terrain properties had a higher impact than soil properties.

In group C, in corn yield predictions, the variable with the highest impact on crop yield predictions was Moderate Drought (SPEI) and in soybeans was channel network base level. In soybeans yield predictions, not other studies have previously explored the influence of this terrain variable in crop yield prediction. However, it was used by Hateffard, Dolati, Heidari, and Zolfaghari (2019) in mapping soil characteristics, resulting in one of the most effective factor for predicting organic carbon and by Guevara and Vargas (2019) for predicting soil moisture using machine learning.

In group D, climate attributes played an important role in crop yield predictions followed by few terrain and soil properties where data from multiple fields spanning several years and diverse crop yields was included into the training dataset, contrary to group A, B and C, where terrain properties and soil properties had a higher impact in corn and soybeans yield predictions. Due to the requirements used to create this group, where both crops where included in the training data, crop stand out as the variable with the highest effect on corn ans soybeans yield, followed by irrigation and channel network base level.

4.2 Integrated Nested Laplace Approximation (INLA)

In the second statistical analysis, we select the ten covariables with lowest DIC to evaluate their effect on corn and soybeans yield, and evaluate the relationship between each drought index classification with the yield effect by irrigation.

4.2.1 Irrigation Effect

Corn and soybeans mean yield obtained from irrigated and non-irrigated fields during ten consecutive years are plotted in Figure 4.21 where we can identify the differences in yield obtained with the pivot irrigation and the non irrigated areas. In some years the differences in yield are minimum, but in other years, the non-irrigated produced higher yields. For example, in 2012, corn yield from non-irrigated areas was 1.70 t/ha higher than the irrigated areas. Whereas, in 2015, soybeans yield from not-irrigated areas were 0.20 t/ha higher than the irrigated areas. In 2021, soybeans yield from the non-irrigated areas was 0.1 t/ha higher than the irrigated areas. On the other hand, in 2016, corn yield from irrigated areas was 3.9 t/ha higher than the not-irrigated areas. This year produced the highest yield difference between the irrigated and the not-irrigated areas.

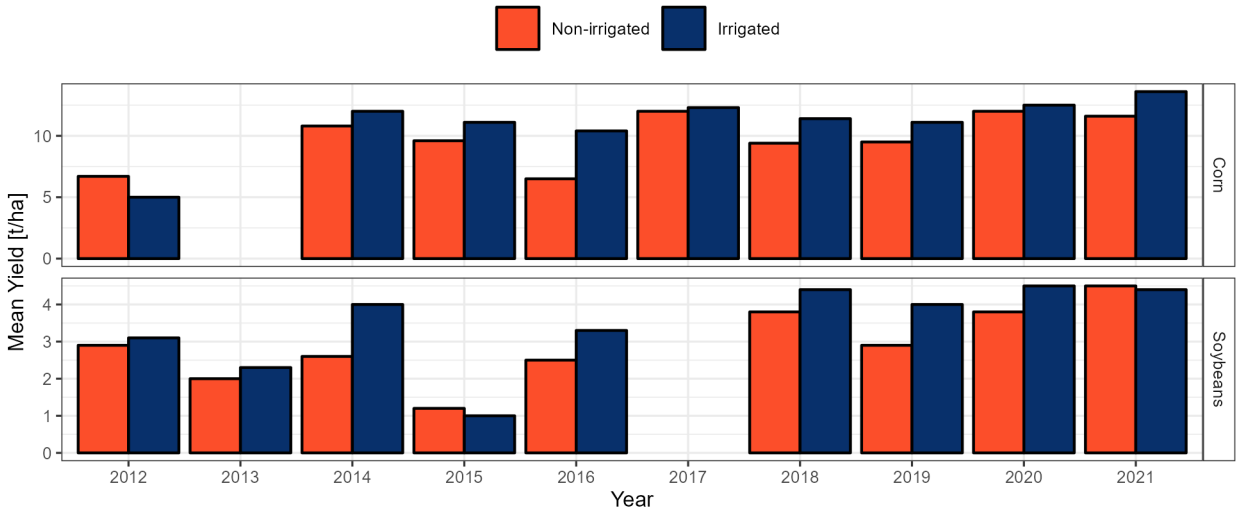

Figure 4.21: Total mean yield in t/ha for corn and soybeans during 10 consecutive years.

After the INLA analysis, the yield increase by the irrigation effect was estimated for every crop and plotted for corn (Figure 4.22) and soybeans (Figure 4.23). From the models evaluated, ”AR8” produced the lowest DIC. In corn, the yield increase by the irrigation effect was not higher than 2.00 t/ha for eight out of nine years. Except for 2016 that obtained the highest yield increase of 3.07 t/ha in field CS. In some years, the effect was negative such as 2012 where the irrigation had a negative effect of 0.4 t/ha, also in 2017, the irrigation had a negative effect on yield in three out of the four fields, especially in field CS where yield had a negative effect of 1.12 t/ha. In 2021, the irrigation had a negative effect of 0.5 t/ha on yield in one out of three fields. In soybeans, the yield increased by the irrigation effect was not higher than 2 t/ha for all the years. In 2021, the irrigation had a negative effect on yield in three out of the four fields with the highest negative effect of 0.40 t/ha in field 2PB. The highest yield increase was 1.20 t/ha in 2014 in field RD.

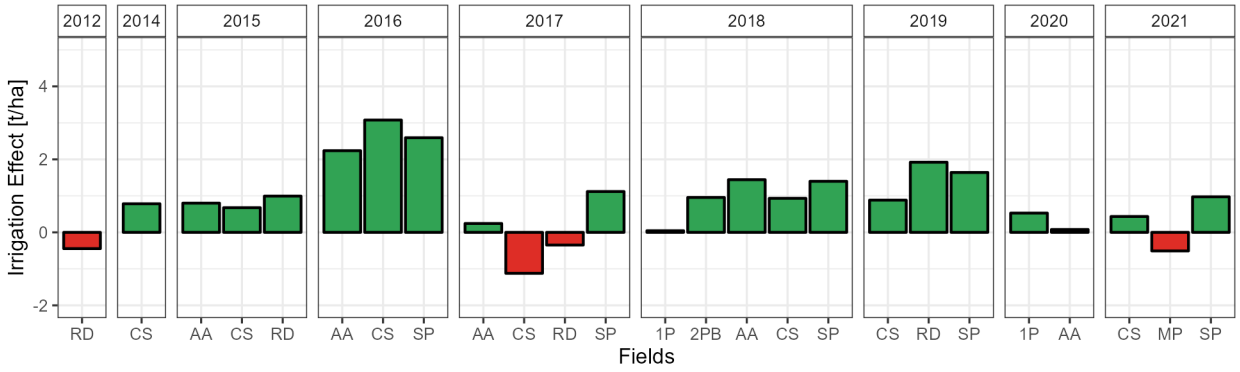

Figure 4.22: Irrigation effect in corn yield estimated with INLA analysis for the irrigated fields from 2012 to 2021.

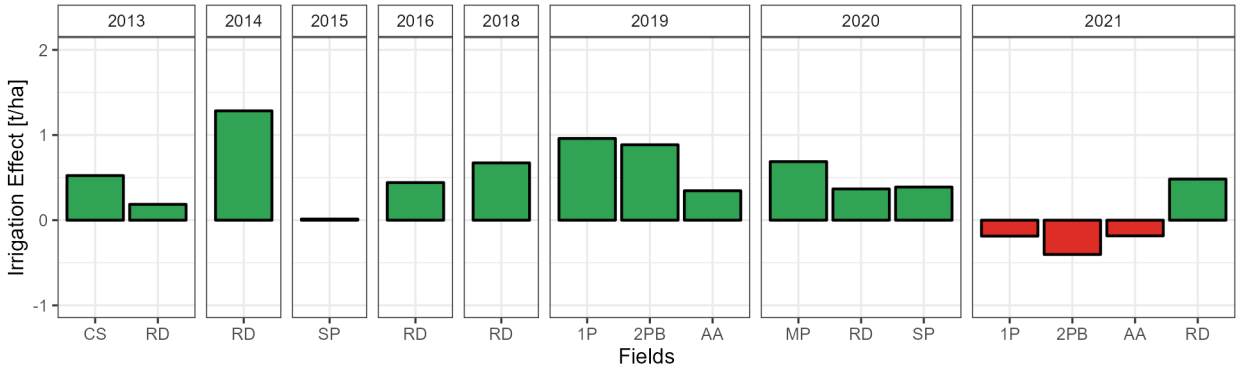

Figure 4.23: Irrigation effect in soybeans yield estimated with INLA analysis for the irrigated fields from 2013 to 2021.

The water balance was estimated per crop season (March to September) from 2012 to 2021 for corn and soybeans. We performed a linear regression analysis to explore the correlation between the water balance and the yield increase by the irrigation effect for corn (Figure 4.24A) and soybeans (Figure 4.24B). This relationship was statistically significant ($p < 0.05$). When precipitation is higher than evapotranspiration, the water balance is positive, but when precipitation is lower than evapotranspiration, the water balance is negative. Resulting in a higher water supply for plants from irrigation. As expected, in both crops, results shows when the cumulative water balance is more positive, the irrigation effect is lower, but when the water balance is more negative, the irrigation effect is higher.

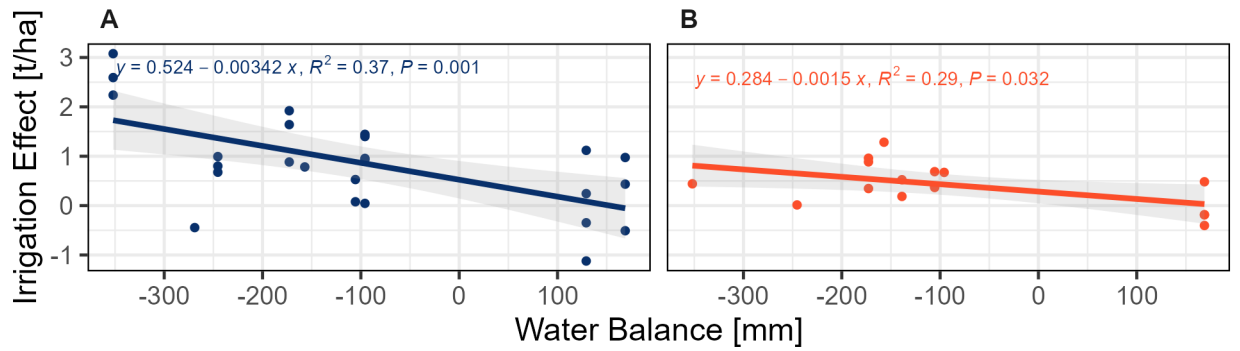

Figure 4.24: Relationship between the yield increase by the irrigation effect in corn (**A**) and soybeans (**B**) and the cumulative water balance during the crop season (March to September) from 2012 to 2021.

4.2.2 Drought Indices

A relationship between the crop yield increase produced by the irrigation effect and the drought indices and cumulative drought values per crop season were computed for corn and soybeans. The first drought index is the Palmer Drought Severity Index (PDSI) where we calculated two categories; abnormal and moderate drought. The relationship between abnormal drought and the irrigation effect on corn (Figure 4.25A) and soybeans (Figure 4.25B) yield increase and the relationship between moderate drought and the irrigation effect on corn (Figure 4.25C) and soybeans (Figure 4.25D) yield increase was not statistically significant ($p > 0.05$).

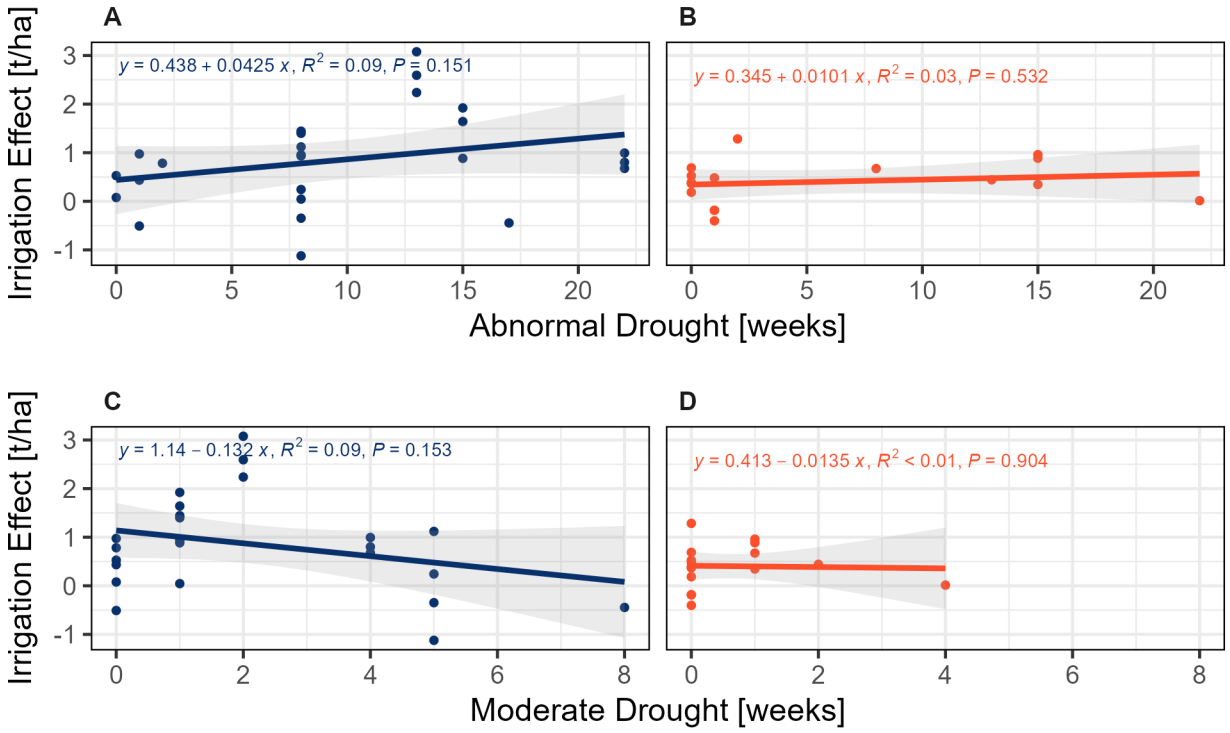

Figure 4.25: Relationship between the crop yield increase by the irrigation effect and the number of weeks of abnormal drought in corn (**A**) and soybeans (**B**), and moderate drought in corn (**C**) and soybeans (**D**) from PDSI during the crop season (March to September) from 2012 to 2021.

Likewise, the same effect is shown for the cumulative abnormal drought and the irrigation effect on corn (Figure 4.26A) and soybeans (Figure 4.26B) yield increase and the relationship between cumulative moderate drought and the irrigation effect on corn (Figure 4.26C) and soybeans (Figure 4.26D) yield increase was not statistically significant ($p > 0.05$).

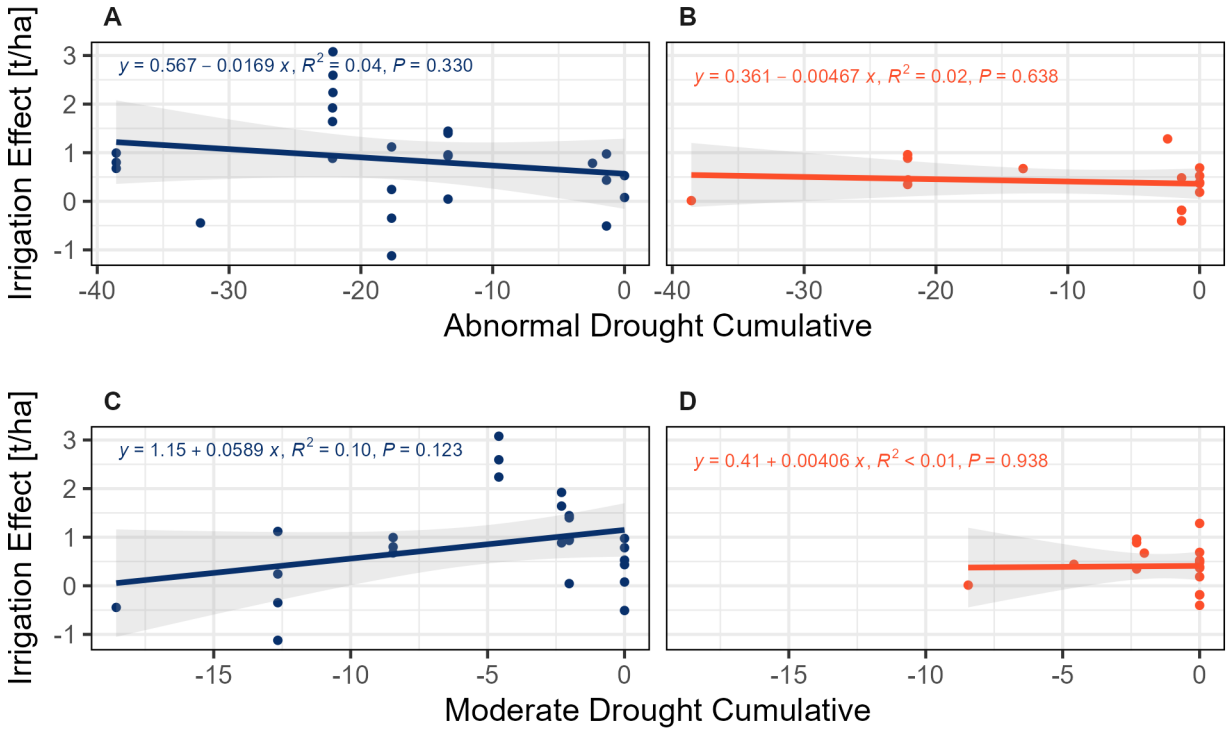

Figure 4.26: Relationship between the crop yield increase by the irrigation effect and the number of weeks of abnormal drought cumulative in corn (**A**) and soybeans (**B**), and moderate drought cumulative in corn (**C**) and soybeans (**D**) from PDSI during the crop season (March to September) from 2012 to 2021.

The second drought index is the Standard Precipitation Index (SPI) where we calculated four categories; mild, moderate, severe, and extreme drought. The relationship between mild drought (Figure 4.27A) and moderate drought (Figure 4.27C) with the irrigation effect on corn yield increase is statistically significant ($p < 0.05$), showing that when both categories are present in more months, the irrigation effect is higher. While the relationship between severe drought (Figure 4.27E) and extreme drought (Figure 4.27G) is not statistically significant ($p > 0.05$).

The relationship between mild drought (Figure 4.27B), moderate drought (Figure 4.27D), severe drought (Figure 4.27F) and extreme drought (Figure 4.27H) in soybeans yield increase is not statistically significant ($p > 0.05$). It is important to emphasize that in moderate, severe, and extreme drought the maximum number of months with those categories was 1.

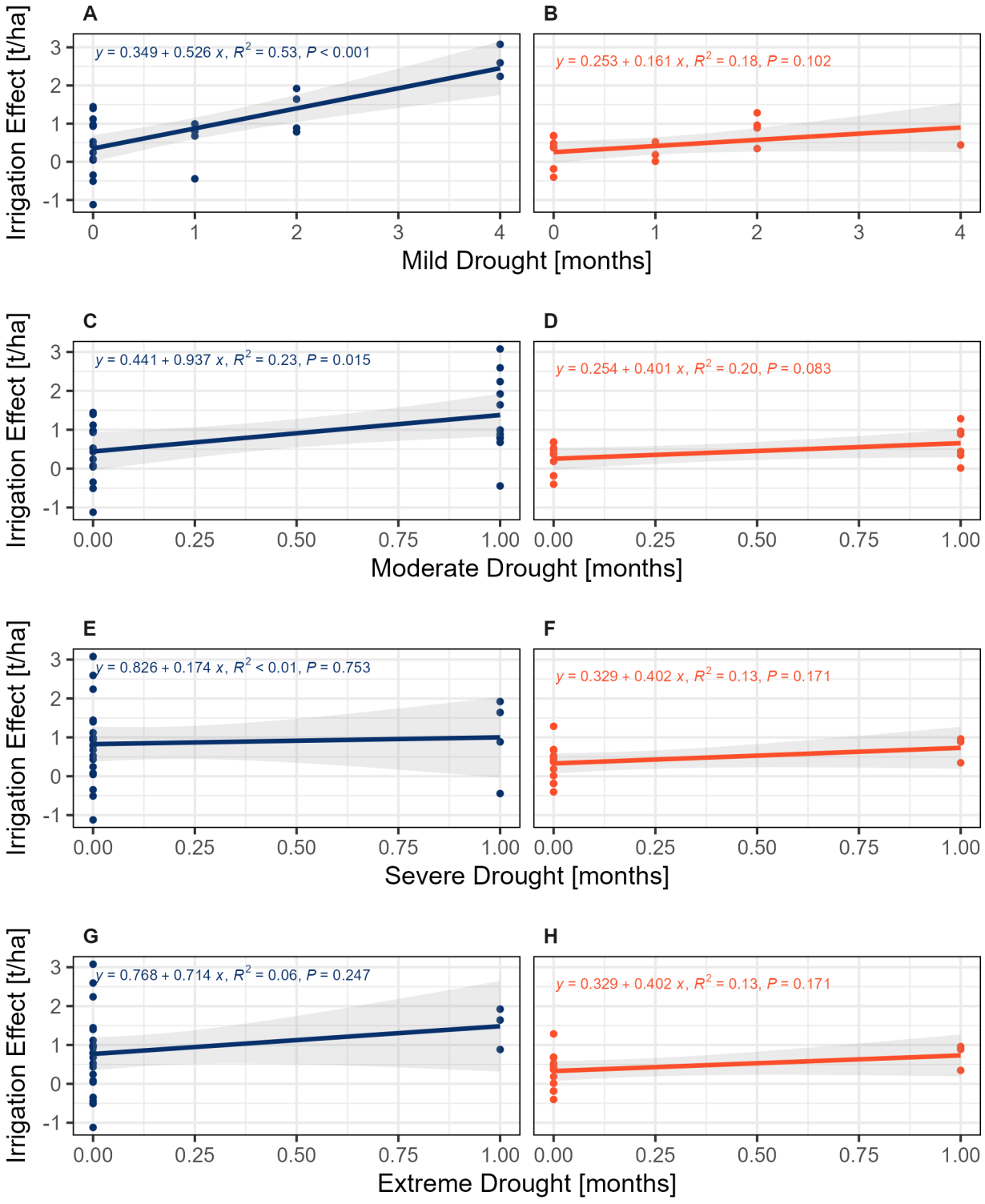

Figure 4.27: Relationship between the crop yield increase by the irrigation effect and the number of months of mild drought in corn (**A**) and soybeans (**B**), moderate drought in corn (**C**) and soybeans (**D**), severe drought in corn (**E**) and soybeans (**F**), and extreme drought in corn (**G**) and soybeans (**H**) from SPI during the crop season (March to September) from 2012 to 2021.

The relationship between cumulative mild drought (Figure 4.28A) with the irrigation effect on corn yield increase is statistically significant ($p < 0.05$), showing that when the cumulative mild drought increases, the irrigation effect is higher. While the relationship between cumulative moderate drought (Figure 4.28C), cumulative severe drought (Figure 4.28E) and cumulative extreme drought (Figure 4.28G) is not statistically significant ($p > 0.05$).

The relationship between cumulative mild drought (Figure 4.28B), cumulative moderate drought (Figure 4.28D), cumulative severe drought (Figure 4.28F) and cumulative extreme drought (Figure 4.28H) in soybeans yield increase is not statistically significant ($p > 0.05$).

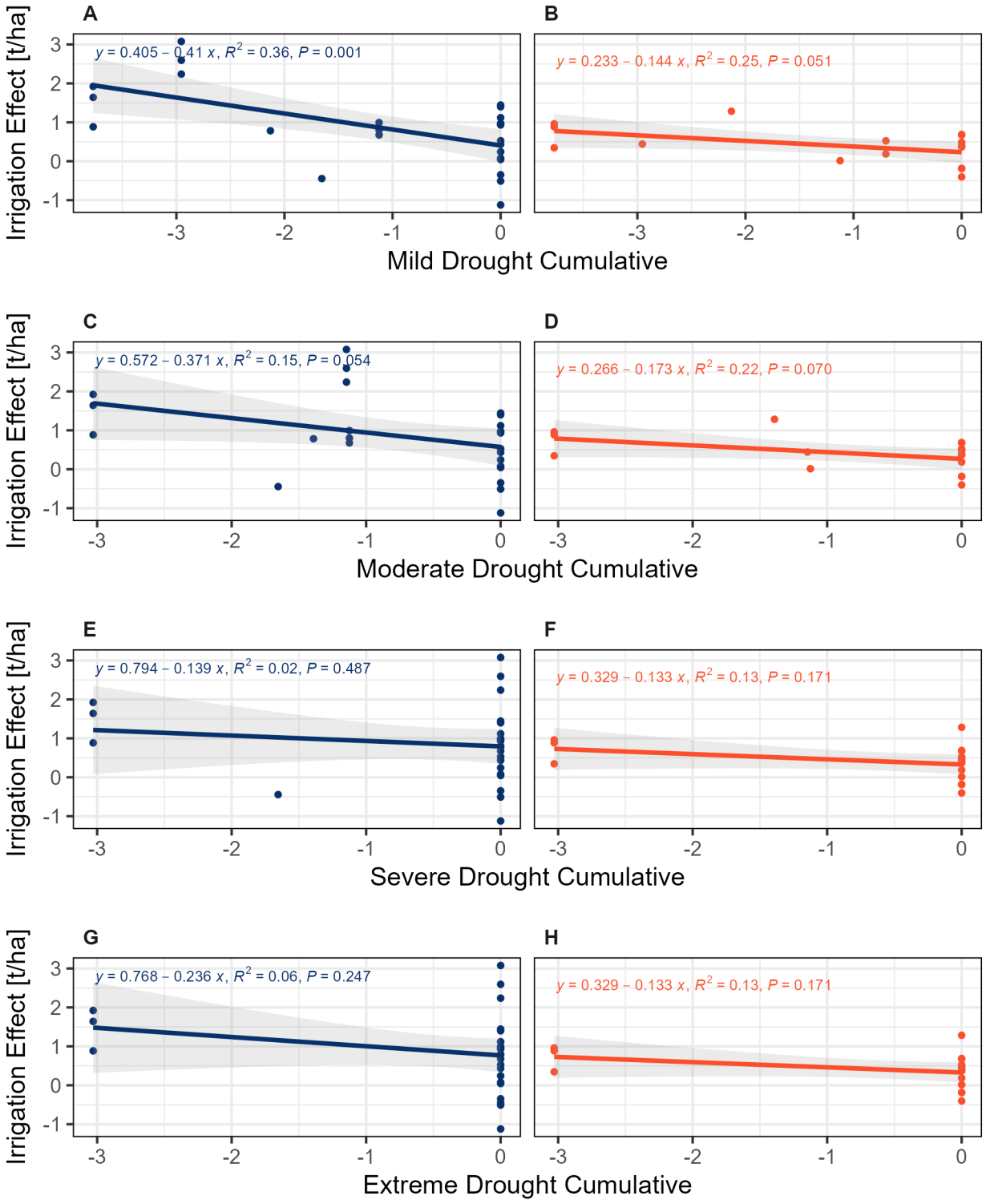

Figure 4.28: Relationship between the crop yield increase by the irrigation effect and the number of months of mild drought cumulative in corn (**A**) and soybeans (**B**), moderate drought cumulative in corn (**C**) and soybeans (**D**), severe drought cumulative in corn (**E**) and soybeans (**F**), and extreme drought cumulative in corn (**G**) and soybeans (**H**) from SPI during the crop season (March to September) from 2012 to 2021.

The third drought index is the Standard Precipitation Evaporation Index (SPEI) where we calculated four categories; mild, moderate, severe, and extreme drought (same from SPI). Extreme drought category from this index was eliminated because it was never present from 2012 to 2021. Also, it is important to emphasize severe drought was just present in 1 month during the crop season of 2012, 2015, and 2019.

The relationship between mild drought (Figure 4.29A) and moderate drought (Figure 4.29C) with the irrigation effect on corn yield increase was statistically significant ($p < 0.05$), showing that when both categories are present in more months, the irrigation effect is higher. While the relationship between severe drought (Figure 4.29E) is not statistically significant ($p > 0.05$).

The relationship between mild drought (Figure 4.29B) with the irrigation effect on soybeans yield increase is statistically significant ($p < 0.05$), showing that when this categories is present in more months, the irrigation effect is higher. While the relationship between moderate drought (Figure 4.29D) and severe drought (Figure 4.29F) in soybeans yield increase is not statistically significant ($p > 0.05$).

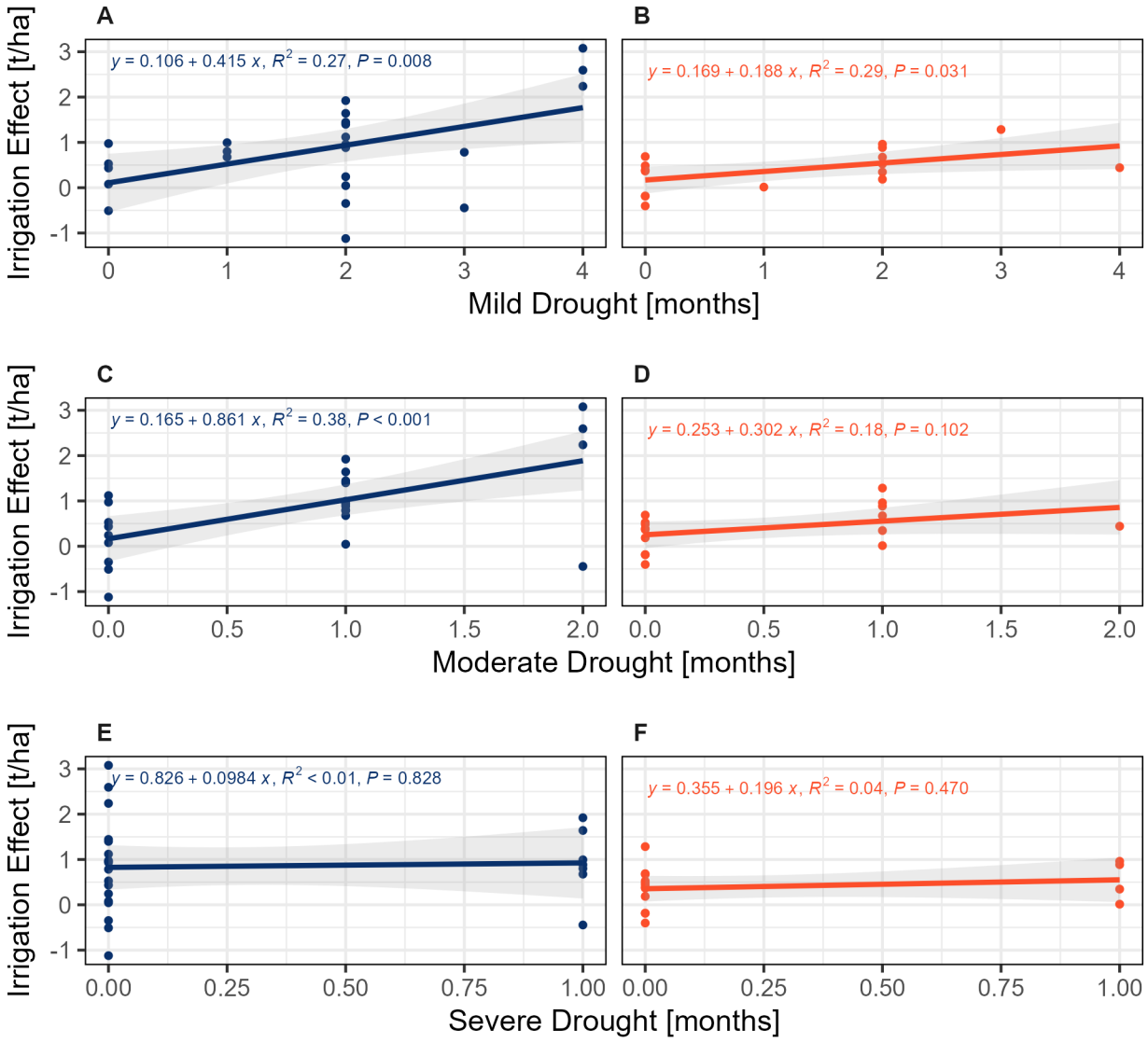

Figure 4.29: Relationship between the crop yield increase by the irrigation effect and the number of months of mild drought in corn (**A**) and soybeans (**B**), moderate drought in corn (**C**) and soybeans (**D**), severe drought in corn (**E**) and soybeans (**F**) from SPEI during the crop season (March to September) from 2012 to 2021.

The relationship between cumulative mild drought (Figure 4.30A) and cumulative moderate drought (Figure 4.30C) with the irrigation effect on corn yield increase is statistically significant ($p < 0.05$), showing that when the cumulative categories increases, the irrigation effect is higher. While the relationship between cumulative severe drought (Figure 4.30E) is not statistically significant ($p > 0.05$).

The relationship between cumulative mild drought (Figure 4.30B) with the irrigation effect on soybeans yield increase is statistically significant ($p < 0.05$). While the relationship between cumulative moderate drought (Figure 4.30D) and cumulative severe drought (Figure 4.30F) in soybeans yield increase is not statistically significant ($p > 0.05$).

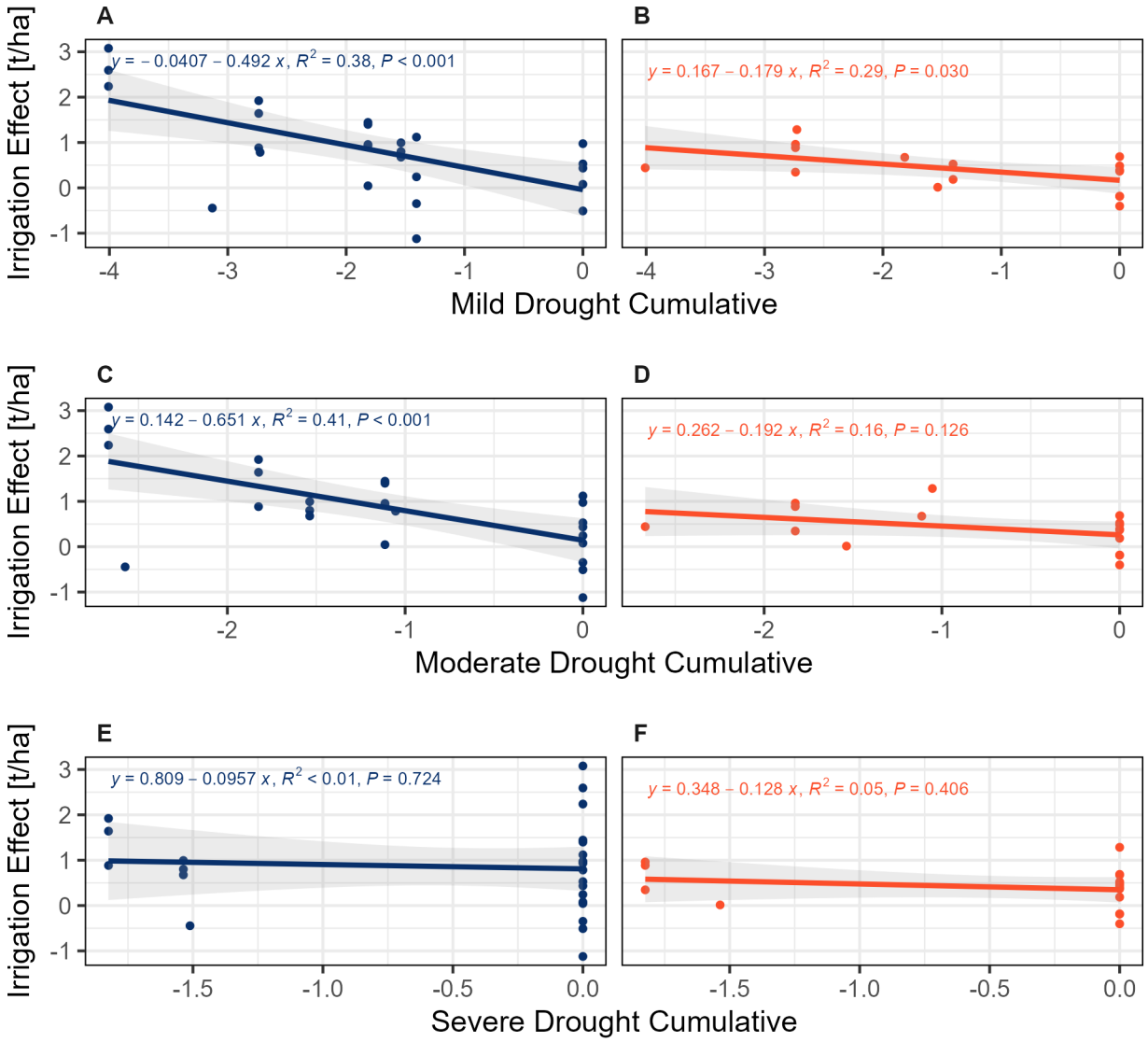

Figure 4.30: Relationship between the crop yield increase by the irrigation effect and the number of months of mild drought cumulative in corn (Figure**A**) and soybeans (**B**), moderate drought cumulative in corn (Figure**C**) and soybeans (Figure**D**), severe drought cumulative in corn (Figure**E**) and soybeans (Figure**F**) from SPEI during the crop season (March to September) from 2012 to 2021.

4.2.3 Soil and Terrain Properties

After all the models were evaluated, we eliminated the values of yield effect that exceeded the maximum yield obtained from every field and year from 2012 to 2021 for corn and soybeans. We selected the models with the lowest DIC for corn (Table 4.8) and soybeans (Table 4.9). In addition, we selected the 10 covariables with the lowest DIC for corn and soybeans to evaluate the yield effect. Results showed that AA was the best performing field in corn followed by CS, and field AA and RD in soybeans.

Table 4.8: Model with the lowest DIC per covariable in corn.

Year	**Model**	**Yield Effect [t/ha]**	**DIC**	**Covariable**	**Field**
2017	random-AR7	4.07	-193749.74	Analytical Hillshading	CS
2015	AR9	-0.04	-28129.92	Aspect	AA
2018	AR2	-0.30	-26586.67	Channel Network Base Level	AA
2017	AR3	0.74	-25311.62	Channel Network Distance	AA
2018	AR6	0.11	-25651.77	Confusion Index	AA
2018	AR5	0.27	-26810.72	Convergence Index	AA
2018	AR9	0.11	-26384.21	Entropy	AA
2016	AR8	-0.05	-26347.31	Flow Connectivity	AA
2016	random-AR10	-0.08	-27516.69	Flow Direction	AA
2015	random-AR7	0.04	-26669.63	Flow Width	AA
2016	AR9	0.11	-25551.02	Gradient Difference	AA
2018	AR9	0.04	-27767.33	LS Factor	AA
2020	random-AR2	-0.00	-26262.89	Landforms	AA
2020	random-AR10	1.03	-24690.44	Landforms TPI	AA

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Year	Model	Yield Effect [t/ha]	DIC	Covariable	Field
2018	AR2	0.15	-25637.35	Maximal Curvature	AA
2018	AR6	-0.14	-26327.14	Maximum Membership	AA
2018	random-AR2	0.08	-31656.20	Minimal Curvature	AA
2016	AR8	-0.09	-28107.59	Normalized Height	AA
2017	AR10	0.31	-26278.85	Plan Curvature	AA
2018	AR7	0.08	-28706.06	Profile Curvature	AA
2015	random-AR10	0.49	-25095.07	Relative Slope Position	AA
2017	AR9	0.17	-25993.77	Slope	AA
2020	AR1	0.33	-26543.05	Slope Height	AA
2018	random-AR6	-0.23	-25715.47	Slope Length	AA
2015	AR7	-0.02	-26547.56	Specific Catchment Area	AA
2015	random-AR8	0.52	-26667.50	Standardized Height	AA
2016	AR9	-0.04	-25779.11	Strahler Order	AA
2017	AR9	0.17	-27578.49	Stream Power Index	AA
2018	AR10	0.48	-25916.06	Topographic Position Index	AA
2016	random-AR10	0.02	-25462.85	Tangential Curvature	AA
2018	AR8	-0.46	-26280.09	Topographic Wetness Index	AA
2018	AR4	-0.25	-26299.28	Total Catchment Area	AA
2016	AR8	0.02	-26177.03	Valley Depth	AA
2015	AR4	0.12	-25389.84	bd	AA
2018	AR8	-0.42	-25647.11	Clay	AA

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Year	Model	Yield Effect [t/ha]	DIC	Covariable	Field
2015	AR2	-0.49	-26645.85	Soil Series	AA
2017	AR8	-0.44	-26600.22	Bubbling Pressure	AA
2018	AR8	0.30	-26371.66	Saturated Hydraulic Conductivity	AA
2020	random-AR7	0.38	-25043.35	Pore Size Distribution Index	AA
2015	AR7	-0.00	-25423.50	Map Unit Name	AA
2016	AR10	0.01	-26062.36	Measure of the Pore Size Distribution	AA
2020	AR6	-0.34	-25636.41	Organic Matter	AA
2020	random-AR10	0.70	-25402.85	Particle Size famamily	AA
2018	random-AR9	0.08	-24952.00	pH	AA
2018	AR5	0.57	-26097.75	Sand	AA
2018	AR2	0.07	-25095.64	Topographic Wetness Index	AA
2016	AR7	0.01	-26072.68	Taxonomic Class Name	AA
2018	random-AR4	0.00	-26142.91	Great Group	AA
2017	random-AR8	0.06	-28792.79	Order	AA
2016	random-AR6	0.00	-26112.25	Taxonomic Suborder	AA
2018	AR8	0.33	-25881.60	Textural Class	AA
2018	AR9	-0.62	-25815.91	Permanent Wilting Point	AA
2018	AR9	-0.54	-26209.96	Field Capacity	AA

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Year	Model	Yield Effect [t/ha]	DIC	Covariable	Field
2018	random-AR8	-0.64	-25495.27	Residual Soil Water Content	AA
2018	random-AR3	-0.26	-26230.47	Saturated Soil Water Content	AA

Table 4.9: Model with the lowest DIC per covariable in soybeans.

Year	Model	Yield Effect [t/ha]	DIC	Covariable	Field
2019	random-AR7	-0.03	-26118.08	Analytical Hillshading	AA
2021	AR2	0.02	-25513.61	Aspect	AA
2021	random-AR9	-0.06	-25010.65	Channel Network Base Level	AA
2019	AR8	-0.01	-25336.78	Channel Network Distance	AA
2021	random-AR7	0.00	-25146.16	Confusion Index	AA
2021	random-AR7	0.06	-25716.53	Convergence Index	AA
2021	AR2	0.01	-25245.18	Entropy	AA
2019	random-AR5	-0.01	-25488.93	Flow Connectivity	AA
2021	random-AR7	0.01	-25024.80	Flow Direction	AA
2019	AR6	-0.01	-25392.49	Flow Width	AA
2019	random-AR9	0.05	-24005.98	Gradient Difference	AA
2019	random-AR9	0.01	-23626.13	LS Factor	AA
2019	AR6	-0.00	-24989.22	Landforms	AA
2021	random-AR9	0.08	-24392.76	Landforms TPI	AA
2019	AR8	0.01	-26077.39	Maximal Curvature	AA

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Year	Model	Yield Effect [t/ha]	DIC	Covariable	Field
2019	AR2	-0.01	-25452.39	Maximum Membership	AA
2014	AR5	0.02	-25427.40	Minimal Curvature	AA
2019	AR5	-0.02	-25166.42	Normalized Height	AA
2014	AR5	0.04	-25558.48	Plan Curvature	AA
2019	random-AR10	0.02	-25250.55	Profile Curvature	AA
2014	AR2	0.01	-25651.74	Relative Slope Position	AA
2021	AR8	0.01	-25565.43	Slope	AA
2021	AR10	0.05	-25178.16	Slope Height	AA
2019	AR7	-0.03	-24251.00	Slope Length	AA
2021	AR2	0.01	-25676.57	Specific Catchment Area	AA
2021	AR2	0.05	-24682.14	Standardized Height	AA
2021	AR5	-0.03	-25592.78	Strahler Order	AA
2021	random-AR9	0.02	-25225.44	Stream Power Index	AA
2016	AR10	-1.16	-715606.93	Topographic Position Index	Red
2014	random-AR2	-0.00	-25328.58	Tangential Curvature	AA
2019	random-AR7	-0.07	-25119.44	Topographic Wetness Index	AA
2019	AR5	-0.06	-25942.83	Total Catchment Area	AA
2014	AR10	5.00	-175894.70	Valley Depth	AA
2019	AR9	-0.02	-25825.27	bd	AA
2014	random-AR4	-0.07	-25818.33	Clay	AA
2019	AR8	-0.10	-25663.54	Soil Series	AA

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Year	Model	Yield Effect [t/ha]	DIC	Covariable	Field
2021	AR1	-0.03	-24555.04	Bubbling Pressure	AA
2021	AR10	-0.05	-25278.22	Saturated Hydraulic Conductivity	AA
2019	AR9	0.05	-26376.32	Pore Size Distribution Index	AA
2021	random-AR10	-0.00	-25441.29	Map Unit Name	AA
2019	random-AR8	0.05	-25097.20	Measure of the Pore Size Distribution	AA
2021	random-AR7	-0.03	-26040.16	Organic Matter	AA
2014	random-AR5	0.19	-27132.32	Particle Size famamily	AA
2014	random-AR2	-0.08	-27163.75	pH	AA
2019	random-AR5	0.07	-25616.76	Sand	AA
2019	AR9	-0.02	-26248.29	Topographic Wetness Index	AA
2014	random-AR9	0.17	-23909.51	Taxonomic Class Name	AA
2021	AR9	0.00	-25795.21	Great Group	AA
2021	random-AR8	-0.00	-24265.31	Order	AA
2019	random-AR10	-0.00	-24907.73	Taxonomic Suborder	AA
2019	AR8	-0.00	-25664.05	Textural Class	AA
2019	AR5	-0.04	-25202.60	Permanent Wilting Point	AA
2019	random-AR9	-0.03	-24156.91	Field Capacity	AA
2021	AR1	0.02	-24151.24	Residual Soil Water Content	AA

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Year	Model	Yield Effect [t/ha]	DIC	Covariable	Field
2019	AR10	0.02	-25784.82	Saturated Soil Water Content	AA

Results show that in corn (Figure4.31) seven out of ten covariables had a positive effect on yield and three out of the ten covariables had a negative effect. Results shows that terrain variables have a highest effect on corn yield with nine out of ten covariables, and soil properties with one out of ten. The covariable with the highest positive yield effect is analytical hilllshading, producing a yield increase of 4.06 t/ha, while the covariable with the highest negative yield effect is normalized height, producing a yield decrease of 0.09 t/ha or 81.60 kg/ha.

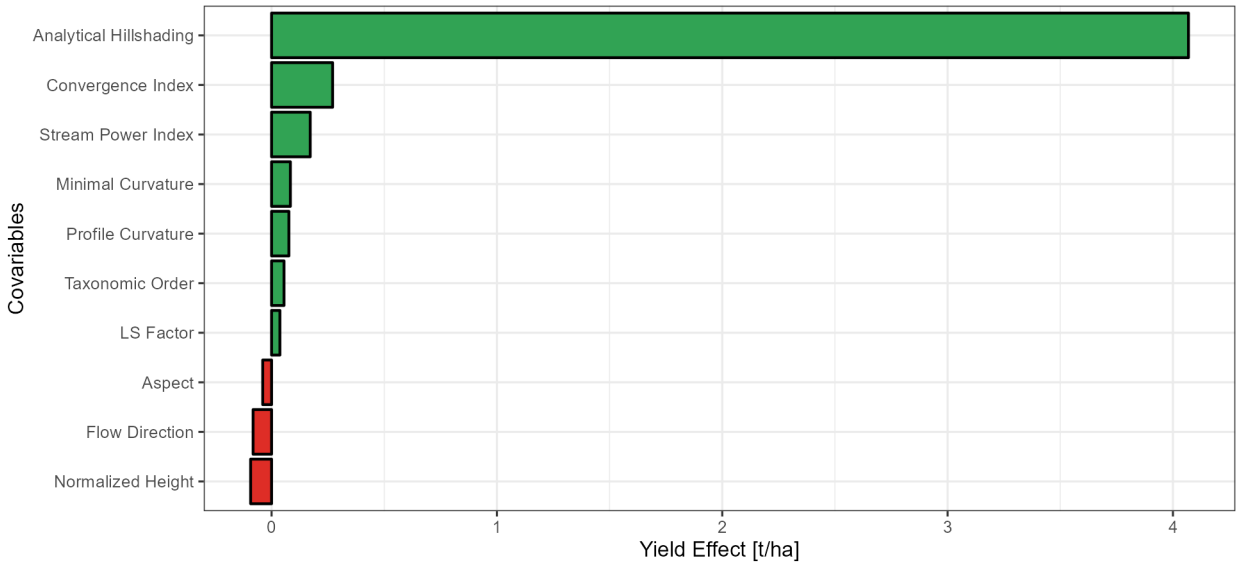

Figure 4.31: Covariables with the lowest DIC regarding the model evaluated in the INLA analysis in corn.

Analytical Hillshading

Results from INLA analysis shows that analytical hillshading is the first covariable with the highest positive effect on corn yield. This effect is 4.06 t/ha as shown in Figure 4.32. This terrain variable

produces a representation of the terrain surface based on the light source and the slope and aspect of the elevation surface (*Hillshade function*, n.d.).

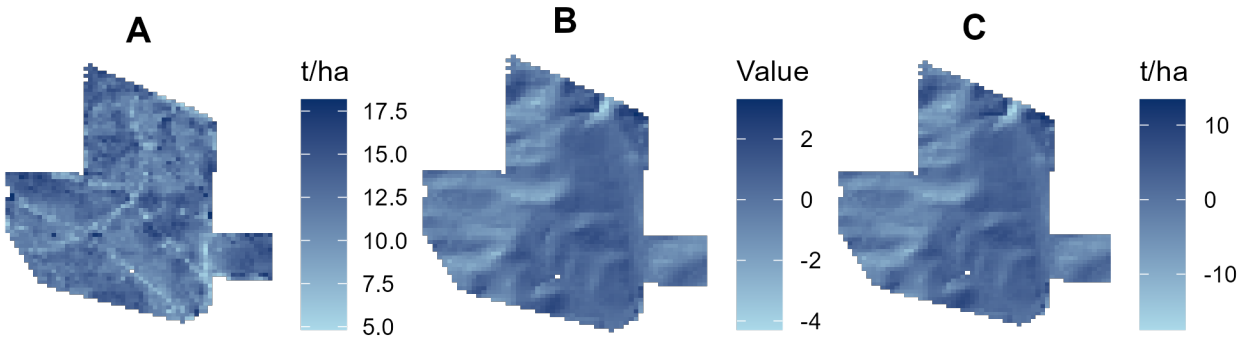

Figure 4.32: **A.** Map of corn yield from 2017 in CS field. **B.** Map of the Analytical Hillshading in CS field. **C.** Map of the Analytical Hillshading effect on corn yield in 2017 in field CS.

Convergence Index

Results from INLA analysis shows that convergence index is the second covariable with the highest positive effect on corn yield. However, this effect is just 0.27 t/ha as shown in Figure 4.33. It is a terrain variable that represents the structure of the relief in convergence areas or channels and in divergence areas or ridges (Dietrich & Böhner, 2008). It is similar to plan horizontal curvature. The results are in percentage, with negative values indicating convergent flow and positive values indicating divergent flow. A value of -100 reflects the apex of a cone, +100 is a pit, and a value of 0 represents an even slope.

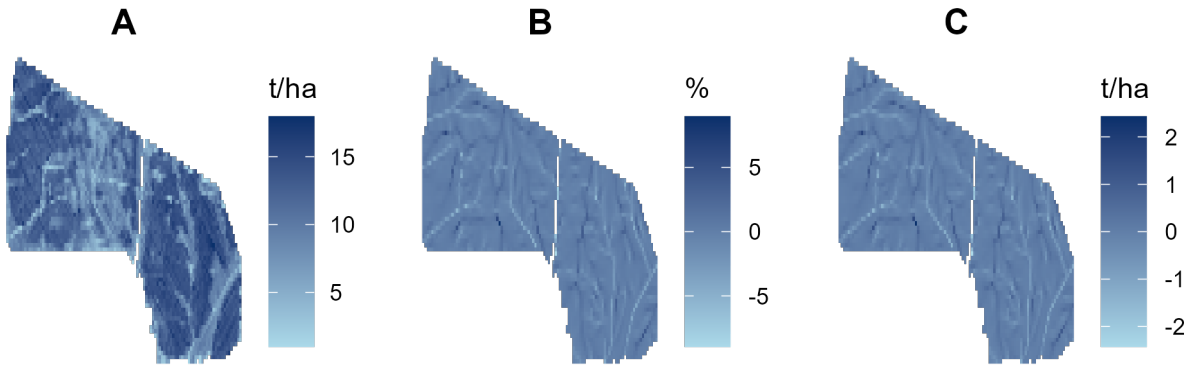

Figure 4.33: **A.** Map of corn yield from 2018 in AA field. **B.** Map of the convergence index in AA field. **C.** Map of the Convergence Index effect on corn yield in 2018 in field AA.

Stream Power Index (SPI)

Results from INLA analysis shows that SPI is the third covariable with the highest positive effect on corn yield. However, this effect is just 0.17 t/ha as shown in Figure 4.34. This terrain variable represents the erosive power of the flowing water (Wilson & Gallant, 2000) based on the the specific catchment area and the slope gradient (Sevgen, Kocaman, Nefeslioglu, & Gokceoglu, 2019). Higher values mean a higher erosive vulnerability and lower values mean low erosion vulnerability. It was defined by Moore et al. (1991) as: $SPI = A_s \cdot \tan(\beta)$. Where A_s is the specific catchment area ($m^2 m^{-1}$) and β is the slope gradient (°).

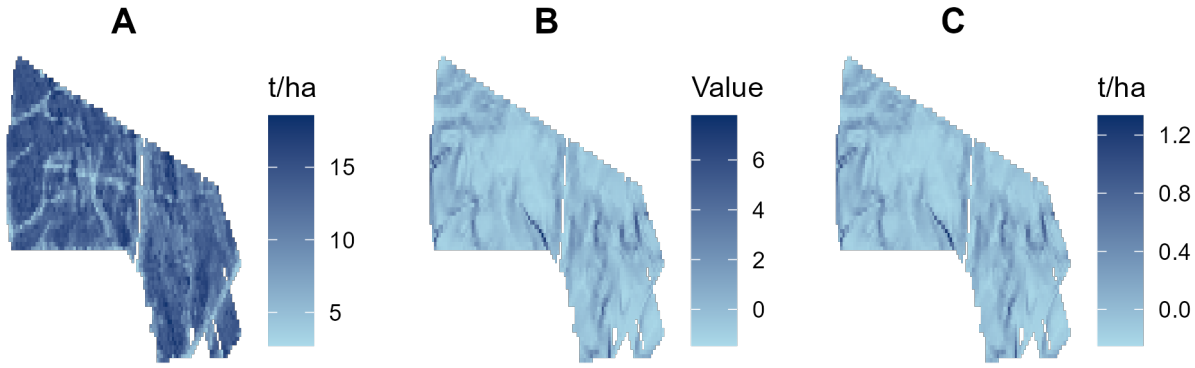

Figure 4.34: **A.** Map of corn yield from 2017 in AA field. **B.** Map of the Stream Power Index in AA field. **C.** Map of the Stream Power Index effect on corn yield in 2017 in field AA.

Minimal Curvature

Results from INLA analysis shows that minimal curvature is the fourth covariable with the highest positive effect on corn yield. However, this effect is just 0.08 t/ha as shown in Figure 4.35. This terrain variable represent the lowest value of a curvature in a given surface (Florinsky, 2016). Positive values correspond to convex areas and negative values correspond to valleys.

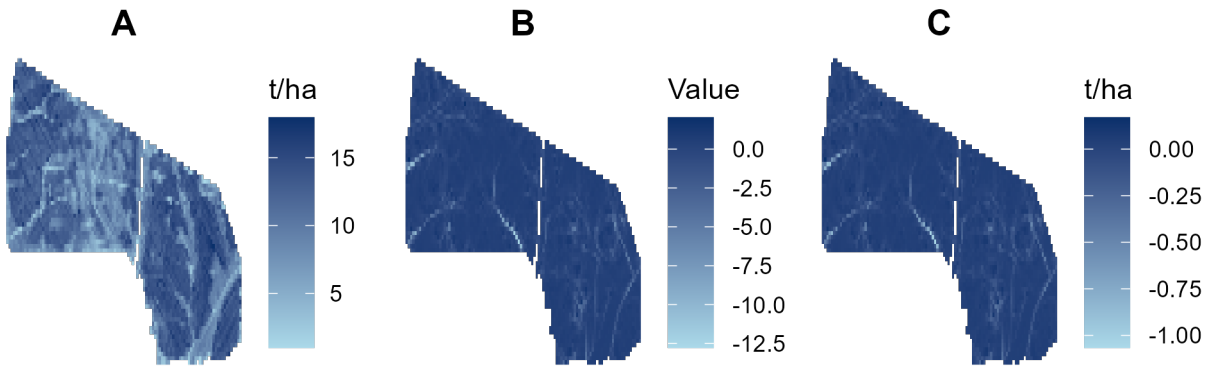

Figure 4.35: **A.** Map of corn yield from 2018 in AA field. **B.** Map of the Minimal Curvature in AA field. **C.** Map of the Minimal Curvature effect on corn yield in 2018 in field AA.

Profile Curvature

Results from INLA analysis shows that profile curvature is the fifth covariable with the highest positive effect on corn yield. However, this effect is just 0.07 t/ha as shown in Figure 4.36. This terrain variable measures the geometric curvature along a slope. It is commonly used to describe the acceleration and deceleration of flow along a surface due to the force of gravity. Where regions where the water accelerates experience erosion, whereas regions where it decelerates experience deposition (Esri, 2022). Negative values represent a convex surface, while positive values represent a concave surface, and 0 values represent no slope.

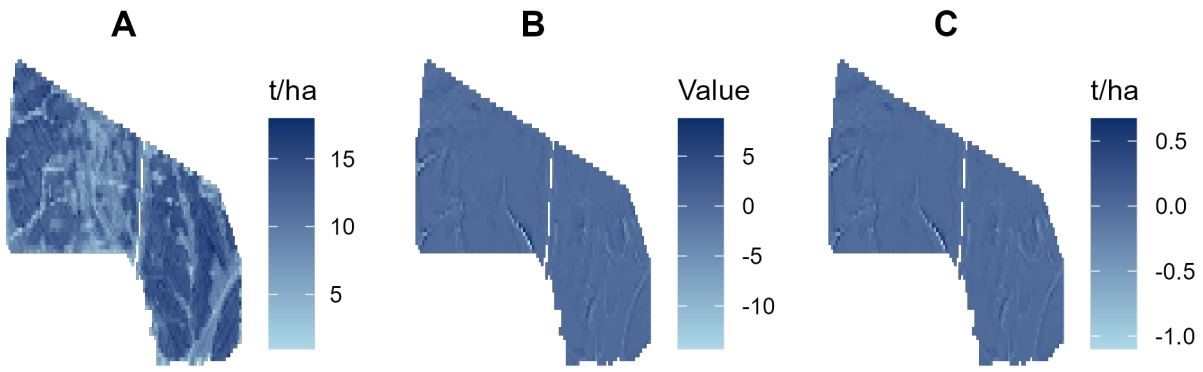

Figure 4.36: **A.** Map of corn yield from 2018 in AA field. **B.** Map of the Profile Curvature in AA field. **C.** Map of the Profile Curvature effect on corn yield in 2018 in field AA.

Taxonomic Order

Results from INLA analysis shows that profile curvature is the sixth covariable with the highest positive effect on corn yield. However, this effect is just 0.05 t/ha. This variable represent the three different taxonomic orders present in the field (Figure 4.37).

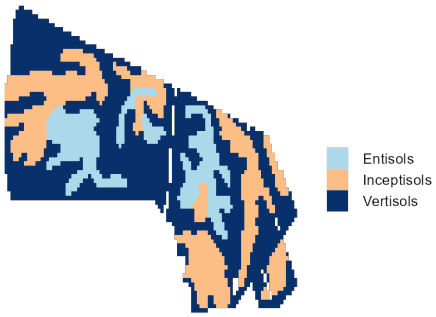

Figure 4.37: Map of the taxonomic order presents in AA field.

LS-Factor

Results from INLA analysis shows that LS-Factor is the seventh covariable with the highest positive effect on corn yield. However, this effect is just 0.03 t/ha (Figure 4.38). This variable computes the effect slope length and slope steepness on erosion. It is part of the Universal Soil Loss Equation

(USLE) and the Revised Universal Soil Loss Equation (RUSLE). It can estimate hillslope erosion (Yang, 2015). Also, it can be classified into different categories(Nagaraju et al., 2011) as described in table 4.10.

Table 4.10: Estimated classification of LS factor.

Class and Gradient
Moderately steeple slope (15-30%)
Moderate slope (5-10%)
Gentle slope (3-8%)
Very gentle slope (1-3%)

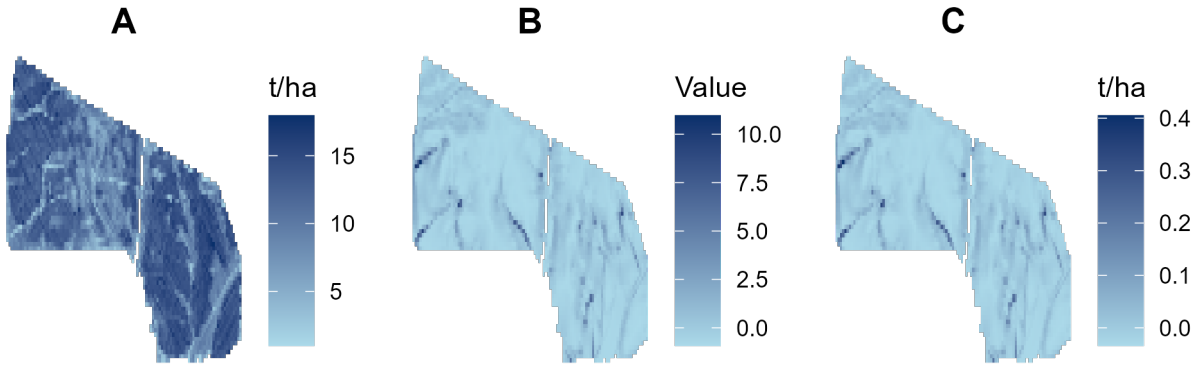

Figure 4.38: **A.** Map of corn yield from 2018 in AA field. **B.** Map of the LS-Factor in AA field. **C.** Map of the LS-Factor effect on corn yield in 2018 in field AA.

Aspect

Results from INLA analysis shows that aspect is the eighth covariable with the highest effect on corn yield. It has a negative effect on corn yield. However, this effect is just -0.03 t/ha (Figure 4.39). This terrain variable represents the direction of the slope.

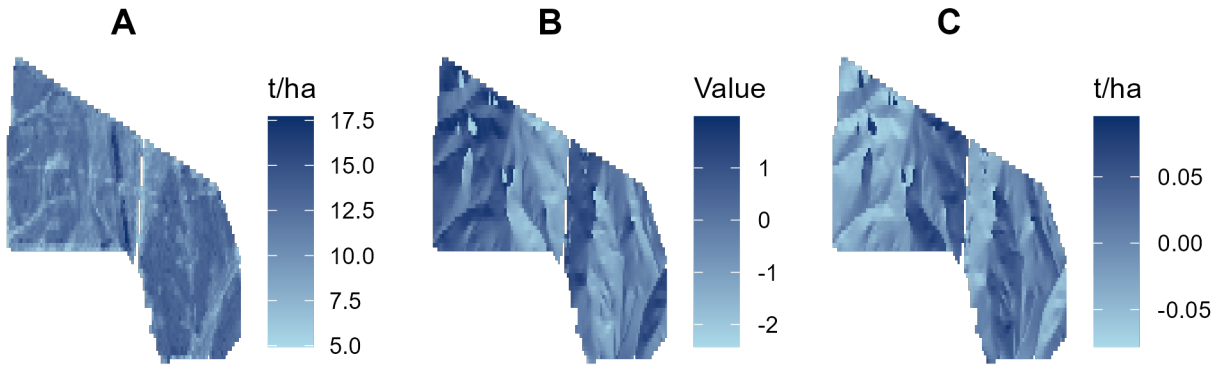

Figure 4.39: **A.** Map of corn yield from 2015 in AA field. **B.** Map of the Aspect in AA field. **C.** Map of the Aspect effect on corn yield in 2015 in field AA.

Flow Direction

Results from INLA analysis shows that flow direction is the ninth covariable with the highest effect on corn yield. It has a negative effect on corn yield. However, this effect is just -0.08 t/ha (Figure 4.40). This variable indicates the direction of the water flow.

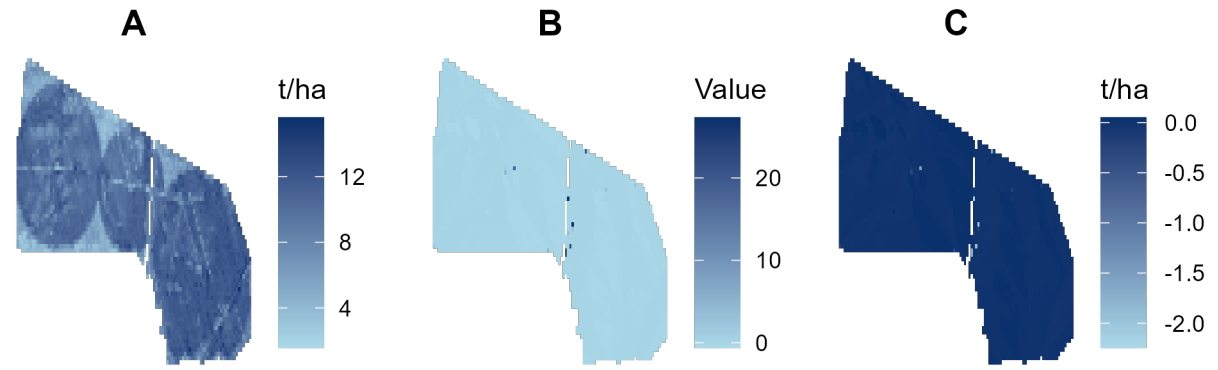

Figure 4.40: **A.** Map of corn yield from 2016 in AA field. **B.** Map of the Flow Direction in AA field. **C.** Map of the Flow Direction effect on corn yield in 2016 in field AA.

Normalized Height

Results from INLA analysis shows that normalized height is the tenth covariable with the highest effect on corn yield. It has a negative effect on corn yield. However, this effect is just -0.09 t/ha (Figure 4.41). This covariable represents the relative elevation of each pixel within a area (Böhner

& Selige, 2006). It can be used to determine the hillslope position. Values closer to 1 are the highest parts and values closer lower than 0 are the lowest parts.

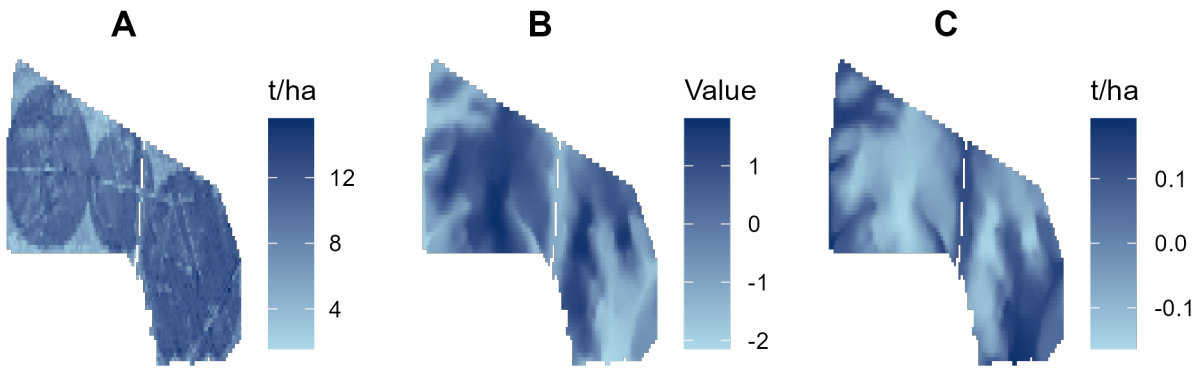

Figure 4.41: **A.** Map of corn yield from 2016 in AA field. **B.** Map of the Normalized Height in AA field. **C.** Map of the Normalized Height effect on corn yield in 2016 in field AA.

In soybeans (Figure4.42) five out of ten covariables had a positive effect on yield and 5 out of the 10 covariables had a negative effect. Withing those variables, five out ten covariables were soil properties, and five out of ten covariables, were terrain properties. The covariable with the highest positive yield effect was valley depth, producing a yield increase of 5 t/ha, while the covariable with the highest negative yield effect is Topographic Position Index (TPI) in 2016 producing a yield decrease of 1.16 t/ha.

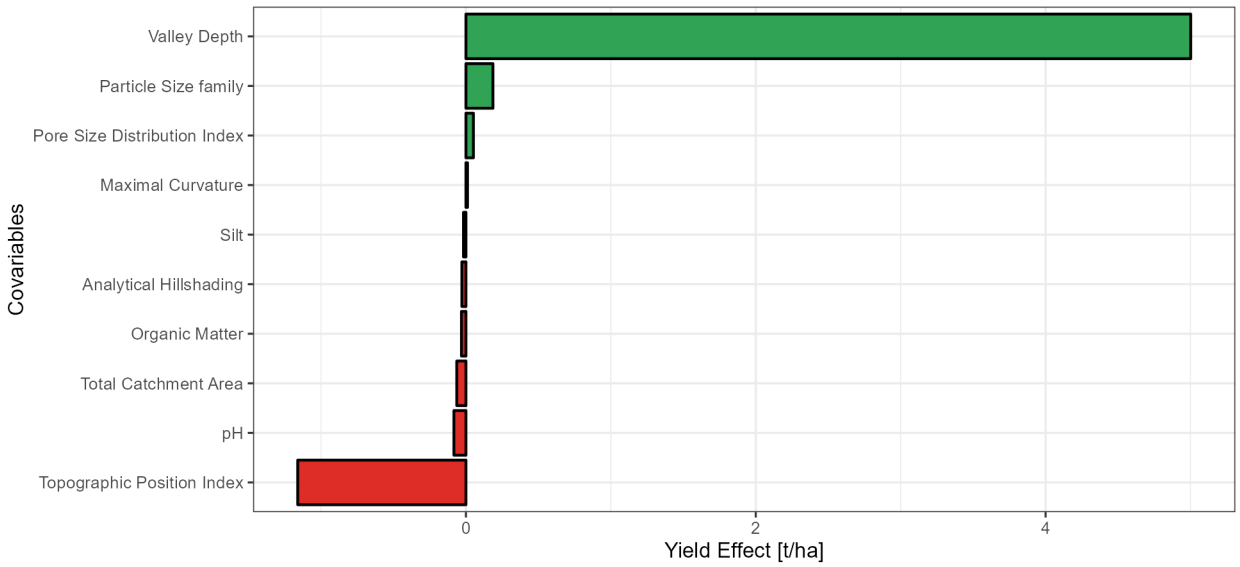

Figure 4.42: Covariables with the lowest DIC regarding the model evaluated in the INLA analysis in soybeans.

Valley Depth

Results from INLA analysis shows that valley depth is the first covariable with the highest positive effect on soybeans yield. The effect is 5.00 t/ha (Figure 4.43. This covariable represents the difference between the elevation and a ridge level (Böhner & Selige, 2006). It is ”inverse of vertical distance to channel network” (Furze, O’Sullivan, Allard, Pronk, & Curry, 2021). Higher values mean areas with lower altitudes and lower values mean areas with higher altitudes.

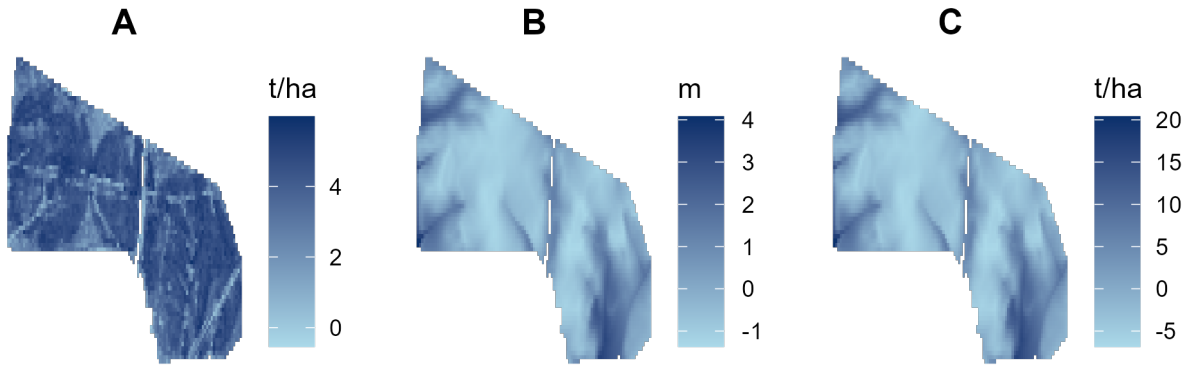

Figure 4.43: **A.** Map of soybeans yield from 2014 in AA field. **B.** Map of the Valley Depth in AA field. **C.** Map of the Valley Depth effect on soybeans yield in 2014 in field AA.

Particle Size Family

Results from INLA analysis shows that particle size family is the second covariable with the highest positive effect on soybeans yield. The effect is 0.18 t/ha (Figure 4.44). The map contains the different types of particle size families in the field. The fine family (particle size less than 2 mm) is the most abundant family within the field.

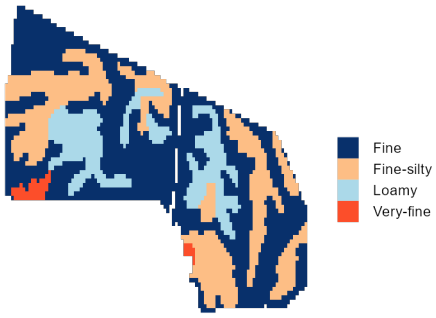

Figure 4.44: Map of the particle size families presents in AA field.

Pore Size Distribution Index

Results from INLA analysis shows that Pore Size Distribution Index is the third covariable with the highest positive effect on soybeans yield. The effect is 0.05 t/ha (Figure 4.45). The pore size distribution is the portion of pores given soil volume (Nimmo, 2004). Brooks (1965) created a empirical model to measure the distribution of pore size in a porous meadia, it is defined with the letter λ. Higher values of λ indicate uniformity in pore size, whereas lower values suggest indicates the presence of a wide range of pore sizes (Ochsner, 2019).

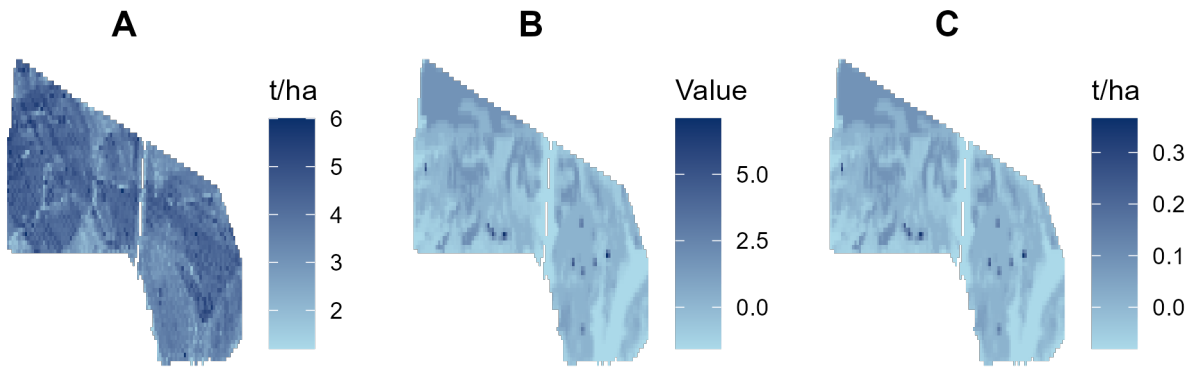

Figure 4.45: **A.** Map of soybeans yield from 2019 in AA field. **B.** Map of the Pore Size Distribution Index in AA field. **C.** Map of the Pore Size Distribution Index effect on soybeans yield in 2019 in field AA.

Maximal Curvature

Results from INLA analysis shows that maximal curvature is the fourth covariable with the highest effect on soybeans yield. The effect is 0.01 t/ha (Figure4.46). This covariable represents the maximal curvature in the terrain.

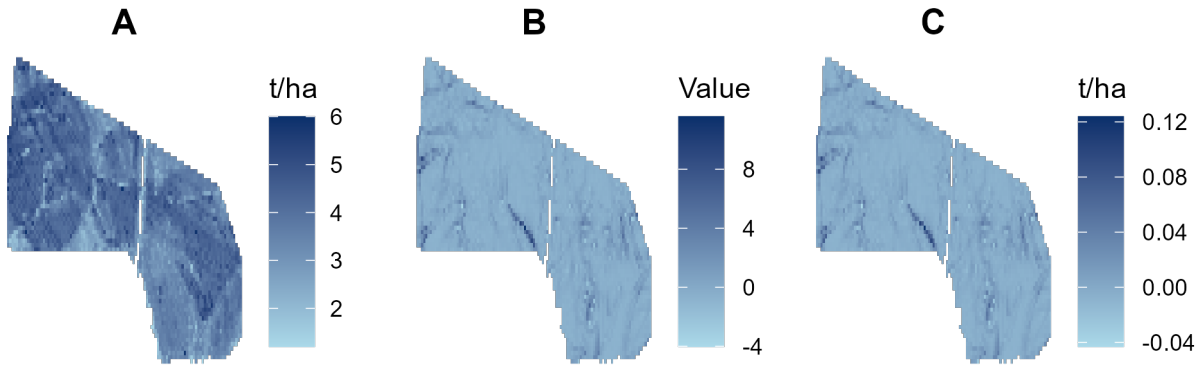

Figure 4.46: **A.** Map of soybeans yield from 2019 in AA field. **B.** Map of the Maximal Curvature in AA field. **C.** Map of the Maximal Curvatureeffect on soybeans yield in 2019 in field AA.

Silt

Results from INLA analysis shows that silt is the fifth covariable with the highest effect on soybeans yield. The effect is -0.01 t/ha (Figure 4.47). The silt content is part of the fine particle size family. Along the field it is higher in some areas and lower in some others.

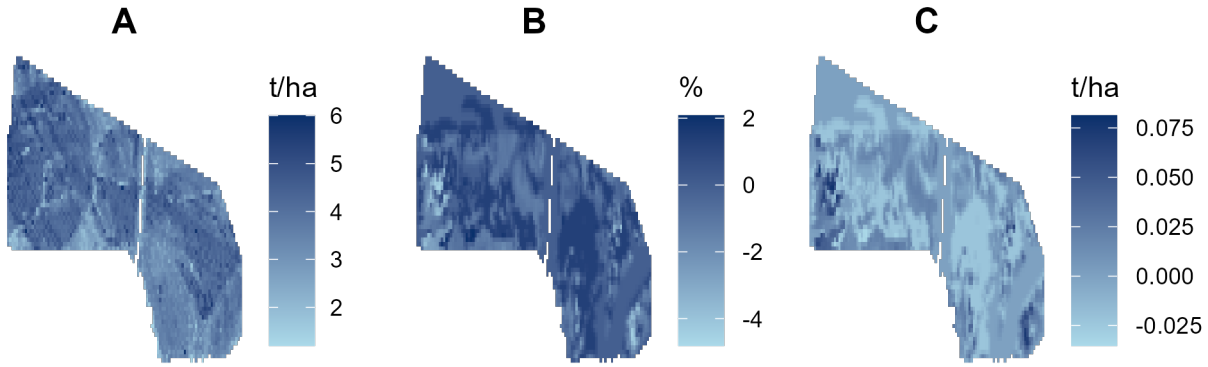

Figure 4.47: **A.** Map of soybeans yield from 2019 in AA field. **B.** Map of Silt in AA field. **C.** Map of Silt on soybeans yield in 2019 in field AA.

Analytical Hillshading

Results from INLA analysis shows that silt is the sixth covariable with the highest effect on soybeans yield. The effect is -0.02 t/ha (Figure 4.48). This terrain variable produces a representation of the terrain surface based on the light source and the slope and aspect of the elevation surface (*Hillshade function*, n.d.).

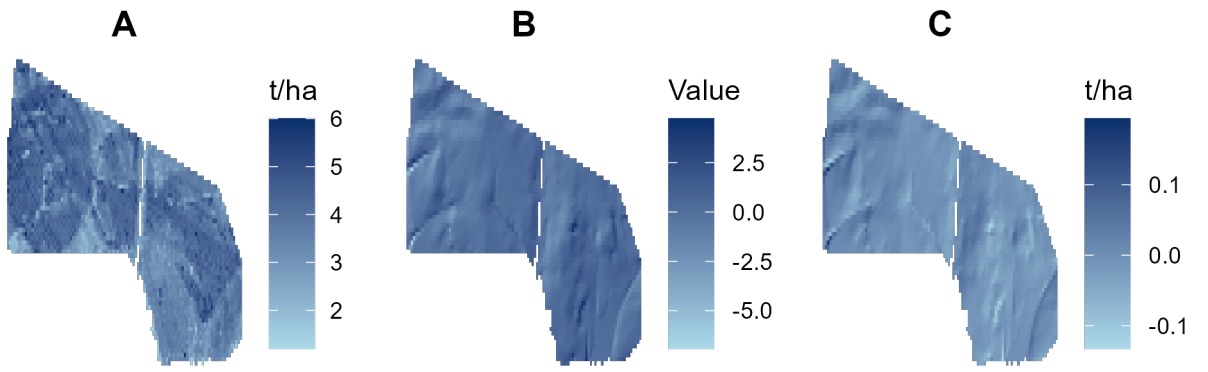

Figure 4.48: **A.** Map of soybeans yield from 2019 in AA field. **B.** Map of the Analytical Hillshading in AA field. **C.** Map of the Analytical Hillshading effect on soybeans yield in 2019 in field AA.

Organic Matter

Results from INLA analysis shows that organic matter is the seventh covariable with the highest effect on soybeans yield. The effect is -0.03 t/ha (Figure 4.49). The organic matter it is higher in areas of lower altitude along the field.

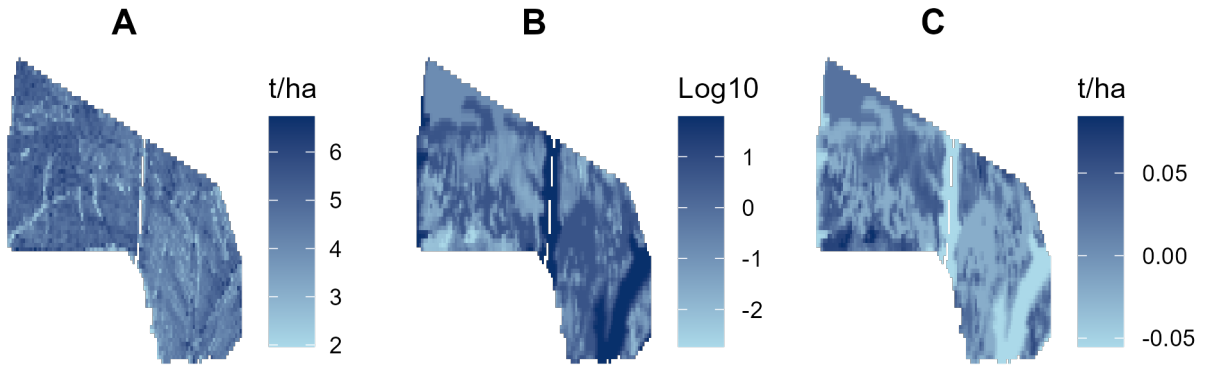

Figure 4.49: **A.** Map of soybeans yield from 2021 in AA field. **B.** Map of Organic Matter in AA field. **C.** Map of Organic Matter effect on soybeans yield in 2021 in field AA.

Total Catchment Area

Results from INLA analysis shows that organic matter is the eighth covariable with the highest effect on soybeans yield. The effect is -0.06 t/ha (Figure 4.50). This covariable is also known as the flow accumulation.

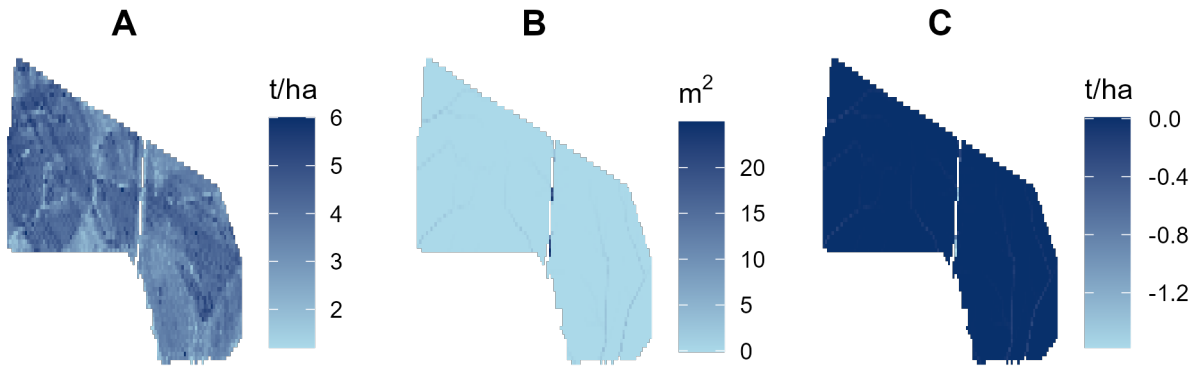

Figure 4.50: **A.** Map of soybeans yield from 2019 in AA field. **B.** Map of Total Catchment Area in AA field. **C.** Map of Total Catchment Area effect on soybeans yield in 2019 in field AA.

pH

Results from INLA analysis shows that pH is the ninth covariable with the highest effect on soybeans yield. The effect is -0.03 t/ha (Figure 4.51). The pH of the field is very alkaline due to the characteristics of the parent material. Areas of higher pH are distributed along the field, particularly located in the southeast area.

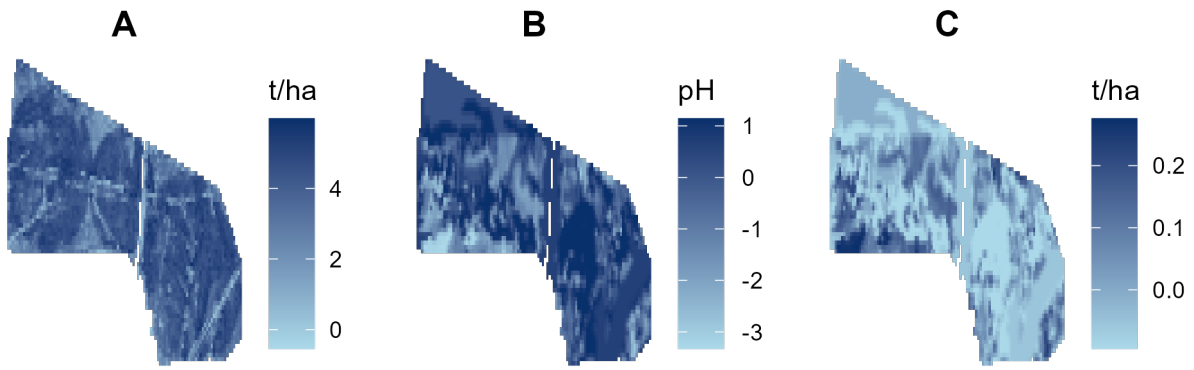

Figure 4.51: **A.** Map of soybeans yield from 2014 in AA field. **B.** Map of the pH in AA field. **C.** Map of the pH effect on soybeans yield in 2014 in field AA.

Topographic Position Index (TPI)

Results from INLA analysis shows that TPI is the tenth covariable with the highest effect on soybeans yield. The effect is -1.16 t/ha (Figure 4.52). This terrain index determines the position in the terrain evaluating the altitude of each observations with its neighborhood. More positive values represent higher areas on the landscape, whereas more negative values represent lower areas in the landscape such as valleys.

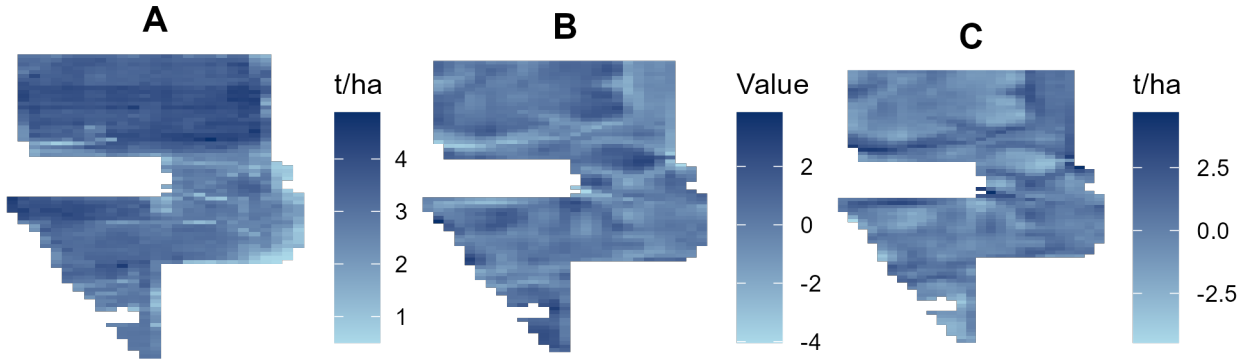

Figure 4.52: **A.** Map of soybeans yield from 2016 in RD field. **B.** Map of the Topographic Position Index in RD field. **C.** Map of the Topographic Position Index effect on soybeans yield in 2016 in field RD.

4.2.4 Discussion

The objective of this statistical analysis was to evaluate the irrigation yield effects of corn and soybeans based on terrain and soil parameters on the Alabama Blackland Prairie Region using INLA analysis through R package INLA. We have fitted different models in the data as well as evaluated different terrain and soil covariables. Here we will focus in two main discussion points; the irrigation effect in the crop yield and its relationship with drought indices and the effect of terrain and soil properties in corn and soybeans yield.

In our research, it has been demonstrated that the implementation of an irrigation system in the study area does not have a high effect on crop yield. For this reason, we accept the hypothesis that The impact of irrigation will not be considerable at the research site due to high amount of annual precipitation. In the United States about 71% of the freshwater is used for irrigation (Amarasinghe & Smakhtin, 2014). Irrigation is higher in areas of high productivity such as the corn belt, and reduced in the southeast. In Alabama, the rate of irrigation adoption remains low compared to other regions in the US despite the droughts that have occurred since early 2000's (Shange et al., 2014), but the irrigated land has increased from 53,958.76 ha in 2017 to 67,151.91 ha in 2022 (USDA, 2022).

It is well known that the implementation of an irrigation system in a field improves the crop yield while keep a better control of droughts. In 2021 the Alabama Cooperative Extension System shared information about the break-even prices of the Alabama row crops. The expected yield for various crops such as corn and soybeans from irrigated and non-irrigated farms was provided. For irrigated corn the expected yield was 15.70 t/ha and for non-irrigated corn was 7.53 t/ha and for irrigated soybeans the expected yield was 4.03 t/ha and for non-irrigated soybeans was 3.02 t/ha. The differences in crop yield from irrigated and non irrigated in areas in corn was 8.17 t/ha and 1.01 t/ha for soybeans. In our study area, the mean corn yield in irrigated fields in 2021 was 13.6 t/ha and for non-irrigated fields was 11.6 t/ha. The mean soybeans yield in irrigated fields was 4.4 t/ha and for non-irrigated fields was 4.5 t/ha. The differences in crop yield from irrigated and non irrigated in areas in corn was 2 t/ha and -0.1 t/ha for soybeans. This differences are very

low compared to the information provided by the Alabama Cooperative Extension System shared information. We attribute this results to high amount of rainfall received in that year.

Despite the high amount of rainfall, in some years, the potential evapotranspiration exceeded the amount of rain, resulting in a water deficit that was covered by irrigation (Figure 4.53). This water deficit was predominant in most of the years of our study. But in 2017 and 2021, a positive water deficit was observed, suggesting that the total amount of rainfall was higher than potential evapotranspiration, thereby resulting in a negative impact of irrigation on crop yield because they were receiving enough water from precipitation. Conversely, in 2012, where irrigation had a slightly negative impact on corn yield, the water deficit was negative. The right irrigation effect is difficult to estimate because we do not have the amount of water applied through irrigation. In addition, we attribute these differences to various factors such as pests, uneven distribution of fertilizers, among others.

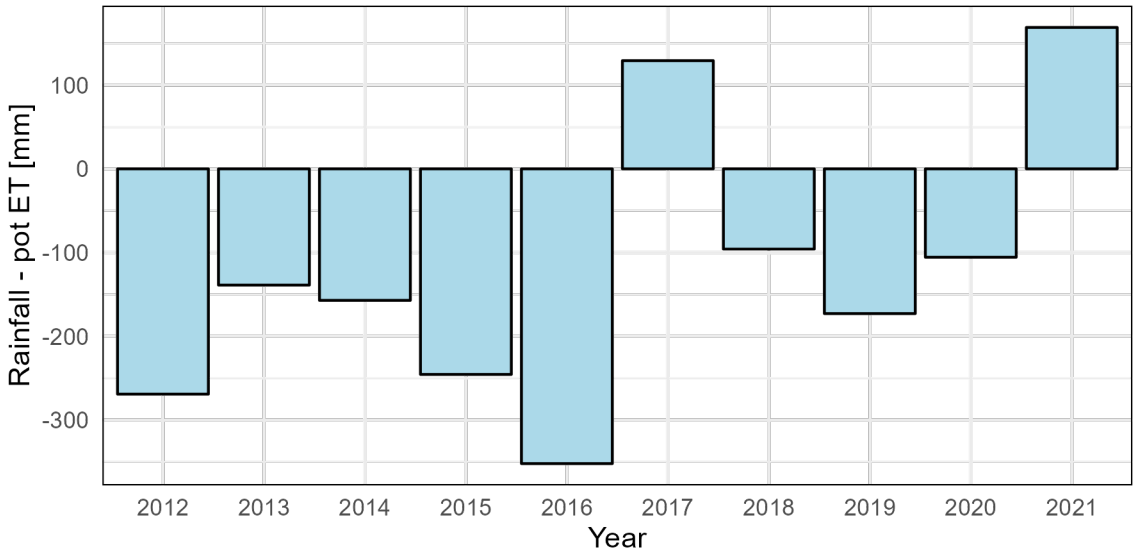

Figure 4.53: Atmospheric Water Deficit (Rainfall-Potential Evapotranspiration).

In our study, we evaluated the relationships between three drought indices and the yield increase by the irrigation effect. The relationship between the PDSI and the irrigation effect on corn yield was higher when the number of weeks with abnormal drought increased, on the contrary, the irrigation effect was lower where the number of weeks with moderate drought increased the same

trend was obtained for the cumulative drought index in both categories. Same trend was showed in soybeans but the impact was minimum. In the SPI and SPEI, in both crops where the drought per category and the cumulative drought per category increased the irrigation effect was higher.

We attribute this differences in the time scale of the drought. (Peña-Gallardo, Vicente-Serrano, Domínguez-Castro, & Beguería, 2019) found that drought indices calculated at multiple timescales such as SPEI, SPI, and PDSI, were more effective in capturing the influence of climate on crop yields compared to drought indices of one scale such as PDSI. Same results were found by Peña-Gallardo et al. (2018), that mentioned that shorter drought timescales are more effective in detecting the effects of drought on crop yields. Although he demonstrated the lower performance of the Palmer drought indices, it remains among one of the most widely accepted indices. The relationship between the drought indices and the crop yield increase by the irrigation effect was different in both crops. These droughts affect more corn yield than soybeans yield, we attribute this trend to the difference of sensitivity to drought between both crops. This tendency can be explained by the physiological differences between the two crops, with corn exhibiting a greater dependency of water compared to soybeans. However, identifying the most suitable drought index for a specific crop and region is challenging because each crop's response to drought varies based on its sensitivity to moisture scarcity and the environmental conditions (Mavromatis, 2007).

The impact of precipitation, geography, and soil factors on crop yield has been demonstrated throughout the years. These effects are reflected along a field where we find differences on crop yield, with areas of high yield production or areas of a very poor performance attributed to the spatial variability in the terrain. The combination of larger datasets of soil and terrain variables enables a better understanding of the spatial variability in corn and soybeans yield (Kaspar et al., 2004) that provide information useful for site-specific management. Furthermore, it has been shown that the characteristics of the terrain are closely linked to both agricultural productivity and the levels of nutrients in crops Kumhálová et al. (2011). The vertisols present a high water holding capacity, moderate to poor drainage, and moderate to rapid runoff that tend drop in oxygen content (Bergtold & Sailus, 2020).

Over the years, several authors have demonstrated that terrain attributes such as elevation have a high influence on crop yield (Kravchenko & Bullock, 2000). Similarly, slope and curvature directly affect the processes of infiltration and runoff. Negative curvature increases runoff, while positive curvature reduces infiltration (Daniels et al., 1987). For instance, Kaspar et al. (2004) found that soybeans were more affected by pH and closed depressions on dry years, but more by curvature on dry years. Yield was reduced on lower slope positions in wet years, but not on dry years. Kaspar et al. (2003) revealed that during periods of below-average precipitation, corn yield was negatively correlated with relative elevation, slope, and curvature, on the contrary, and in years with higher than normal precipitation, yield was positively correlated with relative elevation and slope.

The analysis revealed that certain terrain and soil variables have a higher effect on crop production in irrigated fields than others. These terrain and soil properties encompass features related to hydraulic properties, landform classification, soil erosion, soil texture, and pH. Corn yield has demonstrated to be more affected by terrain properties, while soybeans yields is equally affected by both soil and terrain characteristics, although most of their effect either positive or negative remains minimum. We attribute this effect to the minimum differences in slope percentage around the fields that is one of the main variables leading runoff, deposition, erosion, water content, among others. Although the fields are the same, the effect of the terrain or soil variables will be different depending of the crop. Soybeans yield was negative affected by Topographic Position Index (TPI). Mieza, Cravero, Kovac, and Bargiano (2016) found that TPI is highly correlated with yield due to its capacity to identify the terrain variability.

Landform classification and erosion significantly impact crop yield and terrain stability. For instance, profile curvature is used for soil modeling and could be affected by the neighborhood size Khanifar and Khademalrasoul (2023). Similarly, plan curvature, categorizes hillsides into concave, convex, and planar. Ohlmacher (2007) found that some hillsides with planar plan curvature are more prone to earth flows and earth slides in clayey soils, while those with concave plan curvature are slightly more prone to landslides compared to convex ones. Additionally, slope

height is another important factor influencing hazard assessment and erosion. Qiu et al. (2019) demonstrated that landslide size tends to increase when slope height increases but decrease when slope gradient increases Qiu et al. (2019). Soil erosion driven by various factors, leads to significant land degradation (Ansari & Tayfur, 2023).

The intrinsic fertility of soils also plays a fundamental role when obtaining high yields. In our case, soils around Alabama are slightly acidic except for the calcareous soil of the Blackland Prairie Region (Mitchell & Huluka, 2012) due to its calcareous parent material. Most plants need a pH between 6.0 to 7.0 to growth properly. The pH of the soils are slightly alkaline over the years, with a slight decrease from 7.28 in 2013 to 7.05 in the remaining years. Most of the soil nutrients in those pHs are available for plants, nevertheless, some nutrients such as P, Zn, Fe and Mn become more limited for plants uptake (Fernández & Hoeft, 2009).

The results obtained from the INLA analysis indicates that covariables obtained lowest DICs in different models. These models include a random effect to take into account the variation attributed to variables that are included in the model but are not our target variable.

4.3 Economic Analysis

In this section we evaluated the profitability of the implementation of a pivot irrigation system in the study area. The yield increase by the irrigation effect was obtained from the INLA analysis. From all the models evaluated in the effect of irrigation on crop yield, AR8 was the model selected due to the lowest DIC. The income was calculated multiplying the yield increase by the irrigation effect times the mean price of the commodities from 2012 to 2021 (Corn = 182.0 $/ha, Soybeans= 415.1 $/ha), then we extracted the total annual cost of the three pivot irrigation systems provided by the Alabama Cooperative Extension System to obtain the net income. In corn (Figure 4.54), in all the years the farmer lost money in cases 1 and 3, and just in 2016 in case 2 the farmer obtained profits. This year, 2016, was the year with the highest yield increase by the irrigation effect. On the other hand, in soybeans (Figure 4.55), in all the years the farmer lost money in cases 1 and 3, and just in 2014 in case 2 the farmer obtained profits.

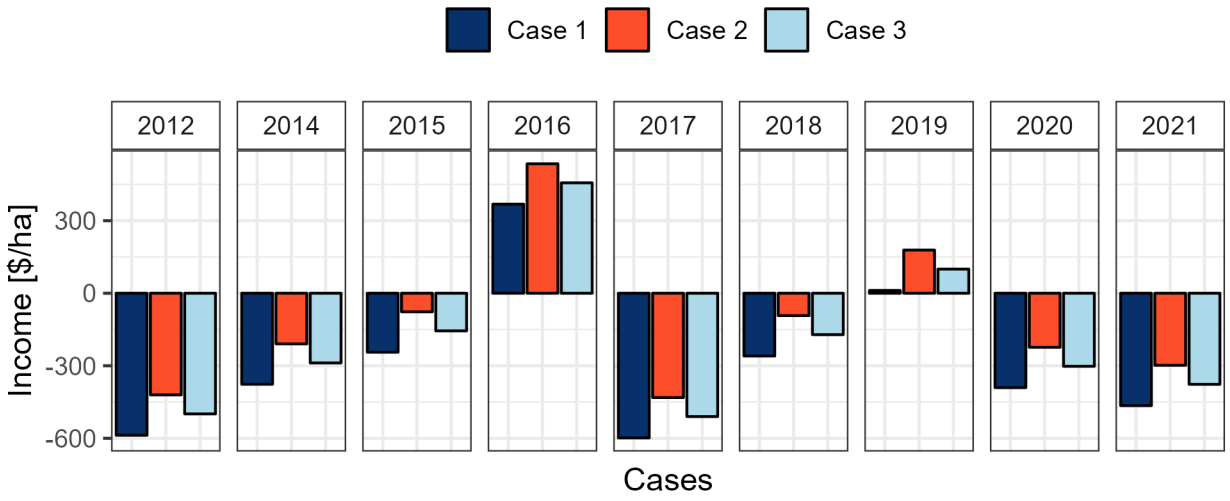

Figure 4.54: Net income produced in corn in the three cases of the pivot irrigation system.

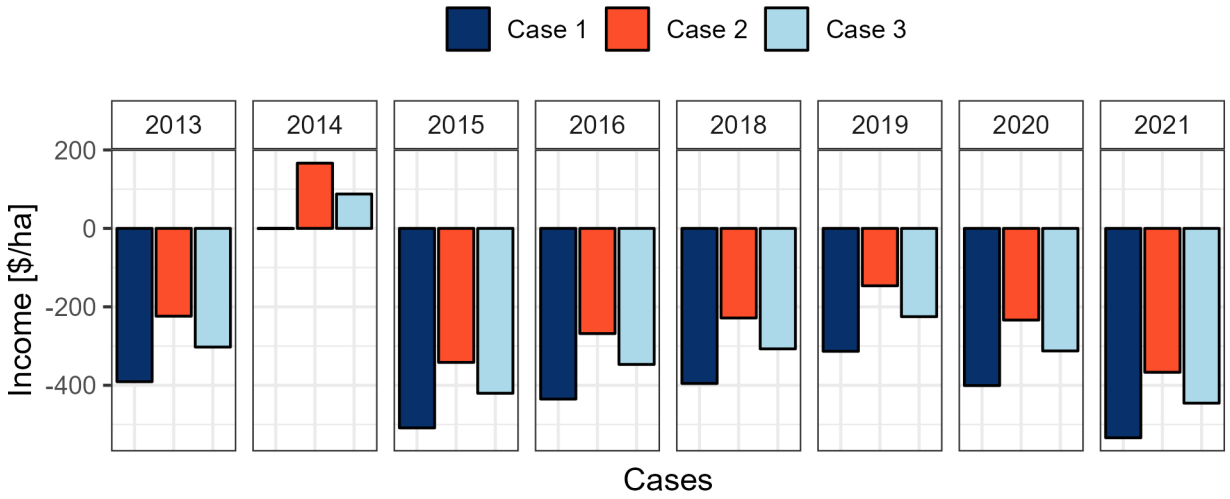

Figure 4.55: Net income produced in soybeans in the three cases of the pivot irrigation system.

4.3.1 Discussion

In this section we performed an economic analysis to determine the profitability of the implementation of an irrigation system in the research study area using INLA results. The analysis required three study cases with different total annual cost of an irrigation system provided by the Alabama Cooperative Extension.

In most of the years where the irrigation effect was positive, the economic implications of maintaining the pivot irrigation system were negative. Analysis of three cases provided by the Alabama Cooperative Extension System from 2012 to 2021 revealed that in corn the farmer obtained a net income just in 2016 in case two. The highest negative water balance was recorded in 2016, indicating that the potential evapotranspiration exceeded the precipitation. Consequently, the yield increase by the irrigation was the highest. In addition, the greatest net income was obtained in case two, because it had the lowest total annual cost among the three cases. On the other hand, in soybeans, the farmer obtained a net income just in 2014 in case two. In this year, the negative water balance also led to increased the yield with irrigation. However, other factors such as fertilizers that increase crop production where not accounted. For instance, we accept the null hypothesis that irrigation effect on crop yield in this farm in Alabama Blackland Prairie region is not greater enough to cover the total annual cost of a pivot irrigation system.

A lot of information necessary to calculate the profitability of this irrigation system was not used because it was not provided by the farmer. This information includes variables and fixed costs. From the variable costs we needed to include the seed price, fertilizers, labor, crop insurance, and some fixed costs such as the machinery depreciation. The operating cost of a center-pivot will be different from farm to farm due to factors such as the water source, the energy cost, the irrigation labor, the reparation expenses, field size, among others.

4.4 Conclusions

4.4.1 Machine Learning

- In both crop yield predictions, in all groups RF obtained the lowest mean RMSE, although not in all the groups was statistically significant different from other models.

- The accuracy of the predictions in group A is significantly influenced by the distance between the training and validation fields. However, this is not the case in group B, as some of the data from the validation field was included in the training data.

- The correlation between the number of observations and the accuracy on the predictions vary depending on the specifications of the group. In scenarios large number of observations from various years the relationship might not be statistically significant. However, when the sample size is smaller and there is a limited amount of data spanning fewer years, the amount of observations might have a statistical significant relationship.

- Group D produced the scenarios with the lowest RMSEs and higher R^2, although the computational time of every scenario increased significantly due to the number of observations, they were still computed in less than two days and were within the wall clock of ten days.

- Most of the studies found in the literature used remote sensing data to increase the accuracy on their predictions. However, in group D, we noticed that no spectral data was necessary to achieve accurate predictions, therefore, more data corresponding to different years, crops, fields, and varying distances from the training dataset improve the predictions accuracy.

- Accuracy of corn and soybeans yield predictions is lower when relying only on one year of training data where terrain attributes had a higher impact in corn and soybeans yield predictions, than soil and climate properties.

- Incorporating data from multiple fields spanning several years and diverse crop yields into the training dataset led to higher accuracy of predictions.

- Climate data is more important in crop yield predictions when several years of data are included in the training.

- When predictions are made with data from one year, terrain properties are more important than soil properties in corn and soybeans.

- The accuracy of the predictions might be affected by several factors that were not including in the data. Including different aspects of the agricultural management such as the amount of fertilizers applied to every field during the 10 consecutive years, the amount of water applied

through irrigation to every field during the crop season, the crop varieties used in every field and year, or the pests that affected the crop yield.

- In group A, in corn yield predictions terrain variables had a higher impact than soil variables, though organic matter had the highest effect. While in soybeans yield predictions, terrain properties had a greatest impact, with relative slope position having the highest effect.
- In group B, in corn and soybeans yield predictions, terrain variables had a higher impact than soil variables, although due to specifications of the group, the irrigation stand out as the variable with the highest effect in corn and soybeans yield predictions.
- In group C, in corn and soybeans yield predictions, climate variables had the highest impact.
- In group D, in corn and soybeans yield predictions, terrain variables had a high effect, climate variables played an important role due to the integration of data from multiple fields and years.

4.4.2 Integrated Nested Laplace Approximation (INLA)

- Field AA performed better than other irrigated fields. Obtaining different outstanding models in the covariables with the highest effect that suggest that variables that are not our target variable but are part of the model are being considered as random effects.
- Covariables preformed better in models that included random effects, this suggest that variables that are not our target variable but are part of the model are being considered as random effects.
- Certain soil and terrain properties on a small or big scale are affecting the crop yield. Those covariables related to hydraulic properties, landform classification, soil erosion and composition are the principal driving factors affecting the crop yield. However, the effect of these factors may vary depending on the slope gradient of the terrain.

- Some covariables had a high positive or negative effect on crop yield that just correspond to the values of the variable not to an actual effect on crop yield.
- In years when the water deficit was more negative, the irrigation effect on crop yield was higher.
- In the study area the yield increase by the irrigation effect is not significant.
- Crops respond different to droughts, where crops that have a higher water requirement are more susceptible to drought.
- Drought conditions measured on a shorter time scale have a higher relationship with crop yield
- Contrary to early assumptions that suggested a higher effect of soil properties on crop yield due to the unique characteristics of soils in the study area, it was found that terrain properties had a higher influence on corn and soybeans yield.
- Soybeans yield is affected by both, terrain properties and soil properties.
- Terrain covariables have the highest effect on corn yield.
- The high clay content of the soils in the study area did not have a high impact on crop yield.

4.4.3 Economic Analysis

- In the study site, irrigation is not required in corn and soybeans production because the differences in yield from irrigated and non irrigated fields are not significant.
- In both crops just in one year in one case the farmer obtained profits.
- Pivot irrigation systems are not profitable in the studied farm of the Blackland Prairie Region.

4.5 Limitations

- Detailed management data was not provided (i.e., crop variety, planting date, row space, amount of fertilizers applied, among others).
- Detailed irrigation data was not provided, we just knew if the field was irrigated or not. Not additional information about water management was provided (i.e., irrigation dates and depth, amount of water).
- The annual fixed cost of irrigation depends on the field size, the water source, and different characteristics of the pivot.
- Several research studies include growing season remote sensing data to calculate some vegetation index such as NDVI and VI when estimating crop yield predictions. However it was not included in our study.
- Computational time was a key factor when processing the scenarios. When we started the analysis of our scenarios, we had a pixel size of 10 m and a wall time of 30 days, unfortunately, some scenarios never finished. For this reason, we had to increase the pixel size to 30 m and modify the wall time to 10 days. Scenarios that were not completed during that time, or failed, where eliminated from the study.
- Soil data was obtained from an open source database. Not in-situ soil data was collected.
- The analysis was performed in 30 m pixel size and might not been capturing important data in a smaller pixel resolution.
- Computational times plays an important role. Normally, utilize a personal computer would take several days that in the Easley Auburn cluster would take few hours.
- High and good programming skills are required when working with big data.

- No economical information regarding to irrigation fixed or variable costs were provided by the farmer.
- Results from this study are just applicable to this farm in the Alabama Blackland Prairie Region.

4.6 Future Research Recommendations

- In crop yield predictions, the pixel size should be reduced to 10 m and remote sensing data should be implemented in the study to analyze if the accuracy of the predictions in group A and B increases.
- Other machine learning algorithms such as ANN and deep learning could be implemented to evaluate the accuracy of the predictions in group A and B.
- Yield data could be separated per growth stages to evaluate the accuracy of the predictions. Areas of higher and lower yield should be identified to perform difference analysis and analyze if the accuracy of the model improves.
- All the scenarios should be studied more in detail to observe if the most important variables obtained change between them and to find if there is a particular trend affecting those predictions.
- Other soil and terrain properties could be predicted based on the actual data. This predictions could be studied similarly to our predictions, in a group and scenario base.
- In the spatial variability assessment, every terrain and soil property should be analyzed more in detail to identify the actual effect on crop yield. Other soil and terrain properties could be used as a target variable based on the actual data. This work should be implemented using the actual pixel size, but also reducing the pixel size to 10 m.
- Soil samples should be collected in the study are to increase the accuracy of the models.

- Elevation information should be taken with a drone to increase the accuracy of the DEMs.
- This study should be replicated in other areas with similar soil, terrain, and climate characteristics. It should be replicated in areas with completely different soil, terrain, and climate variable performing the same statistical analysis to observe the differences between both.
- Select just the more important variables in crop yield predictions and in the INLA analysis to evaluate the accuracy of the results.

Appendix A

Soil characteristics of the Study Area

Table A.1: Soil characteristics of the research study area.

Field	Slope (%)	Soil series	Taxonomic order	Taxonomic suborder	Taxonomic class name
1P	0 to 2	Sucarnoochee	Vertisols	Aquerts	Fine, smectitic, thermic Chromic Epiaquerts
2PB	0 to 1	Vaiden	Vertisols	Uderts	Very-fine, smectitic, thermic Aquic Dystruderts
6	0 to 1	Leeper	Inceptisols	Aquepts	Fine, smectitic, nonacid, thermic Vertic Epiaquepts
AM	0 to 1	Leeper	Inceptisols	Aquepts	Fine, smectitic, nonacid, thermic Vertic Epiaquepts
AA	0 to 2	Sucarnoochee	Vertisols	Aquerts	Fine, smectitic, thermic Chromic Epiaquerts
BG	0 to 1	Leeper	Inceptisols	Aquepts	Fine, smectitic, nonacid, thermic Vertic Epiaquepts
BBEA	0 to 1	Leeper	Inceptisols	Aquepts	Fine, smectitic, nonacid, thermic Vertic Epiaquepts
BS	1 to 5	Houston	Vertisols	Uderts	Very-fine, smectitic, thermic Oxyaquic Hapluderts
CS	3 to 5	Faunsdale	Vertisols	Uderts	Fine, smectitic, thermic Aquic Hapluderts
CF	1 to 5	Vaiden	Vertisols	Uderts	Very-fine, smectitic, thermic Aquic Dystruderts
HB	1 to 5	Vaiden	Vertisols	Uderts	Very-fine, smectitic, thermic Aquic Dystruderts
JL	1 to 3	Faunsdale	Vertisols	Uderts	Fine, smectitic, thermic Aquic Hapluderts
MP	0 to 2	Sucarnoochee	Vertisols	Aquerts	Fine, smectitic, thermic Chromic Epiaquerts
NH	1 to 3	Vaiden	Vertisols	Uderts	Very-fine, smectitic, thermic Aquic Dystruderts
PB	1 to 5	Houston	Vertisols	Uderts	Very-fine, smectitic, thermic Oxyaquic Hapluderts
PE	1 to 5	Houston	Vertisols	Uderts	Very-fine, smectitic, thermic Oxyaquic Hapluderts
PW	0 to 1	Leeper	Inceptisols	Aquepts	Fine, smectitic, nonacid, thermic Vertic Epiaquepts
PTB	0 to 1	Leeper	Inceptisols	Aquepts	Fine, smectitic, nonacid, thermic Vertic Epiaquepts
PL	1 to 5	Houston	Vertisols	Uderts	Very-fine, smectitic, thermic Oxyaquic Hapluderts
PLB	1 to 5	Houston	Vertisols	Uderts	Very-fine, smectitic, thermic Oxyaquic Hapluderts
RD	0 to 1	Kipling	Alfisols	Udalfs	Fine, smectitic, thermic Vertic Paleudalfs
SP	3 to 8	Demopolis	Entisols	Orthents	Loamy, carbonatic, thermic, shallow Typic Udorthents

Appendix B

Datasets

B.1 Climate Data

Table B.1: Climate data from 2012 to 2021 in the study area.

Year	Variable	Value
2012	Abnormal Drought Cumulative PDSI	-32.17
2013	Abnormal Drought Cumulative PDSI	0
2014	Abnormal Drought Cumulative PDSI	-2.43
2015	Abnormal Drought Cumulative PDSI	-38.56
2016	Abnormal Drought Cumulative PDSI	-22.12
2017	Abnormal Drought Cumulative PDSI	-17.67
2018	Abnormal Drought Cumulative PDSI	-13.39
2019	Abnormal Drought Cumulative PDSI	-22.15
2020	Abnormal Drought Cumulative PDSI	0
2021	Abnormal Drought Cumulative PDSI	-1.37
2012	Moderate Drought Cumulative PDSI	-18.56
2013	Moderate Drought Cumulative PDSI	0
2014	Moderate Drought Cumulative PDSI	0
2015	Moderate Drought Cumulative PDSI	-8.45
2016	Moderate Drought Cumulative PDSI	-4.59
2017	Moderate Drought Cumulative PDSI	-12.66
2018	Moderate Drought Cumulative PDSI	-2.02
2019	Moderate Drought Cumulative PDSI	-2.30
2020	Moderate Drought Cumulative PDSI	0
2021	Moderate Drought Cumulative PDSI	0
2012	Mild Drought SPI	1.00
2013	Mild Drought SPI	1.00
2014	Mild Drought SPI	2.00
2015	Mild Drought SPI	1.00
2016	Mild Drought SPI	4.00
2017	Mild Drought SPI	0.00
2018	Mild Drought SPI	0.00
2019	Mild Drought SPI	2.00
2020	Mild Drought SPI	0.00
2021	Mild Drought SPI	0.00
2012	Moderate Drought SPI	1.00
2013	Moderate Drought SPI	0
2014	Moderate Drought SPI	1.00
2015	Moderate Drought SPI	1.00
2016	Moderate Drought SPI	1.00
2017	Moderate Drought SPI	0
2018	Moderate Drought SPI	0
2019	Moderate Drought SPI	1.00
2020	Moderate Drought SPI	0
2021	Moderate Drought SPI	0
2012	Severe Drought SPI	1.00
2013	Severe Drought SPI	0
2014	Severe Drought SPI	0
2015	Severe Drought SPI	0
2016	Severe Drought SPI	0
2017	Severe Drought SPI	0
2018	Severe Drought SPI	0
2019	Severe Drought SPI	1
2020	Severe Drought SPI	0
2021	Severe Drought SPI	0
2012	Extreme Drought SPI	0
2013	Extreme Drought SPI	0

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Year	Variable	Value
2014	Extreme Drought SPI	0
2015	Extreme Drought SPI	0
2016	Extreme Drought SPI	0
2017	Extreme Drought SPI	0
2018	Extreme Drought SPI	0
2019	Extreme Drought SPI	1.00
2020	Extreme Drought SPI	0
2021	Extreme Drought SPI	0
2012	Mild Drought Cumulative SPI	-1.65
2013	Mild Drought Cumulative SPI	-0.70
2014	Mild Drought Cumulative SPI	-2.13
2015	Mild Drought Cumulative SPI	-1.12
2016	Mild Drought Cumulative SPI	-2.95
2017	Mild Drought Cumulative SPI	0
2018	Mild Drought Cumulative SPI	0
2019	Mild Drought Cumulative SPI	-3.77
2020	Mild Drought Cumulative SPI	0
2021	Mild Drought Cumulative SPI	0
2012	Moderate Drought Cumulative SPI	-1.65
2013	Moderate Drought Cumulative SPI	0.00
2014	Moderate Drought Cumulative SPI	-1.39
2015	Moderate Drought Cumulative SPI	-1.12
2016	Moderate Drought Cumulative SPI	-1.15
2017	Moderate Drought Cumulative SPI	0.00
2018	Moderate Drought Cumulative SPI	0.00
2019	Moderate Drought Cumulative SPI	-3.03
2020	Moderate Drought Cumulative SPI	0.00
2021	Moderate Drought Cumulative SPI	0.00
2012	Severe Drought Cumulative SPI	-1.65
2013	Severe Drought Cumulative SPI	0
2014	Severe Drought Cumulative SPI	0
2015	Severe Drought Cumulative SPI	0
2016	Severe Drought Cumulative SPI	0
2017	Severe Drought Cumulative SPI	0
2018	Severe Drought Cumulative SPI	0
2019	Severe Drought Cumulative SPI	-3.03
2020	Severe Drought Cumulative SPI	0
2021	Severe Drought Cumulative SPI	0
2012	Extreme Drought Cumulative SPI	0
2013	Extreme Drought Cumulative SPI	0
2014	Extreme Drought Cumulative SPI	0
2015	Extreme Drought Cumulative SPI	0
2016	Extreme Drought Cumulative SPI	0
2017	Extreme Drought Cumulative SPI	0
2018	Extreme Drought Cumulative SPI	0
2019	Extreme Drought Cumulative SPI	-3.03
2020	Extreme Drought Cumulative SPI	0
2021	Extreme Drought Cumulative SPI	0
2012	Mild Drought SPEI	3.00
2013	Mild Drought SPEI	2.00
2014	Mild Drought SPEI	3.00
2015	Mild Drought SPEI	1.00
2016	Mild Drought SPEI	4.00

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Year	Variable	Value
2017	Mild Drought SPEI	2.00
2018	Mild Drought SPEI	2.00
2019	Mild Drought SPEI	2.00
2020	Mild Drought SPEI	0
2021	Mild Drought SPEI	0
2012	Moderate Drought SPEI	2.00
2013	Moderate Drought SPEI	0
2014	Moderate Drought SPEI	1.00
2015	Moderate Drought SPEI	1.00
2016	Moderate Drought SPEI	2.00
2017	Moderate Drought SPEI	0
2018	Moderate Drought SPEI	1.00
2019	Moderate Drought SPEI	1.00
2020	Moderate Drought SPEI	0
2021	Moderate Drought SPEI	0
2012	Severe Drought SPEI	1.00
2013	Severe Drought SPEI	0
2014	Severe Drought SPEI	0
2015	Severe Drought SPEI	1.00
2016	Severe Drought SPEI	0
2017	Severe Drought SPEI	0
2018	Severe Drought SPEI	0
2019	Severe Drought SPEI	1.00
2020	Severe Drought SPEI	0
2021	Severe Drought SPEI	0
2012	Extreme Drought SPEI	0
2013	Extreme Drought SPEI	0
2014	Extreme Drought SPEI	0
2015	Extreme Drought SPEI	0
2016	Extreme Drought SPEI	0
2017	Extreme Drought SPEI	0
2018	Extreme Drought SPEI	0
2019	Extreme Drought SPEI	0
2020	Extreme Drought SPEI	0
2021	Extreme Drought SPEI	0
2012	Mild Drought Cumulative SPEI	-3.13
2013	Mild Drought Cumulative SPEI	-1.41
2014	Mild Drought Cumulative SPEI	-2.73
2015	Mild Drought Cumulative SPEI	-1.54
2016	Mild Drought Cumulative SPEI	-4.01
2017	Mild Drought Cumulative SPEI	-1.41
2018	Mild Drought Cumulative SPEI	-1.82
2019	Mild Drought Cumulative SPEI	-2.74
2020	Mild Drought Cumulative SPEI	0
2021	Mild Drought Cumulative SPEI	0
2012	Moderate Drought Cumulative SPEI	-2.58
2013	Moderate Drought Cumulative SPEI	0
2014	Moderate Drought Cumulative SPEI	-1.05
2015	Moderate Drought Cumulative SPEI	-1.54
2016	Moderate Drought Cumulative SPEI	-2.67
2017	Moderate Drought Cumulative SPEI	0
2018	Moderate Drought Cumulative SPEI	-1.11
2019	Moderate Drought Cumulative SPEI	-1.82

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Year	Variable	Value
2020	Moderate Drought Cumulative SPEI	0
2021	Moderate Drought Cumulative SPEI	0
2012	Severe Drought Cumulative SPEI	-1.51
2013	Severe Drought Cumulative SPEI	0
2014	Severe Drought Cumulative SPEI	0
2015	Severe Drought Cumulative SPEI	-1.54
2016	Severe Drought Cumulative SPEI	0
2017	Severe Drought Cumulative SPEI	0
2018	Severe Drought Cumulative SPEI	0
2019	Severe Drought Cumulative SPEI	-1.82
2020	Severe Drought Cumulative SPEI	0
2021	Severe Drought Cumulative SPEI	0
2012	Extreme Drought Cumulative SPEI	0
2013	Extreme Drought Cumulative SPEI	0
2014	Extreme Drought Cumulative SPEI	0
2015	Extreme Drought Cumulative SPEI	0
2016	Extreme Drought Cumulative SPEI	0
2017	Extreme Drought Cumulative SPEI	0
2018	Extreme Drought Cumulative SPEI	0
2019	Extreme Drought Cumulative SPEI	0
2020	Extreme Drought Cumulative SPEI	0
2021	Extreme Drought Cumulative SPEI	0

Appendix C

Machine Learning

C.1 Group A

Table C.1: Machine learning results from the scenarios of group A.

Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
AM	6	2013	Soybeans	GroupA-0001	0.71	0.15	0.60	0.06	1216.49	18.73	1748	249	1499	RF
HB	6	2013	Soybeans	GroupA-0002	1.04	0.03	0.96	0.02	593.20	27.41	558	249	309	RF
NH	6	2013	Soybeans	GroupA-0003	2.29	0.12	2.14	0.00	2271.12	60.07	173	249	-76	RF
PTB	6	2013	Soybeans	GroupA-0004	0.50	0.00	0.41	0.01	1728.12	13.27	289	249	40	RF
BG	6	2013	Soybeans	GroupA-0005	0.81	0.04	0.66	0.04	3938.74	21.39	1438	249	1189	RF
BBEA	6	2013	Soybeans	GroupA-0006	1.57	0.03	1.48	0.11	4348.89	41.15	3081	249	2832	RF
AA	6	2013	Soybeans	GroupA-0007	3.00	0.00	2.96	0.01	30211.35	78.79	378	249	129	RF
SP	6	2013	Soybeans	GroupA-0008	2.94	0.02	2.90	0.05	32717.90	77.14	1994	249	1745	RF
BS	6	2013	Soybeans	GroupA-0009	0.80	0.15	0.67	0.02	3688.53	20.96	656	249	407	RF
AM	6	2014	Soybeans	GroupA-0010	0.82	0.06	0.71	0.06	1216.49	18.76	1748	250	1498	RF
HB	6	2014	Soybeans	GroupA-0011	1.57	0.02	1.43	0.01	593.20	35.99	555	250	305	RF
PB	6	2014	Soybeans	GroupA-0012	1.76	0.20	1.68	0.01	2775.62	40.30	334	250	84	RF
PTB	6	2014	Soybeans	GroupA-0013	1.37	0.06	1.28	0.01	1728.12	31.31	299	250	49	RF
PL	6	2014	Soybeans	GroupA-0014	0.79	0.01	0.70	0.03	632.74	18.11	974	250	724	RF
PLB	6	2014	Soybeans	GroupA-0015	0.75	0.14	0.67	0.01	1403.96	17.27	500	250	250	RF
BG	6	2014	Soybeans	GroupA-0016	2.86	0.01	2.79	0.05	3938.74	65.41	1438	250	1188	RF
BBEA	6	2014	Soybeans	GroupA-0017	2.60	0.00	2.52	0.12	4348.89	59.40	3084	250	2834	RF
SP	6	2014	Soybeans	GroupA-0018	2.66	0.00	2.59	0.05	32717.90	60.83	1993	250	1743	RF
BS	6	2014	Soybeans	GroupA-0019	2.20	0.02	2.10	0.02	3688.53	50.42	656	250	406	RF
AM	6	2015	Soybeans	GroupA-0020	0.88	0.02	0.78	0.05	1216.49	33.24	1467	251	1216	RF
CF	6	2015	Soybeans	GroupA-0021	0.87	0.01	0.72	0.03	1790.97	33.14	1097	251	846	RF
HB	6	2015	Soybeans	GroupA-0022	1.77	0.00	1.67	0.02	593.20	67.18	549	251	298	RF
PB	6	2015	Soybeans	GroupA-0023	0.95	0.04	0.83	0.01	2775.62	36.05	327	251	76	RF
PTB	6	2015	Soybeans	GroupA-0024	0.78	0.06	0.71	0.01	1728.12	29.71	303	251	52	RF
PL	6	2015	Soybeans	GroupA-0025	0.53	0.05	0.43	0.03	632.74	20.23	905	251	654	RF
PLB	6	2015	Soybeans	GroupA-0026	0.48	0.06	0.36	0.01	1403.96	18.13	499	251	248	RF
BG	6	2015	Soybeans	GroupA-0027	1.91	0.00	1.85	0.04	3938.74	72.46	1384	251	1133	RF
BBEA	6	2015	Soybeans	GroupA-0028	2.12	0.05	2.06	0.10	4348.89	80.43	2811	251	2560	RF
BS	6	2015	Soybeans	GroupA-0029	1.37	0.01	1.28	0.02	3688.53	52.06	659	251	408	RF
AM	6	2020	Soybeans	GroupA-0030	0.65	0.04	0.45	0.03	1216.49	17.56	991	247	744	RF
HB	6	2020	Soybeans	GroupA-0031	0.74	0.01	0.55	0.01	593.20	20.09	555	247	308	RF
NH	6	2020	Soybeans	GroupA-0032	1.92	0.00	1.72	0.01	2271.12	51.84	181	247	-66	RF
PTB	6	2020	Soybeans	GroupA-0033	2.13	0.00	2.05	0.01	1728.12	57.53	262	247	15	RF
BG	6	2020	Soybeans	GroupA-0034	0.55	0.04	0.44	0.05	3938.74	14.86	1436	247	1189	RF
BBEA	6	2020	Soybeans	GroupA-0035	0.63	0.00	0.53	0.12	4348.89	17.08	3036	247	2789	RF
BS	6	2020	Soybeans	GroupA-0036	0.80	0.03	0.58	0.02	3688.53	21.51	748	247	501	RF
AM	6	2021	Soybeans	GroupA-0037	0.85	0.01	0.69	0.06	1216.49	21.96	1730	246	1484	RF
CF	6	2021	Soybeans	GroupA-0038	0.89	0.01	0.67	0.04	1790.97	23.02	1090	246	844	RF
HB	6	2021	Soybeans	GroupA-0039	0.99	0.00	0.79	0.01	593.20	25.64	363	246	117	RF
NH	6	2021	Soybeans	GroupA-0040	1.48	0.04	1.22	0.00	2271.12	38.30	51	246	-195	RF
PB	6	2021	Soybeans	GroupA-0041	0.87	0.01	0.67	0.01	2775.62	22.63	246	246	0	RF
PE	6	2021	Soybeans	GroupA-0042	1.59	0.02	1.39	0.03	3050.40	41.32	938	246	692	RF
PW	6	2021	Soybeans	GroupA-0043	0.86	0.00	0.61	0.01	3135.13	22.27	246	246	0	RF
PTB	6	2021	Soybeans	GroupA-0044	1.95	0.01	1.80	0.01	1728.12	50.60	251	246	5	RF
PL	6	2021	Soybeans	GroupA-0045	1.01	0.00	0.77	0.03	632.74	26.20	978	246	732	RF
PLB	6	2021	Soybeans	GroupA-0046	1.13	0.02	0.87	0.02	1403.96	29.26	491	246	245	RF
JL	6	2021	Soybeans	GroupA-0047	1.21	0.00	0.95	0.02	31086.42	31.30	884	246	638	RF
BS	6	2021	Soybeans	GroupA-0048	2.83	0.02	2.71	0.00	3688.53	73.25	85	246	-161	RF
6	AM	2013	Soybeans	GroupA-0049	0.78	0.21	0.60	0.01	1216.49	24.06	249	1748	-1499	RF
HB	AM	2013	Soybeans	GroupA-0050	0.93	0.11	0.78	0.01	1351.32	28.83	558	1748	-1190	RF
NH	AM	2013	Soybeans	GroupA-0051	1.95	0.24	1.78	0.01	1283.59	60.39	173	1748	-1575	RF
PTB	AM	2013	Soybeans	GroupA-0052	0.91	0.01	0.70	0.01	1901.85	28.13	289	1748	-1459	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BG	AM	2013	Soybeans	GroupA-0053	0.93	0.01	0.72	0.04	4801.99	28.78	1438	1748	-310	RF
BBEA	AM	2013	Soybeans	GroupA-0054	1.09	0.01	0.93	0.09	5233.55	33.79	3081	1748	1333	RF
AA	AM	2013	Soybeans	GroupA-0055	2.46	0.01	2.33	0.01	29801.06	75.99	378	1748	-1370	RF
SP	AM	2013	Soybeans	GroupA-0056	2.48	0.02	2.36	0.05	32227.99	76.67	1994	1748	246	RF
BS	AM	2013	Soybeans	GroupA-0057	0.81	0.11	0.66	0.01	4011.02	25.19	656	1748	-1092	RF
6	AM	2014	Soybeans	GroupA-0058	0.82	0.01	0.65	0.01	1216.49	20.94	250	1748	-1498	RF
HB	AM	2014	Soybeans	GroupA-0059	1.67	0.02	1.51	0.01	1351.32	42.78	555	1748	-1193	RF
PB	AM	2014	Soybeans	GroupA-0060	1.57	0.03	1.39	0.01	3991.90	40.04	334	1748	-1414	RF
PTB	AM	2014	Soybeans	GroupA-0061	1.11	0.01	0.96	0.01	1901.85	28.28	299	1748	-1449	RF
PL	AM	2014	Soybeans	GroupA-0062	0.83	0.05	0.68	0.02	1797.09	21.32	974	1748	-774	RF
PLB	AM	2014	Soybeans	GroupA-0063	0.93	0.00	0.79	0.01	2601.80	23.76	500	1748	-1248	RF
BG	AM	2014	Soybeans	GroupA-0064	2.33	0.01	2.20	0.04	4801.99	59.55	1438	1748	-310	RF
BBEA	AM	2014	Soybeans	GroupA-0065	2.15	0.01	2.01	0.09	5233.55	54.95	3084	1748	1336	RF
SP	AM	2014	Soybeans	GroupA-0066	2.16	0.00	2.00	0.05	32227.99	55.10	1993	1748	245	RF
BS	AM	2014	Soybeans	GroupA-0067	2.12	0.13	2.00	0.02	4011.02	54.25	656	1748	-1092	RF
6	AM	2015	Soybeans	GroupA-0068	0.61	0.00	0.49	0.01	1216.49	29.69	251	1467	-1216	RF
CF	AM	2015	Soybeans	GroupA-0069	1.32	0.00	1.19	0.03	2925.31	63.97	1097	1467	-370	RF
HB	AM	2015	Soybeans	GroupA-0070	1.21	0.00	1.07	0.01	1351.32	58.85	549	1467	-918	RF
PB	AM	2015	Soybeans	GroupA-0071	0.71	0.00	0.59	0.01	3991.90	34.61	327	1467	-1140	RF
PTB	AM	2015	Soybeans	GroupA-0072	0.57	0.01	0.48	0.01	1901.85	27.71	303	1467	-1164	RF
PL	AM	2015	Soybeans	GroupA-0073	0.60	0.00	0.46	0.02	1797.09	28.93	905	1467	-562	RF
PLB	AM	2015	Soybeans	GroupA-0074	0.61	0.02	0.48	0.01	2601.80	29.67	499	1467	-968	RF
BG	AM	2015	Soybeans	GroupA-0075	1.38	0.00	1.27	0.04	4801.99	66.93	1384	1467	-83	RF
BBEA	AM	2015	Soybeans	GroupA-0076	1.48	0.00	1.38	0.09	5233.55	71.85	2811	1467	1344	RF
BS	AM	2015	Soybeans	GroupA-0077	1.02	0.07	0.92	0.02	4011.02	49.63	659	1467	-808	RF
CF	AM	2019	Soybeans	GroupA-0078	0.87	0.00	0.67	0.03	2925.31	31.73	1095	745	350	RF
HB	AM	2019	Soybeans	GroupA-0079	1.76	0.07	1.50	0.01	1351.32	63.82	174	745	-571	RF
PB	AM	2019	Soybeans	GroupA-0080	1.08	0.02	0.90	0.01	3991.90	39.24	278	745	-467	RF
PE	AM	2019	Soybeans	GroupA-0081	1.22	0.10	1.01	0.02	4256.93	44.23	942	745	197	RF
PW	AM	2019	Soybeans	GroupA-0082	1.12	0.02	0.89	0.01	4299.79	40.67	259	745	-486	RF
PTB	AM	2019	Soybeans	GroupA-0083	1.38	0.00	1.19	0.01	1901.85	50.12	270	745	-475	RF
PL	AM	2019	Soybeans	GroupA-0084	0.97	0.07	0.80	0.02	1797.09	35.11	968	745	223	RF
PLB	AM	2019	Soybeans	GroupA-0085	0.75	0.14	0.61	0.01	2601.80	27.18	502	745	-243	RF
JL	AM	2019	Soybeans	GroupA-0086	0.94	0.00	0.80	0.02	30699.89	34.18	888	745	143	RF
6	AM	2020	Soybeans	GroupA-0087	1.17	0.00	1.07	0.01	1216.49	27.49	247	991	-744	RF
HB	AM	2020	Soybeans	GroupA-0088	1.24	0.01	1.05	0.01	1351.32	29.02	555	991	-436	RF
NH	AM	2020	Soybeans	GroupA-0089	1.81	0.00	1.54	0.01	1283.59	42.27	181	991	-810	RF
PTB	AM	2020	Soybeans	GroupA-0090	2.60	0.00	2.53	0.01	1901.85	60.82	262	991	-729	RF
BG	AM	2020	Soybeans	GroupA-0091	0.85	0.00	0.71	0.04	4801.99	19.79	1436	991	445	RF
BBEA	AM	2020	Soybeans	GroupA-0092	0.90	0.03	0.80	0.09	5233.55	21.05	3036	991	2045	RF
BS	AM	2020	Soybeans	GroupA-0093	1.37	0.06	1.18	0.02	4011.02	32.02	748	991	-243	RF
6	AM	2021	Soybeans	GroupA-0094	1.03	0.03	0.76	0.01	1216.49	29.17	246	1730	-1484	RF
CF	AM	2021	Soybeans	GroupA-0095	1.17	0.05	0.83	0.03	2925.31	33.19	1090	1730	-640	RF
HB	AM	2021	Soybeans	GroupA-0096	1.18	0.00	1.00	0.01	1351.32	33.33	363	1730	-1367	RF
NH	AM	2021	Soybeans	GroupA-0097	1.30	0.02	1.08	0.00	1283.59	36.70	51	1730	-1679	RF
PB	AM	2021	Soybeans	GroupA-0098	1.01	0.08	0.73	0.01	3991.90	28.65	246	1730	-1484	RF
PE	AM	2021	Soybeans	GroupA-0099	1.94	0.13	1.71	0.02	4256.93	54.98	938	1730	-792	RF
PW	AM	2021	Soybeans	GroupA-0100	1.14	0.07	0.79	0.01	4299.79	32.17	246	1730	-1484	RF
PTB	AM	2021	Soybeans	GroupA-0101	1.73	0.00	1.56	0.01	1901.85	49.02	251	1730	-1479	RF
PL	AM	2021	Soybeans	GroupA-0102	1.04	0.04	0.76	0.03	1797.09	29.59	978	1730	-752	RF
PLB	AM	2021	Soybeans	GroupA-0103	1.38	0.06	1.06	0.01	2601.80	39.18	491	1730	-1239	RF
JL	AM	2021	Soybeans	GroupA-0104	1.55	0.00	1.21	0.02	30699.89	43.94	884	1730	-846	RF
BS	AM	2021	Soybeans	GroupA-0105	2.86	0.01	2.68	0.00	4011.02	80.98	85	1730	-1645	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PB	CF	2012	Soybeans	GroupA-0106	1.42	0.01	1.25	0.01	1477.63	37.17	335	1099	-764	RF
PL	CF	2012	Soybeans	GroupA-0107	0.78	0.02	0.61	0.02	1531.30	20.27	855	1099	-244	RF
PLB	CF	2012	Soybeans	GroupA-0108	0.74	0.08	0.58	0.01	1177.89	19.41	502	1099	-597	RF
CS	CF	2012	Soybeans	GroupA-0109	1.11	0.04	0.95	0.05	30336.27	29.01	1942	1099	843	RF
SP	CF	2012	Soybeans	GroupA-0110	1.58	0.02	1.45	0.05	32684.73	41.20	1929	1099	830	RF
6	CF	2015	Soybeans	GroupA-0111	0.98	0.02	0.88	0.01	1790.97	29.48	251	1097	-846	RF
AM	CF	2015	Soybeans	GroupA-0112	1.74	0.03	1.67	0.04	2925.31	52.06	1467	1097	370	RF
HB	CF	2015	Soybeans	GroupA-0113	2.53	0.00	2.44	0.02	1609.48	75.60	549	1097	-548	RF
PB	CF	2015	Soybeans	GroupA-0114	1.62	0.00	1.49	0.01	1477.63	48.60	327	1097	-770	RF
PTB	CF	2015	Soybeans	GroupA-0115	1.58	0.03	1.50	0.01	2125.67	47.21	303	1097	-794	RF
PL	CF	2015	Soybeans	GroupA-0116	0.73	0.00	0.63	0.02	1531.30	21.88	905	1097	-192	RF
PLB	CF	2015	Soybeans	GroupA-0117	1.26	0.00	1.13	0.01	1177.89	37.78	499	1097	-598	RF
BG	CF	2015	Soybeans	GroupA-0118	2.58	0.00	2.52	0.04	3976.07	77.16	1384	1097	287	RF
BBEA	CF	2015	Soybeans	GroupA-0119	2.50	0.00	2.45	0.10	4282.54	74.74	2811	1097	1714	RF
BS	CF	2015	Soybeans	GroupA-0120	2.29	0.00	2.24	0.02	3076.95	68.58	659	1097	-438	RF
HB	CF	2016	Soybeans	GroupA-0121	1.44	0.01	1.31	0.01	1609.48	40.82	181	1083	-902	RF
PB	CF	2016	Soybeans	GroupA-0122	1.48	0.02	1.37	0.01	1477.63	42.05	331	1083	-752	RF
PTB	CF	2016	Soybeans	GroupA-0123	1.06	0.04	0.95	0.01	2125.67	30.11	297	1083	-786	RF
BS	CF	2016	Soybeans	GroupA-0124	1.51	0.02	1.40	0.02	3076.95	42.79	655	1083	-428	RF
AM	CF	2019	Soybeans	GroupA-0125	1.20	0.02	1.00	0.02	2925.31	34.59	745	1095	-350	RF
HB	CF	2019	Soybeans	GroupA-0126	2.02	0.02	1.86	0.00	1609.48	58.34	174	1095	-921	RF
PB	CF	2019	Soybeans	GroupA-0127	1.25	0.04	1.11	0.01	1477.63	36.02	278	1095	-817	RF
PE	CF	2019	Soybeans	GroupA-0128	0.61	0.02	0.47	0.02	1470.34	17.71	942	1095	-153	RF
PW	CF	2019	Soybeans	GroupA-0129	0.62	0.01	0.48	0.01	1380.51	17.92	259	1095	-836	RF
PTB	CF	2019	Soybeans	GroupA-0130	2.22	0.00	2.12	0.01	2125.67	64.00	270	1095	-825	RF
PL	CF	2019	Soybeans	GroupA-0131	0.64	0.01	0.53	0.03	1531.30	18.53	968	1095	-127	RF
PLB	CF	2019	Soybeans	GroupA-0132	0.96	0.03	0.78	0.01	1177.89	27.61	502	1095	-593	RF
JL	CF	2019	Soybeans	GroupA-0133	1.24	0.01	1.13	0.02	30895.46	35.84	888	1095	-207	RF
6	CF	2021	Soybeans	GroupA-0134	2.40	0.02	2.27	0.01	1790.97	54.03	246	1090	-844	RF
AM	CF	2021	Soybeans	GroupA-0135	1.40	0.02	1.18	0.06	2925.31	31.48	1730	1090	640	RF
HB	CF	2021	Soybeans	GroupA-0136	1.16	0.00	0.91	0.01	1609.48	26.02	363	1090	-727	RF
NH	CF	2021	Soybeans	GroupA-0137	3.04	0.00	2.94	0.00	4061.52	68.45	51	1090	-1039	RF
PB	CF	2021	Soybeans	GroupA-0138	0.98	0.01	0.77	0.01	1477.63	22.09	246	1090	-844	RF
PE	CF	2021	Soybeans	GroupA-0139	1.07	0.01	0.85	0.02	1470.34	24.02	938	1090	-152	RF
PW	CF	2021	Soybeans	GroupA-0140	1.03	0.01	0.84	0.01	1380.51	23.16	246	1090	-844	RF
PTB	CF	2021	Soybeans	GroupA-0141	2.66	0.00	2.55	0.01	2125.67	59.98	251	1090	-839	RF
PL	CF	2021	Soybeans	GroupA-0142	0.99	0.00	0.79	0.03	1531.30	22.34	978	1090	-112	RF
PLB	CF	2021	Soybeans	GroupA-0143	1.21	0.01	0.95	0.01	1177.89	27.20	491	1090	-599	RF
JL	CF	2021	Soybeans	GroupA-0144	0.82	0.00	0.62	0.02	30895.46	18.36	884	1090	-206	RF
BS	CF	2021	Soybeans	GroupA-0145	3.77	0.00	3.69	0.00	3076.95	84.79	85	1090	-1005	RF
6	HB	2013	Soybeans	GroupA-0146	0.95	0.01	0.81	0.01	593.20	33.48	249	558	-309	RF
AM	HB	2013	Soybeans	GroupA-0147	0.72	0.01	0.58	0.05	1351.32	25.32	1748	558	1190	RF
NH	HB	2013	Soybeans	GroupA-0148	1.56	0.00	1.24	0.00	2580.18	55.15	173	558	-385	RF
PTB	HB	2013	Soybeans	GroupA-0149	1.12	0.00	0.94	0.01	1152.69	39.56	289	558	-269	RF
BG	HB	2013	Soybeans	GroupA-0150	0.94	0.01	0.75	0.04	4415.29	33.09	1438	558	880	RF
BBEA	HB	2013	Soybeans	GroupA-0151	0.71	0.00	0.60	0.11	4811.25	25.12	3081	558	2523	RF
AA	HB	2013	Soybeans	GroupA-0152	2.09	0.02	2.01	0.01	29656.73	73.70	378	558	-180	RF
SP	HB	2013	Soybeans	GroupA-0153	2.04	0.00	1.97	0.05	32179.07	72.23	1994	558	1436	RF
BS	HB	2013	Soybeans	GroupA-0154	0.74	0.00	0.58	0.02	3100.07	26.10	656	558	98	RF
6	HB	2014	Soybeans	GroupA-0155	1.52	0.03	1.24	0.01	593.20	49.65	250	555	-305	RF
AM	HB	2014	Soybeans	GroupA-0156	1.33	0.03	1.14	0.05	1351.32	43.48	1748	555	1193	RF
PB	HB	2014	Soybeans	GroupA-0157	1.21	0.00	1.01	0.01	2853.21	39.56	334	555	-221	RF
PTB	HB	2014	Soybeans	GroupA-0158	1.04	0.02	0.78	0.01	1152.69	33.87	299	555	-256	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PL	HB	2014	Soybeans	GroupA-0159	1.32	0.03	1.04	0.03	1056.49	43.03	974	555	419	RF
PLB	HB	2014	Soybeans	GroupA-0160	1.20	0.01	0.93	0.01	1650.52	39.31	500	555	-55	RF
BG	HB	2014	Soybeans	GroupA-0161	1.65	0.09	1.45	0.05	4415.29	53.94	1438	555	883	RF
BBEA	HB	2014	Soybeans	GroupA-0162	1.58	0.01	1.35	0.12	4811.25	51.74	3084	555	2529	RF
SP	HB	2014	Soybeans	GroupA-0163	1.59	0.00	1.36	0.05	32179.07	51.97	1993	555	1438	RF
BS	HB	2014	Soybeans	GroupA-0164	1.68	0.08	1.27	0.02	3100.07	54.94	656	555	101	RF
BG	HB	2015	Soybeans	GroupA-0172	0.73	0.11	0.59	0.04	4415.29	72.36	1384	549	835	RF
BBEA	HB	2015	Soybeans	GroupA-0173	0.80	0.14	0.61	0.10	4811.25	79.82	2811	549	2262	RF
BS	HB	2015	Soybeans	GroupA-0174	0.85	0.04	0.75	0.02	3100.07	84.35	659	549	110	RF
CF	HB	2016	Soybeans	GroupA-0175	1.07	0.08	0.85	0.03	1609.48	44.42	1083	181	902	RF
PB	HB	2016	Soybeans	GroupA-0176	0.62	0.19	0.51	0.01	2853.21	25.81	331	181	150	RF
PTB	HB	2016	Soybeans	GroupA-0177	0.81	0.00	0.62	0.01	1152.69	33.87	297	181	116	RF
BS	HB	2016	Soybeans	GroupA-0178	0.91	0.01	0.79	0.02	3100.07	38.03	655	181	474	RF
PB	HB	2018	Soybeans	GroupA-0179	1.40	0.02	1.24	0.01	2853.21	39.26	327	184	143	RF
PE	HB	2018	Soybeans	GroupA-0180	1.17	0.03	0.96	0.03	3020.77	32.74	941	184	757	RF
PW	HB	2018	Soybeans	GroupA-0181	1.47	0.00	1.28	0.01	2989.69	40.97	257	184	73	RF
PTB	HB	2018	Soybeans	GroupA-0182	1.07	0.02	0.88	0.01	1152.69	30.01	289	184	105	RF
BS	HB	2018	Soybeans	GroupA-0183	1.14	0.06	0.93	0.02	3100.07	31.85	752	184	568	RF
AM	HB	2019	Soybeans	GroupA-0184	1.08	0.04	0.81	0.02	1351.32	57.33	745	174	571	RF
CF	HB	2019	Soybeans	GroupA-0185	1.51	0.30	1.21	0.03	1609.48	80.25	1095	174	921	RF
PB	HB	2019	Soybeans	GroupA-0186	1.08	0.01	0.90	0.01	2853.21	57.36	278	174	104	RF
PTB	HB	2019	Soybeans	GroupA-0189	0.99	0.00	0.85	0.01	1152.69	52.59	270	174	96	RF
PL	HB	2019	Soybeans	GroupA-0190	1.45	0.24	1.24	0.03	1056.49	77.06	968	174	794	RF
PLB	HB	2019	Soybeans	GroupA-0191	0.96	0.11	0.74	0.02	1650.52	50.89	502	174	328	RF
JL	HB	2019	Soybeans	GroupA-0192	1.02	0.31	0.82	0.02	30527.42	54.16	888	174	714	RF
6	HB	2020	Soybeans	GroupA-0193	0.92	0.08	0.75	0.01	593.20	28.53	247	555	-308	RF
AM	HB	2020	Soybeans	GroupA-0194	1.20	0.01	0.88	0.03	1351.32	37.41	991	555	436	RF
NH	HB	2020	Soybeans	GroupA-0195	1.83	0.32	1.57	0.00	2580.18	56.82	181	555	-374	RF
PTB	HB	2020	Soybeans	GroupA-0196	1.84	0.21	1.59	0.01	1152.69	57.15	262	555	-293	RF
BG	HB	2020	Soybeans	GroupA-0197	1.20	0.04	0.86	0.05	4415.29	37.20	1436	555	881	RF
BBEA	HB	2020	Soybeans	GroupA-0198	1.13	0.16	0.89	0.11	4811.25	35.03	3036	555	2481	RF
BS	HB	2020	Soybeans	GroupA-0199	0.76	0.40	0.60	0.02	3100.07	23.67	748	555	193	RF
6	HB	2021	Soybeans	GroupA-0200	0.76	0.01	0.62	0.01	593.20	20.98	246	363	-117	RF
AM	HB	2021	Soybeans	GroupA-0201	0.63	0.04	0.47	0.06	1351.32	17.37	1730	363	1367	RF
CF	HB	2021	Soybeans	GroupA-0202	0.84	0.06	0.69	0.03	1609.48	23.07	1090	363	727	RF
NH	HB	2021	Soybeans	GroupA-0203	1.19	0.03	0.90	0.00	2580.18	32.73	51	363	-312	RF
PB	HB	2021	Soybeans	GroupA-0204	0.73	0.01	0.57	0.01	2853.21	20.23	246	363	-117	RF
PE	HB	2021	Soybeans	GroupA-0205	1.76	0.05	1.65	0.03	3020.77	48.47	938	363	575	RF
PW	HB	2021	Soybeans	GroupA-0206	0.74	0.00	0.59	0.01	2989.69	20.48	246	363	-117	RF
PTB	HB	2021	Soybeans	GroupA-0207	1.67	0.02	1.51	0.01	1152.69	46.00	251	363	-112	RF
PL	HB	2021	Soybeans	GroupA-0208	0.77	0.09	0.61	0.03	1056.49	21.35	978	363	615	RF
PLB	HB	2021	Soybeans	GroupA-0209	1.20	0.16	1.03	0.01	1650.52	33.18	491	363	128	RF
JL	HB	2021	Soybeans	GroupA-0210	1.34	0.03	1.18	0.02	30527.42	37.03	884	363	521	RF
BS	HB	2021	Soybeans	GroupA-0211	2.66	0.02	2.57	0.00	3100.07	73.39	85	363	-278	RF
6	NH	2013	Soybeans	GroupA-0212	1.69	0.00	1.23	0.01	2271.12	67.62	249	173	76	RF
AM	NH	2013	Soybeans	GroupA-0213	1.35	0.21	0.94	0.06	1283.59	54.10	1748	173	1575	RF
HB	NH	2013	Soybeans	GroupA-0214	1.24	0.06	0.92	0.02	2580.18	49.64	558	173	385	RF
PTB	NH	2013	Soybeans	GroupA-0215	1.56	0.06	1.06	0.01	3164.44	62.36	289	173	116	RF
BG	NH	2013	Soybeans	GroupA-0216	2.02	0.11	1.66	0.04	4995.12	80.80	1438	173	1265	RF
BBEA	NH	2013	Soybeans	GroupA-0217	1.29	0.02	0.94	0.10	5431.98	51.75	3081	173	2908	RF
AA	NH	2013	Soybeans	GroupA-0218	1.88	0.02	1.69	0.01	30478.82	75.22	378	173	205	RF
SP	NH	2013	Soybeans	GroupA-0219	1.97	0.00	1.76	0.06	32824.38	78.90	1994	173	1821	RF
BS	NH	2013	Soybeans	GroupA-0220	1.22	0.01	1.05	0.02	5253.94	48.90	656	173	483	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
6	NH	2020	Soybeans	GroupA-0221	1.15	0.04	0.93	0.01	2271.12	35.28	247	181	66	RF
AM	NH	2020	Soybeans	GroupA-0222	1.43	0.16	1.03	0.03	1283.59	44.03	991	181	810	RF
HB	NH	2020	Soybeans	GroupA-0223	1.19	0.03	0.98	0.01	2580.18	36.73	555	181	374	RF
PTB	NH	2020	Soybeans	GroupA-0224	1.64	0.00	1.50	0.01	3164.44	50.58	262	181	81	RF
BG	NH	2020	Soybeans	GroupA-0225	1.39	0.03	0.93	0.04	4995.12	42.76	1436	181	1255	RF
BBEA	NH	2020	Soybeans	GroupA-0226	1.23	0.03	0.84	0.10	5431.98	37.70	3036	181	2855	RF
BS	NH	2020	Soybeans	GroupA-0227	1.15	0.05	0.92	0.02	5253.94	35.45	748	181	567	RF
6	NH	2021	Soybeans	GroupA-0228	1.76	0.09	1.54	0.01	2271.12	69.27	246	51	195	RF
AM	NH	2021	Soybeans	GroupA-0229	0.62	0.59	0.51	0.06	1283.59	24.51	1730	51	1679	RF
CF	NH	2021	Soybeans	GroupA-0230	1.95	0.19	1.78	0.03	4061.52	77.05	1090	51	1039	RF
HB	NH	2021	Soybeans	GroupA-0231	1.64	0.01	1.38	0.01	2580.18	64.62	363	51	312	RF
PB	NH	2021	Soybeans	GroupA-0232	1.72	0.22	1.52	0.01	4911.94	67.93	246	51	195	RF
PW	NH	2021	Soybeans	GroupA-0234	1.64	0.30	1.32	0.01	5399.77	64.83	246	51	195	RF
PTB	NH	2021	Soybeans	GroupA-0235	0.91	0.07	0.83	0.01	3164.44	35.72	251	51	200	RF
PL	NH	2021	Soybeans	GroupA-0236	1.30	0.22	0.88	0.03	2690.61	51.10	978	51	927	RF
PLB	NH	2021	Soybeans	GroupA-0237	1.81	0.05	1.60	0.01	3474.91	71.43	491	51	440	RF
JL	NH	2021	Soybeans	GroupA-0238	2.18	0.15	1.94	0.02	31398.77	86.07	884	51	833	RF
BS	NH	2021	Soybeans	GroupA-0239	2.12	0.36	1.95	0.00	5253.94	83.54	85	51	34	RF
CF	PB	2012	Soybeans	GroupA-0240	1.13	0.00	0.87	0.03	1477.63	35.29	1099	335	764	RF
PL	PB	2012	Soybeans	GroupA-0241	1.11	0.04	0.82	0.02	2233.71	34.89	855	335	520	RF
PLB	PB	2012	Soybeans	GroupA-0242	1.11	0.00	0.86	0.01	1437.03	34.88	502	335	167	RF
CS	PB	2012	Soybeans	GroupA-0243	1.26	0.25	0.88	0.05	31668.37	39.59	1942	335	1607	RF
SP	PB	2012	Soybeans	GroupA-0244	1.61	0.03	1.44	0.05	34025.37	50.30	1929	335	1594	RF
6	PB	2014	Soybeans	GroupA-0245	1.28	0.03	0.90	0.01	2775.62	36.60	250	334	-84	RF
AM	PB	2014	Soybeans	GroupA-0246	1.03	0.03	0.83	0.04	3991.90	29.51	1748	334	1414	RF
HB	PB	2014	Soybeans	GroupA-0247	1.21	0.00	1.05	0.01	2853.21	34.74	555	334	221	RF
PTB	PB	2014	Soybeans	GroupA-0248	1.40	0.00	1.26	0.01	3582.30	40.07	299	334	-35	RF
PL	PB	2014	Soybeans	GroupA-0249	1.16	0.07	0.84	0.02	2233.71	33.17	974	334	640	RF
PLB	PB	2014	Soybeans	GroupA-0250	1.02	0.04	0.84	0.01	1437.03	29.33	500	334	166	RF
BG	PB	2014	Soybeans	GroupA-0251	2.33	0.02	2.10	0.03	3001.92	66.67	1438	334	1104	RF
BBEA	PB	2014	Soybeans	GroupA-0252	2.11	0.02	1.89	0.09	3203.03	60.49	3084	334	2750	RF
SP	PB	2014	Soybeans	GroupA-0253	1.78	0.07	1.61	0.05	34025.37	51.13	1993	334	1659	RF
BS	PB	2014	Soybeans	GroupA-0254	2.02	0.01	1.84	0.02	4411.96	57.85	656	334	322	RF
6	PB	2015	Soybeans	GroupA-0255	0.82	0.00	0.62	0.01	2775.62	40.34	251	327	-76	RF
AM	PB	2015	Soybeans	GroupA-0256	0.85	0.01	0.74	0.04	3991.90	42.20	1467	327	1140	RF
CF	PB	2015	Soybeans	GroupA-0257	1.21	0.00	0.99	0.03	1477.63	59.68	1097	327	770	RF
HB	PB	2015	Soybeans	GroupA-0258	1.08	0.05	0.93	0.01	2853.21	53.67	549	327	222	RF
PTB	PB	2015	Soybeans	GroupA-0259	0.94	0.04	0.81	0.01	3582.30	46.48	303	327	-24	RF
PL	PB	2015	Soybeans	GroupA-0260	1.29	0.00	1.09	0.02	2233.71	64.03	905	327	578	RF
PLB	PB	2015	Soybeans	GroupA-0261	0.72	0.12	0.54	0.01	1437.03	35.59	499	327	172	RF
BG	PB	2015	Soybeans	GroupA-0262	1.49	0.01	1.35	0.04	3001.92	73.72	1384	327	1057	RF
BBEA	PB	2015	Soybeans	GroupA-0263	1.41	0.05	1.27	0.10	3203.03	69.65	2811	327	2484	RF
BS	PB	2015	Soybeans	GroupA-0264	1.05	0.00	0.92	0.02	4411.96	51.77	659	327	332	RF
CF	PB	2016	Soybeans	GroupA-0265	1.07	0.00	0.82	0.03	1477.63	41.15	1083	331	752	RF
HB	PB	2016	Soybeans	GroupA-0266	0.80	0.03	0.61	0.00	2853.21	30.64	181	331	-150	RF
PTB	PB	2016	Soybeans	GroupA-0267	0.87	0.00	0.66	0.01	3582.30	33.47	297	331	-34	RF
BS	PB	2016	Soybeans	GroupA-0268	1.17	0.03	1.04	0.02	4411.96	44.82	655	331	324	RF
HB	PB	2018	Soybeans	GroupA-0269	1.51	0.01	1.12	0.01	2853.21	52.59	184	327	-143	RF
PE	PB	2018	Soybeans	GroupA-0270	1.82	0.02	1.43	0.02	573.60	63.37	941	327	614	RF
PW	PB	2018	Soybeans	GroupA-0271	2.26	0.00	1.89	0.01	1133.42	78.54	257	327	-70	RF
PTB	PB	2018	Soybeans	GroupA-0272	1.54	0.00	1.19	0.01	3582.30	53.63	289	327	-38	RF
BS	PB	2018	Soybeans	GroupA-0273	1.35	0.00	1.18	0.02	4411.96	47.02	752	327	425	RF
AM	PB	2019	Soybeans	GroupA-0274	1.14	0.01	0.87	0.02	3991.90	56.30	745	278	467	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CF	PB	2019	Soybeans	GroupA-0275	1.47	0.17	1.20	0.03	1477.63	72.63	1095	278	817	RF
HB	PB	2019	Soybeans	GroupA-0276	0.92	0.10	0.75	0.01	2853.21	45.36	174	278	-104	RF
PE	PB	2019	Soybeans	GroupA-0277	1.19	0.30	0.91	0.02	573.60	58.87	942	278	664	RF
PW	PB	2019	Soybeans	GroupA-0278	1.82	0.25	1.57	0.01	1133.42	89.51	259	278	-19	RF
PTB	PB	2019	Soybeans	GroupA-0279	1.16	0.12	1.02	0.01	3582.30	57.10	270	278	-8	RF
PL	PB	2019	Soybeans	GroupA-0280	2.01	0.03	1.77	0.02	2233.71	98.86	968	278	690	RF
PLB	PB	2019	Soybeans	GroupA-0281	1.65	0.01	1.34	0.01	1437.03	81.16	502	278	224	RF
JL	PB	2019	Soybeans	GroupA-0282	1.00	0.05	0.78	0.02	32178.80	49.22	888	278	610	RF
6	PB	2021	Soybeans	GroupA-0283	1.77	0.02	1.51	0.01	2775.62	62.99	246	246	0	RF
AM	PB	2021	Soybeans	GroupA-0284	1.67	0.23	1.37	0.06	3991.90	59.56	1730	246	1484	RF
CF	PB	2021	Soybeans	GroupA-0285	2.13	0.35	1.70	0.03	1477.63	76.08	1090	246	844	RF
HB	PB	2021	Soybeans	GroupA-0286	1.73	0.04	1.51	0.01	2853.21	61.79	363	246	117	RF
NH	PB	2021	Soybeans	GroupA-0287	2.22	0.10	1.81	0.00	4911.94	79.09	51	246	-195	RF
PE	PB	2021	Soybeans	GroupA-0288	1.61	0.50	1.25	0.02	573.60	57.33	938	246	692	RF
PTB	PB	2021	Soybeans	GroupA-0290	2.06	0.23	1.68	0.01	3582.30	73.29	251	246	5	RF
PL	PB	2021	Soybeans	GroupA-0291	2.24	0.27	1.84	0.03	2233.71	79.97	978	246	732	RF
PLB	PB	2021	Soybeans	GroupA-0292	1.75	0.00	1.50	0.01	1437.03	62.24	491	246	245	RF
JL	PB	2021	Soybeans	GroupA-0293	2.78	0.11	2.29	0.02	32178.80	99.01	884	246	638	RF
BS	PB	2021	Soybeans	GroupA-0294	2.66	0.18	2.19	0.00	4411.96	94.90	85	246	-161	RF
HB	PE	2018	Soybeans	GroupA-0295	1.29	0.01	1.15	0.00	3020.77	27.73	184	941	-757	RF
PB	PE	2018	Soybeans	GroupA-0296	2.10	0.02	1.92	0.01	573.60	45.06	327	941	-614	RF
PW	PE	2018	Soybeans	GroupA-0297	0.64	0.01	0.51	0.01	602.45	13.79	257	941	-684	RF
PTB	PE	2018	Soybeans	GroupA-0298	1.17	0.00	1.01	0.01	3583.16	25.07	289	941	-652	RF
BS	PE	2018	Soybeans	GroupA-0299	1.63	0.05	1.51	0.02	4129.23	34.98	752	941	-189	RF
AM	PE	2019	Soybeans	GroupA-0300	1.07	0.28	0.97	0.02	4256.93	30.69	745	942	-197	RF
CF	PE	2019	Soybeans	GroupA-0301	0.61	0.16	0.50	0.03	1470.34	17.49	1095	942	153	RF
HB	PE	2019	Soybeans	GroupA-0302	1.89	0.09	1.67	0.00	3020.77	53.85	174	942	-768	RF
PB	PE	2019	Soybeans	GroupA-0303	1.51	0.14	1.34	0.01	573.60	43.27	278	942	-664	RF
PW	PE	2019	Soybeans	GroupA-0304	0.69	0.01	0.55	0.01	602.45	19.72	259	942	-683	RF
PTB	PE	2019	Soybeans	GroupA-0305	2.26	0.00	2.14	0.01	3583.16	64.46	270	942	-672	RF
PL	PE	2019	Soybeans	GroupA-0306	0.82	0.14	0.68	0.02	2576.96	23.42	968	942	26	RF
PLB	PE	2019	Soybeans	GroupA-0307	1.03	0.08	0.90	0.01	1832.05	29.33	502	942	-440	RF
JL	PE	2019	Soybeans	GroupA-0308	1.30	0.01	1.16	0.02	31805.51	37.21	888	942	-54	RF
6	PE	2021	Soybeans	GroupA-0309	2.74	0.00	2.57	0.01	3050.40	58.25	246	938	-692	RF
AM	PE	2021	Soybeans	GroupA-0310	1.76	0.25	1.62	0.05	4256.93	37.40	1730	938	792	RF
CF	PE	2021	Soybeans	GroupA-0311	1.12	0.08	0.89	0.03	1470.34	23.84	1090	938	152	RF
HB	PE	2021	Soybeans	GroupA-0312	1.51	0.28	1.36	0.01	3020.77	32.11	363	938	-575	RF
NH	PE	2021	Soybeans	GroupA-0313	3.44	0.28	3.28	0.00	5265.97	72.98	51	938	-887	RF
PB	PE	2021	Soybeans	GroupA-0314	1.45	0.40	1.26	0.01	573.60	30.83	246	938	-692	RF
PW	PE	2021	Soybeans	GroupA-0315	1.39	0.00	0.95	0.01	602.45	29.44	246	938	-692	RF
PTB	PE	2021	Soybeans	GroupA-0316	3.23	0.11	3.05	0.01	3583.16	68.47	251	938	-687	RF
PL	PE	2021	Soybeans	GroupA-0317	1.44	0.01	1.27	0.02	2576.96	30.60	978	938	40	RF
PLB	PE	2021	Soybeans	GroupA-0318	2.03	0.00	1.86	0.01	1832.05	43.15	491	938	-447	RF
JL	PE	2021	Soybeans	GroupA-0319	1.52	0.41	1.10	0.02	31805.51	32.19	884	938	-54	RF
BS	PE	2021	Soybeans	GroupA-0320	4.11	0.09	3.96	0.00	4129.23	87.26	85	938	-853	RF
HB	PW	2018	Soybeans	GroupA-0321	1.26	0.00	1.12	0.01	2989.69	27.50	184	257	-73	RF
PB	PW	2018	Soybeans	GroupA-0322	2.33	0.22	2.26	0.01	1133.42	50.93	327	257	70	RF
PE	PW	2018	Soybeans	GroupA-0323	0.66	0.09	0.51	0.02	602.45	14.48	941	257	684	RF
PTB	PW	2018	Soybeans	GroupA-0324	0.94	0.12	0.80	0.01	3360.13	20.64	289	257	32	RF
BS	PW	2018	Soybeans	GroupA-0325	1.03	0.06	0.90	0.02	3638.27	22.54	752	257	495	RF
AM	PW	2019	Soybeans	GroupA-0326	1.01	0.06	0.92	0.02	4299.79	28.06	745	259	486	RF
CF	PW	2019	Soybeans	GroupA-0327	0.67	0.01	0.54	0.03	1380.51	18.48	1095	259	836	RF
HB	PW	2019	Soybeans	GroupA-0328	2.42	0.03	2.31	0.00	2989.69	67.01	174	259	-85	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PB	PW	2019	Soybeans	GroupA-0329	1.17	0.00	1.07	0.01	1133.42	32.48	278	259	19	RF
PE	PW	2019	Soybeans	GroupA-0330	0.57	0.00	0.44	0.03	602.45	15.82	942	259	683	RF
PTB	PW	2019	Soybeans	GroupA-0331	2.39	0.00	2.33	0.01	3360.13	66.21	270	259	11	RF
PL	PW	2019	Soybeans	GroupA-0332	0.73	0.06	0.60	0.03	2757.07	20.20	968	259	709	RF
PLB	PW	2019	Soybeans	GroupA-0333	0.90	0.06	0.76	0.02	2110.84	24.80	502	259	243	RF
JL	PW	2019	Soybeans	GroupA-0334	1.35	0.00	1.25	0.02	31235.93	37.32	888	259	629	RF
6	PW	2021	Soybeans	GroupA-0335	2.40	0.06	2.22	0.01	3135.13	54.72	246	246	0	RF
AM	PW	2021	Soybeans	GroupA-0336	1.05	0.00	0.82	0.06	4299.79	23.95	1730	246	1484	RF
CF	PW	2021	Soybeans	GroupA-0337	0.76	0.00	0.62	0.03	1380.51	17.34	1090	246	844	RF
HB	PW	2021	Soybeans	GroupA-0338	0.71	0.02	0.56	0.01	2989.69	16.13	363	246	117	RF
NH	PW	2021	Soybeans	GroupA-0339	2.87	0.02	2.77	0.00	5399.77	65.28	51	246	-195	RF
PB	PW	2021	Soybeans	GroupA-0340	0.80	0.00	0.66	0.01	1133.42	18.23	246	246	0	RF
PE	PW	2021	Soybeans	GroupA-0341	1.23	0.00	1.07	0.03	602.45	27.90	938	246	692	RF
PTB	PW	2021	Soybeans	GroupA-0342	2.61	0.00	2.51	0.01	3360.13	59.49	251	246	5	RF
PL	PW	2021	Soybeans	GroupA-0343	0.74	0.01	0.60	0.03	2757.07	16.83	978	246	732	RF
PLB	PW	2021	Soybeans	GroupA-0344	0.75	0.03	0.61	0.01	2110.84	17.05	491	246	245	RF
JL	PW	2021	Soybeans	GroupA-0345	0.81	0.02	0.67	0.02	31235.93	18.43	884	246	638	RF
BS	PW	2021	Soybeans	GroupA-0346	3.56	0.00	3.49	0.00	3638.27	81.04	85	246	-161	RF
6	PTB	2013	Soybeans	GroupA-0347	0.69	0.01	0.59	0.01	1728.12	19.03	249	289	-40	RF
AM	PTB	2013	Soybeans	GroupA-0348	1.32	0.00	1.17	0.06	1901.85	36.20	1748	289	1459	RF
HB	PTB	2013	Soybeans	GroupA-0349	1.09	0.01	1.02	0.01	1152.69	29.91	558	289	269	RF
NH	PTB	2013	Soybeans	GroupA-0350	2.44	0.05	2.27	0.00	3164.44	67.06	173	289	-116	RF
BG	PTB	2013	Soybeans	GroupA-0351	0.68	0.11	0.54	0.04	5528.32	18.64	1438	289	1149	RF
BBEA	PTB	2013	Soybeans	GroupA-0352	0.99	0.04	0.91	0.11	5911.78	27.23	3081	289	2792	RF
AA	PTB	2013	Soybeans	GroupA-0353	2.94	0.10	2.86	0.01	28506.53	80.61	378	289	89	RF
SP	PTB	2013	Soybeans	GroupA-0354	2.78	0.03	2.71	0.05	31037.05	76.39	1994	289	1705	RF
BS	PTB	2013	Soybeans	GroupA-0355	1.50	0.02	1.33	0.02	2114.72	41.24	656	289	367	RF
6	PTB	2014	Soybeans	GroupA-0356	1.17	0.11	0.96	0.01	1728.12	34.93	250	299	-49	RF
AM	PTB	2014	Soybeans	GroupA-0357	0.97	0.08	0.83	0.05	1901.85	28.95	1748	299	1449	RF
HB	PTB	2014	Soybeans	GroupA-0358	0.93	0.01	0.76	0.01	1152.69	27.81	555	299	256	RF
PB	PTB	2014	Soybeans	GroupA-0359	1.06	0.01	0.92	0.01	3582.30	31.51	334	299	35	RF
PL	PTB	2014	Soybeans	GroupA-0360	0.95	0.00	0.70	0.03	2192.01	28.31	974	299	675	RF
PLB	PTB	2014	Soybeans	GroupA-0361	1.13	0.05	0.89	0.01	2652.61	33.76	500	299	201	RF
BG	PTB	2014	Soybeans	GroupA-0362	1.63	0.08	1.48	0.05	5528.32	48.62	1438	299	1139	RF
BBEA	PTB	2014	Soybeans	GroupA-0363	1.56	0.00	1.40	0.12	5911.78	46.48	3084	299	2785	RF
SP	PTB	2014	Soybeans	GroupA-0364	1.63	0.06	1.46	0.05	31037.05	48.67	1993	299	1694	RF
BS	PTB	2014	Soybeans	GroupA-0365	1.94	0.01	1.75	0.01	2114.72	57.78	656	299	357	RF
6	PTB	2015	Soybeans	GroupA-0366	0.88	0.03	0.71	0.01	1728.12	50.19	251	303	-52	RF
AM	PTB	2015	Soybeans	GroupA-0367	0.69	0.01	0.58	0.04	1901.85	39.38	1467	303	1164	RF
CF	PTB	2015	Soybeans	GroupA-0368	1.37	0.09	1.25	0.03	2125.67	77.97	1097	303	794	RF
HB	PTB	2015	Soybeans	GroupA-0369	0.81	0.01	0.66	0.01	1152.69	46.17	549	303	246	RF
PB	PTB	2015	Soybeans	GroupA-0370	0.64	0.00	0.54	0.01	3582.30	36.65	327	303	24	RF
PL	PTB	2015	Soybeans	GroupA-0371	1.40	0.01	1.26	0.03	2192.01	79.70	905	303	602	RF
PLB	PTB	2015	Soybeans	GroupA-0372	0.94	0.01	0.78	0.01	2652.61	53.52	499	303	196	RF
BG	PTB	2015	Soybeans	GroupA-0373	1.06	0.07	0.93	0.04	5528.32	60.54	1384	303	1081	RF
BBEA	PTB	2015	Soybeans	GroupA-0374	1.02	0.00	0.86	0.10	5911.78	58.23	2811	303	2508	RF
BS	PTB	2015	Soybeans	GroupA-0375	0.92	0.00	0.78	0.01	2114.72	52.56	659	303	356	RF
CF	PTB	2016	Soybeans	GroupA-0376	0.60	0.00	0.46	0.03	2125.67	20.56	1083	297	786	RF
HB	PTB	2016	Soybeans	GroupA-0377	0.62	0.06	0.52	0.01	1152.69	21.27	181	297	-116	RF
PB	PTB	2016	Soybeans	GroupA-0378	0.88	0.07	0.80	0.01	3582.30	30.49	331	297	34	RF
BS	PTB	2016	Soybeans	GroupA-0379	1.23	0.11	1.09	0.01	2114.72	42.36	655	297	358	RF
HB	PTB	2018	Soybeans	GroupA-0380	0.73	0.01	0.59	0.00	1152.69	18.27	184	289	-105	RF
PB	PTB	2018	Soybeans	GroupA-0381	1.61	0.04	1.45	0.01	3582.30	40.27	327	289	38	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PE	PTB	2018	Soybeans	GroupA-0382	0.85	0.04	0.64	0.03	3583.16	21.23	941	289	652	RF
PW	PTB	2018	Soybeans	GroupA-0383	1.12	0.00	0.94	0.01	3360.13	28.01	257	289	-32	RF
BS	PTB	2018	Soybeans	GroupA-0384	1.29	0.00	1.13	0.02	2114.72	32.30	752	289	463	RF
HB	PTB	2019	Soybeans	GroupA-0387	1.37	0.03	1.08	0.01	1152.69	96.95	174	270	-96	RF
PB	PTB	2019	Soybeans	GroupA-0388	1.08	0.04	0.90	0.01	3582.30	76.21	278	270	8	RF
JL	PTB	2019	Soybeans	GroupA-0393	1.19	0.04	0.94	0.02	29375.83	84.40	888	270	618	RF
6	PTB	2020	Soybeans	GroupA-0394	1.47	0.06	1.33	0.01	1728.12	79.39	247	262	-15	RF
HB	PTB	2020	Soybeans	GroupA-0396	1.40	0.01	1.15	0.01	1152.69	75.77	555	262	293	RF
NH	PTB	2020	Soybeans	GroupA-0397	1.15	0.03	0.96	0.00	3164.44	62.15	181	262	-81	RF
BS	PTB	2020	Soybeans	GroupA-0400	0.99	0.10	0.83	0.02	2114.72	53.63	748	262	486	RF
6	PTB	2021	Soybeans	GroupA-0401	1.25	0.00	1.01	0.01	1728.12	64.53	246	251	-5	RF
AM	PTB	2021	Soybeans	GroupA-0402	1.49	0.06	1.29	0.06	1901.85	76.95	1730	251	1479	RF
HB	PTB	2021	Soybeans	GroupA-0404	1.62	0.10	1.43	0.01	1152.69	84.00	363	251	112	RF
NH	PTB	2021	Soybeans	GroupA-0405	1.09	0.00	0.90	0.00	3164.44	56.27	51	251	-200	RF
PB	PTB	2021	Soybeans	GroupA-0406	1.60	0.01	1.38	0.01	3582.30	82.53	246	251	-5	RF
BS	PTB	2021	Soybeans	GroupA-0412	1.49	0.00	1.29	0.00	2114.72	77.12	85	251	-166	RF
CF	PL	2012	Soybeans	GroupA-0413	0.71	0.03	0.55	0.03	1531.30	19.73	1099	855	244	RF
PB	PL	2012	Soybeans	GroupA-0414	1.23	0.01	1.10	0.01	2233.71	34.12	335	855	-520	RF
PLB	PL	2012	Soybeans	GroupA-0415	0.71	0.03	0.56	0.02	809.82	19.61	502	855	-353	RF
CS	PL	2012	Soybeans	GroupA-0416	0.76	0.01	0.60	0.05	30903.15	21.03	1942	855	1087	RF
SP	PL	2012	Soybeans	GroupA-0417	1.52	0.05	1.31	0.05	33228.68	42.10	1929	855	1074	RF
6	PL	2014	Soybeans	GroupA-0418	0.81	0.00	0.61	0.01	632.74	20.55	250	974	-724	RF
AM	PL	2014	Soybeans	GroupA-0419	0.81	0.03	0.63	0.05	1797.09	20.41	1748	974	774	RF
HB	PL	2014	Soybeans	GroupA-0420	1.54	0.00	1.37	0.01	1056.49	38.84	555	974	-419	RF
PB	PL	2014	Soybeans	GroupA-0421	1.40	0.04	1.24	0.01	2233.71	35.30	334	974	-640	RF
PTB	PL	2014	Soybeans	GroupA-0422	1.19	0.00	1.04	0.01	2192.01	30.13	299	974	-675	RF
PLB	PL	2014	Soybeans	GroupA-0423	0.74	0.04	0.59	0.01	809.82	18.67	500	974	-474	RF
BG	PL	2014	Soybeans	GroupA-0424	2.35	0.02	2.25	0.05	3360.23	59.40	1438	974	464	RF
BBEA	PL	2014	Soybeans	GroupA-0425	2.18	0.03	2.05	0.12	3759.77	54.94	3084	974	2110	RF
SP	PL	2014	Soybeans	GroupA-0426	2.23	0.02	2.12	0.06	33228.68	56.25	1993	974	1019	RF
BS	PL	2014	Soybeans	GroupA-0427	2.20	0.01	2.07	0.01	3972.53	55.53	656	974	-318	RF
6	PL	2015	Soybeans	GroupA-0428	0.87	0.00	0.65	0.01	632.74	29.66	251	905	-654	RF
AM	PL	2015	Soybeans	GroupA-0429	1.42	0.10	1.23	0.04	1797.09	48.36	1467	905	562	RF
CF	PL	2015	Soybeans	GroupA-0430	0.80	0.01	0.64	0.03	1531.30	27.26	1097	905	192	RF
HB	PL	2015	Soybeans	GroupA-0431	2.12	0.00	1.98	0.02	1056.49	72.37	549	905	-356	RF
PB	PL	2015	Soybeans	GroupA-0432	1.37	0.03	1.21	0.01	2233.71	46.64	327	905	-578	RF
PTB	PL	2015	Soybeans	GroupA-0433	1.27	0.01	1.07	0.01	2192.01	43.19	303	905	-602	RF
PLB	PL	2015	Soybeans	GroupA-0434	0.86	0.00	0.64	0.01	809.82	29.23	499	905	-406	RF
BG	PL	2015	Soybeans	GroupA-0435	2.21	0.00	2.08	0.04	3360.23	75.17	1384	905	479	RF
BBEA	PL	2015	Soybeans	GroupA-0436	2.32	0.05	2.22	0.10	3759.77	79.23	2811	905	1906	RF
BS	PL	2015	Soybeans	GroupA-0437	1.87	0.00	1.73	0.02	3972.53	63.73	659	905	-246	RF
AM	PL	2019	Soybeans	GroupA-0438	0.95	0.00	0.74	0.02	1797.09	29.47	745	968	-223	RF
CF	PL	2019	Soybeans	GroupA-0439	0.70	0.02	0.55	0.03	1531.30	21.76	1095	968	127	RF
HB	PL	2019	Soybeans	GroupA-0440	1.73	0.19	1.62	0.00	1056.49	53.56	174	968	-794	RF
PB	PL	2019	Soybeans	GroupA-0441	1.43	0.09	1.18	0.01	2233.71	44.54	278	968	-690	RF
PE	PL	2019	Soybeans	GroupA-0442	0.90	0.10	0.71	0.03	2576.96	27.80	942	968	-26	RF
PW	PL	2019	Soybeans	GroupA-0443	0.72	0.02	0.55	0.01	2757.07	22.35	259	968	-709	RF
PTB	PL	2019	Soybeans	GroupA-0444	1.85	0.01	1.73	0.01	2192.01	57.28	270	968	-698	RF
PLB	PL	2019	Soybeans	GroupA-0445	0.80	0.18	0.64	0.02	809.82	24.83	502	968	-466	RF
JL	PL	2019	Soybeans	GroupA-0446	0.97	0.17	0.86	0.02	31562.14	30.12	888	968	-80	RF
6	PL	2021	Soybeans	GroupA-0447	2.19	0.06	1.90	0.01	632.74	47.54	246	978	-732	RF
AM	PL	2021	Soybeans	GroupA-0448	1.57	0.00	1.35	0.06	1797.09	33.96	1730	978	752	RF
CF	PL	2021	Soybeans	GroupA-0449	0.93	0.00	0.74	0.03	1531.30	20.13	1090	978	112	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
HB	PL	2021	Soybeans	GroupA-0450	1.27	0.05	1.10	0.01	1056.49	27.48	363	978	-615	RF
NH	PL	2021	Soybeans	GroupA-0451	3.02	0.09	2.78	0.00	2690.61	65.51	51	978	-927	RF
PB	PL	2021	Soybeans	GroupA-0452	1.48	0.02	1.22	0.01	2233.71	32.05	246	978	-732	RF
PE	PL	2021	Soybeans	GroupA-0453	1.01	0.01	0.76	0.03	2576.96	21.83	938	978	-40	RF
PW	PL	2021	Soybeans	GroupA-0454	0.99	0.01	0.82	0.01	2757.07	21.51	246	978	-732	RF
PTB	PL	2021	Soybeans	GroupA-0455	2.78	0.03	2.65	0.01	2192.01	60.36	251	978	-727	RF
PLB	PL	2021	Soybeans	GroupA-0456	0.95	0.00	0.69	0.01	809.82	20.60	491	978	-487	RF
JL	PL	2021	Soybeans	GroupA-0457	0.88	0.00	0.64	0.02	31562.14	19.06	884	978	-94	RF
BS	PL	2021	Soybeans	GroupA-0458	3.88	0.03	3.78	0.00	3972.53	84.18	85	978	-893	RF
CF	PLB	2012	Soybeans	GroupA-0459	0.55	0.04	0.43	0.03	1177.89	15.41	1099	502	597	RF
PB	PLB	2012	Soybeans	GroupA-0460	1.11	0.01	0.99	0.01	1437.03	31.09	335	502	-167	RF
PL	PLB	2012	Soybeans	GroupA-0461	0.50	0.06	0.39	0.02	809.82	14.08	855	502	353	RF
CS	PLB	2012	Soybeans	GroupA-0462	0.69	0.01	0.55	0.05	31271.27	19.27	1942	502	1440	RF
SP	PLB	2012	Soybeans	GroupA-0463	1.48	0.03	1.28	0.05	33608.76	41.48	1929	502	1427	RF
6	PLB	2014	Soybeans	GroupA-0464	1.02	0.00	0.76	0.01	1403.96	27.12	250	500	-250	RF
AM	PLB	2014	Soybeans	GroupA-0465	0.91	0.10	0.75	0.05	2601.80	24.13	1748	500	1248	RF
HB	PLB	2014	Soybeans	GroupA-0466	1.57	0.01	1.37	0.02	1650.52	41.61	555	500	55	RF
PB	PLB	2014	Soybeans	GroupA-0467	1.38	0.05	1.21	0.01	1437.03	36.44	334	500	-166	RF
PTB	PLB	2014	Soybeans	GroupA-0468	1.27	0.13	1.10	0.01	2652.61	33.51	299	500	-201	RF
PL	PLB	2014	Soybeans	GroupA-0469	0.85	0.15	0.63	0.03	809.82	22.37	974	500	474	RF
BG	PLB	2014	Soybeans	GroupA-0470	2.17	0.04	1.99	0.05	2941.78	57.44	1438	500	938	RF
BBEA	PLB	2014	Soybeans	GroupA-0471	2.15	0.15	2.00	0.12	3296.50	56.79	3084	500	2584	RF
SP	PLB	2014	Soybeans	GroupA-0472	2.13	0.00	1.95	0.05	33608.76	56.32	1993	500	1493	RF
BS	PLB	2014	Soybeans	GroupA-0473	2.13	0.04	1.95	0.01	4109.93	56.30	656	500	156	RF
6	PLB	2015	Soybeans	GroupA-0474	0.78	0.03	0.62	0.01	1403.96	34.53	251	499	-248	RF
AM	PLB	2015	Soybeans	GroupA-0475	0.94	0.18	0.80	0.04	2601.80	41.23	1467	499	968	RF
CF	PLB	2015	Soybeans	GroupA-0476	1.21	0.00	0.96	0.03	1177.89	53.24	1097	499	598	RF
HB	PLB	2015	Soybeans	GroupA-0477	1.60	0.10	1.41	0.02	1650.52	70.39	549	499	50	RF
PB	PLB	2015	Soybeans	GroupA-0478	0.90	0.05	0.78	0.01	1437.03	39.59	327	499	-172	RF
PTB	PLB	2015	Soybeans	GroupA-0479	0.84	0.02	0.73	0.01	2652.61	37.03	303	499	-196	RF
PL	PLB	2015	Soybeans	GroupA-0480	1.09	0.02	0.82	0.02	809.82	47.80	905	499	406	RF
BG	PLB	2015	Soybeans	GroupA-0481	1.62	0.02	1.43	0.04	2941.78	71.14	1384	499	885	RF
BBEA	PLB	2015	Soybeans	GroupA-0482	1.55	0.00	1.36	0.10	3296.50	68.15	2811	499	2312	RF
BS	PLB	2015	Soybeans	GroupA-0483	1.32	0.21	1.16	0.01	4109.93	57.97	659	499	160	RF
AM	PLB	2019	Soybeans	GroupA-0484	0.88	0.33	0.72	0.02	2601.80	31.45	745	502	243	RF
CF	PLB	2019	Soybeans	GroupA-0485	1.11	0.02	0.85	0.03	1177.89	39.73	1095	502	593	RF
HB	PLB	2019	Soybeans	GroupA-0486	1.58	0.02	1.35	0.00	1650.52	56.41	174	502	-328	RF
PB	PLB	2019	Soybeans	GroupA-0487	1.31	0.05	1.11	0.01	1437.03	46.60	278	502	-224	RF
PE	PLB	2019	Soybeans	GroupA-0488	1.39	0.01	1.08	0.03	1832.05	49.49	942	502	440	RF
PW	PLB	2019	Soybeans	GroupA-0489	1.30	0.11	0.96	0.01	2110.84	46.22	259	502	-243	RF
PTB	PLB	2019	Soybeans	GroupA-0490	1.67	0.13	1.45	0.01	2652.61	59.51	270	502	-232	RF
PL	PLB	2019	Soybeans	GroupA-0491	0.94	0.31	0.67	0.03	809.82	33.63	968	502	466	RF
JL	PLB	2019	Soybeans	GroupA-0492	1.03	0.01	0.91	0.02	31878.96	36.77	888	502	386	RF
6	PLB	2021	Soybeans	GroupA-0493	2.33	0.01	2.15	0.01	1403.96	56.26	246	491	-245	RF
AM	PLB	2021	Soybeans	GroupA-0494	1.52	0.13	1.35	0.06	2601.80	36.68	1730	491	1239	RF
CF	PLB	2021	Soybeans	GroupA-0495	1.33	0.02	0.93	0.03	1177.89	32.17	1090	491	599	RF
HB	PLB	2021	Soybeans	GroupA-0496	1.35	0.00	1.11	0.01	1650.52	32.67	363	491	-128	RF
NH	PLB	2021	Soybeans	GroupA-0497	2.98	0.05	2.79	0.00	3474.91	72.11	51	491	-440	RF
PB	PLB	2021	Soybeans	GroupA-0498	1.42	0.00	1.14	0.01	1437.03	34.29	246	491	-245	RF
PE	PLB	2021	Soybeans	GroupA-0499	1.56	0.00	1.08	0.03	1832.05	37.77	938	491	447	RF
PW	PLB	2021	Soybeans	GroupA-0500	1.70	0.16	1.23	0.01	2110.84	41.15	246	491	-245	RF
PTB	PLB	2021	Soybeans	GroupA-0501	2.54	0.02	2.34	0.01	2652.61	61.28	251	491	-240	RF
PL	PLB	2021	Soybeans	GroupA-0502	1.22	0.08	0.87	0.03	809.82	29.55	978	491	487	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
JL	PLB	2021	Soybeans	GroupA-0503	1.40	0.03	0.93	0.02	31878.96	33.94	884	491	393	RF
BS	PLB	2021	Soybeans	GroupA-0504	3.65	0.04	3.44	0.00	4109.93	88.16	85	491	-406	RF
6	BG	2013	Soybeans	GroupA-0505	1.06	0.02	0.85	0.01	3938.74	30.40	249	1438	-1189	RF
AM	BG	2013	Soybeans	GroupA-0506	1.43	0.00	1.18	0.04	4801.99	41.13	1748	1438	310	RF
HB	BG	2013	Soybeans	GroupA-0507	1.34	0.09	1.14	0.01	4415.29	38.45	558	1438	-880	RF
NH	BG	2013	Soybeans	GroupA-0508	2.42	0.01	2.14	0.00	4995.12	69.34	173	1438	-1265	RF
PTB	BG	2013	Soybeans	GroupA-0509	1.08	0.05	0.88	0.01	5528.32	30.95	289	1438	-1149	RF
BBEA	BG	2013	Soybeans	GroupA-0510	1.22	0.32	1.03	0.11	438.12	34.88	3081	1438	1643	RF
AA	BG	2013	Soybeans	GroupA-0511	2.83	0.00	2.64	0.01	33970.15	81.17	378	1438	-1060	RF
SP	BG	2013	Soybeans	GroupA-0512	2.72	0.05	2.52	0.05	36543.85	78.09	1994	1438	556	RF
BS	BG	2013	Soybeans	GroupA-0513	1.52	0.00	1.26	0.02	7029.70	43.67	656	1438	-782	RF
HB	BG	2014	Soybeans	GroupA-0516	1.27	0.01	1.07	0.01	4415.29	72.47	555	1438	-883	RF
PB	BG	2014	Soybeans	GroupA-0517	1.09	0.01	0.90	0.01	3001.92	62.41	334	1438	-1104	RF
PTB	BG	2014	Soybeans	GroupA-0518	1.42	0.08	1.26	0.01	5528.32	80.97	299	1438	-1139	RF
BBEA	BG	2014	Soybeans	GroupA-0521	0.65	0.02	0.54	0.12	438.12	37.29	3084	1438	1646	RF
SP	BG	2014	Soybeans	GroupA-0522	0.72	0.01	0.59	0.05	36543.85	40.83	1993	1438	555	RF
BS	BG	2014	Soybeans	GroupA-0523	0.73	0.01	0.61	0.01	7029.70	41.90	656	1438	-782	RF
HB	BG	2015	Soybeans	GroupA-0527	0.61	0.14	0.49	0.01	4415.29	74.56	549	1384	-835	RF
BBEA	BG	2015	Soybeans	GroupA-0532	0.50	0.17	0.41	0.10	438.12	61.90	2811	1384	1427	RF
BS	BG	2015	Soybeans	GroupA-0533	0.64	0.00	0.56	0.01	7029.70	79.24	659	1384	-725	RF
6	BG	2020	Soybeans	GroupA-0534	1.00	0.02	0.83	0.01	3938.74	26.64	247	1436	-1189	RF
AM	BG	2020	Soybeans	GroupA-0535	0.91	0.00	0.70	0.02	4801.99	24.36	991	1436	-445	RF
HB	BG	2020	Soybeans	GroupA-0536	1.29	0.03	1.06	0.01	4415.29	34.36	555	1436	-881	RF
NH	BG	2020	Soybeans	GroupA-0537	2.17	0.01	1.96	0.00	4995.12	57.79	181	1436	-1255	RF
PTB	BG	2020	Soybeans	GroupA-0538	2.06	0.01	1.90	0.01	5528.32	54.92	262	1436	-1174	RF
BBEA	BG	2020	Soybeans	GroupA-0539	0.82	0.09	0.66	0.12	438.12	21.86	3036	1436	1600	RF
BS	BG	2020	Soybeans	GroupA-0540	1.38	0.01	1.16	0.02	7029.70	36.69	748	1436	-688	RF
6	BBEA	2013	Soybeans	GroupA-0541	1.11	0.00	0.90	0.01	4348.89	40.28	249	3081	-2832	RF
AM	BBEA	2013	Soybeans	GroupA-0542	1.02	0.01	0.82	0.04	5233.55	37.08	1748	3081	-1333	RF
HB	BBEA	2013	Soybeans	GroupA-0543	0.96	0.00	0.77	0.01	4811.25	34.65	558	3081	-2523	RF
NH	BBEA	2013	Soybeans	GroupA-0544	1.90	0.00	1.64	0.00	5431.98	68.74	173	3081	-2908	RF
PTB	BBEA	2013	Soybeans	GroupA-0545	1.19	0.00	0.96	0.01	5911.78	43.09	289	3081	-2792	RF
BG	BBEA	2013	Soybeans	GroupA-0546	1.14	0.16	0.90	0.03	438.12	41.41	1438	3081	-1643	RF
AA	BBEA	2013	Soybeans	GroupA-0547	2.06	0.03	1.86	0.01	34316.27	74.57	378	3081	-2703	RF
SP	BBEA	2013	Soybeans	GroupA-0548	2.01	0.00	1.80	0.05	36905.03	73.01	1994	3081	-1087	RF
BS	BBEA	2013	Soybeans	GroupA-0549	1.08	0.02	0.88	0.02	7352.54	39.21	656	3081	-2425	RF
AM	BBEA	2014	Soybeans	GroupA-0551	1.74	0.01	1.56	0.04	5233.55	95.86	1748	3084	-1336	RF
HB	BBEA	2014	Soybeans	GroupA-0552	1.17	0.00	0.93	0.01	4811.25	64.71	555	3084	-2529	RF
PB	BBEA	2014	Soybeans	GroupA-0553	0.98	0.01	0.79	0.01	3203.03	54.03	334	3084	-2750	RF
PTB	BBEA	2014	Soybeans	GroupA-0554	1.39	0.00	1.17	0.01	5911.78	76.75	299	3084	-2785	RF
BG	BBEA	2014	Soybeans	GroupA-0557	0.79	0.01	0.65	0.03	438.12	43.82	1438	3084	-1646	RF
SP	BBEA	2014	Soybeans	GroupA-0558	0.77	0.00	0.63	0.05	36905.03	42.38	1993	3084	-1091	RF
BS	BBEA	2014	Soybeans	GroupA-0559	0.81	0.00	0.67	0.01	7352.54	44.84	656	3084	-2428	RF
HB	BBEA	2015	Soybeans	GroupA-0563	0.66	0.11	0.54	0.01	4811.25	87.46	549	2811	-2262	RF
BG	BBEA	2015	Soybeans	GroupA-0568	0.51	0.22	0.41	0.03	438.12	67.60	1384	2811	-1427	RF
BS	BBEA	2015	Soybeans	GroupA-0569	0.68	0.00	0.60	0.01	7352.54	90.64	659	2811	-2152	RF
6	BBEA	2020	Soybeans	GroupA-0570	0.99	0.00	0.79	0.01	4348.89	29.26	247	3036	-2789	RF
AM	BBEA	2020	Soybeans	GroupA-0571	1.13	0.00	0.82	0.02	5233.55	33.62	991	3036	-2045	RF
HB	BBEA	2020	Soybeans	GroupA-0572	1.21	0.02	0.98	0.01	4811.25	35.79	555	3036	-2481	RF
NH	BBEA	2020	Soybeans	GroupA-0573	1.75	0.02	1.44	0.00	5431.98	51.78	181	3036	-2855	RF
PTB	BBEA	2020	Soybeans	GroupA-0574	1.85	0.00	1.68	0.01	5911.78	54.84	262	3036	-2774	RF
BG	BBEA	2020	Soybeans	GroupA-0575	0.98	0.10	0.70	0.03	438.12	29.11	1436	3036	-1600	RF
BS	BBEA	2020	Soybeans	GroupA-0576	1.14	0.02	0.92	0.02	7352.54	33.82	748	3036	-2288	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CS	AA	2013	Soybeans	GroupA-0577	0.94	0.01	0.82	0.07	1521.14	85.30	2440	378	2062	RF
RD	AA	2014	Soybeans	GroupA-0579	1.08	0.12	0.78	0.03	28035.93	27.68	1259	3968	-2709	RF
1P	AA	2019	Soybeans	GroupA-0580	1.04	0.07	0.87	0.02	14966.67	27.13	770	3976	-3206	RF
2PB	AA	2019	Soybeans	GroupA-0581	0.71	0.07	0.55	0.04	14577.73	18.65	1767	3976	-2209	RF
1P	AA	2021	Soybeans	GroupA-0582	0.77	0.00	0.61	0.02	14966.67	16.64	770	3966	-3196	RF
2PB	AA	2021	Soybeans	GroupA-0583	0.75	0.00	0.60	0.04	14577.73	16.28	1771	3966	-2195	RF
RD	AA	2021	Soybeans	GroupA-0584	1.71	0.00	1.56	0.03	28035.93	36.98	1259	3966	-2707	RF
RD	CS	2013	Soybeans	GroupA-0585	1.09	0.16	0.84	0.03	28340.32	44.10	1256	2440	-1184	RF
SP	CS	2020	Soybeans	GroupA-0586	0.82	0.03	0.67	0.06	2392.70	17.14	1984	2437	-453	RF
MP	CS	2020	Soybeans	GroupA-0587	1.05	0.08	0.88	0.02	10327.57	21.94	954	2437	-1483	RF
RD	CS	2020	Soybeans	GroupA-0588	1.99	0.00	1.87	0.03	28340.32	41.46	1254	2437	-1183	RF
AM	JL	2019	Soybeans	GroupA-0589	0.64	0.01	0.53	0.02	30699.89	29.20	745	888	-143	RF
CF	JL	2019	Soybeans	GroupA-0590	1.20	0.00	1.08	0.03	30895.46	55.12	1095	888	207	RF
HB	JL	2019	Soybeans	GroupA-0591	0.85	0.06	0.71	0.00	30527.42	39.25	174	888	-714	RF
PB	JL	2019	Soybeans	GroupA-0592	0.81	0.03	0.64	0.01	32178.80	37.32	278	888	-610	RF
PE	JL	2019	Soybeans	GroupA-0593	1.56	0.01	1.45	0.02	31805.51	71.62	942	888	54	RF
PW	JL	2019	Soybeans	GroupA-0594	1.47	0.00	1.38	0.01	31235.93	67.69	259	888	-629	RF
PTB	JL	2019	Soybeans	GroupA-0595	0.71	0.01	0.57	0.01	29375.83	32.69	270	888	-618	RF
PL	JL	2019	Soybeans	GroupA-0596	1.11	0.05	0.99	0.02	31562.14	50.84	968	888	80	RF
PLB	JL	2019	Soybeans	GroupA-0597	0.74	0.01	0.60	0.01	31878.96	34.22	502	888	-386	RF
6	JL	2021	Soybeans	GroupA-0598	2.25	0.01	2.06	0.01	31086.42	49.52	246	884	-638	RF
AM	JL	2021	Soybeans	GroupA-0599	1.76	0.00	1.59	0.05	30699.89	38.85	1730	884	846	RF
CF	JL	2021	Soybeans	GroupA-0600	0.77	0.00	0.61	0.03	30895.46	16.90	1090	884	206	RF
HB	JL	2021	Soybeans	GroupA-0601	1.15	0.00	0.97	0.01	30527.42	25.39	363	884	-521	RF
NH	JL	2021	Soybeans	GroupA-0602	3.28	0.01	3.19	0.00	31398.77	72.31	51	884	-833	RF
PB	JL	2021	Soybeans	GroupA-0603	1.24	0.00	1.02	0.01	32178.80	27.33	246	884	-638	RF
PE	JL	2021	Soybeans	GroupA-0604	1.01	0.01	0.82	0.02	31805.51	22.24	938	884	54	RF
PW	JL	2021	Soybeans	GroupA-0605	0.80	0.01	0.63	0.01	31235.93	17.53	246	884	-638	RF
PTB	JL	2021	Soybeans	GroupA-0606	2.51	0.02	2.41	0.01	29375.83	55.35	251	884	-633	RF
PL	JL	2021	Soybeans	GroupA-0607	0.73	0.00	0.56	0.02	31562.14	16.14	978	884	94	RF
PLB	JL	2021	Soybeans	GroupA-0608	0.86	0.01	0.67	0.01	31878.96	18.98	491	884	-393	RF
BS	JL	2021	Soybeans	GroupA-0609	4.01	0.01	3.96	0.00	27818.58	88.37	85	884	-799	RF
CS	SP	2013	Soybeans	GroupA-0610	0.93	0.15	0.84	0.06	2392.70	91.44	2440	1994	446	RF
AA	SP	2014	Soybeans	GroupA-0612	1.16	0.03	0.93	0.14	3305.23	54.84	3968	1993	1975	RF
RD	SP	2014	Soybeans	GroupA-0613	1.33	0.01	1.10	0.03	30697.43	62.72	1259	1993	-734	RF
CS	SP	2020	Soybeans	GroupA-0614	0.62	0.05	0.47	0.07	2392.70	14.40	2437	1984	453	RF
MP	SP	2020	Soybeans	GroupA-0615	0.75	0.19	0.59	0.02	10398.84	17.39	954	1984	-1030	RF
RD	SP	2020	Soybeans	GroupA-0616	1.57	0.01	1.46	0.03	30697.43	36.10	1254	1984	-730	RF
AA	1P	2019	Soybeans	GroupA-0617	0.86	0.12	0.66	0.12	14966.67	24.55	3976	770	3206	RF
2PB	1P	2019	Soybeans	GroupA-0618	0.73	0.36	0.55	0.05	884.63	20.83	1767	770	997	RF
AA	1P	2021	Soybeans	GroupA-0619	0.75	0.00	0.60	0.12	14966.67	15.69	3966	770	3196	RF
2PB	1P	2021	Soybeans	GroupA-0620	0.95	0.06	0.82	0.05	884.63	19.83	1771	770	1001	RF
RD	1P	2021	Soybeans	GroupA-0621	1.44	0.02	1.27	0.03	28988.76	30.19	1259	770	489	RF
AA	2PB	2019	Soybeans	GroupA-0622	0.91	0.04	0.74	0.11	14577.73	25.04	3976	1767	2209	RF
1P	2PB	2019	Soybeans	GroupA-0623	1.00	0.06	0.80	0.02	884.63	27.37	770	1767	-997	RF
AA	2PB	2021	Soybeans	GroupA-0624	0.80	0.01	0.59	0.11	14577.73	18.83	3966	1771	2195	RF
1P	2PB	2021	Soybeans	GroupA-0625	0.91	0.02	0.71	0.02	884.63	21.43	770	1771	-1001	RF
RD	2PB	2021	Soybeans	GroupA-0626	1.15	0.00	0.92	0.03	29606.60	27.18	1259	1771	-512	RF
CS	MP	2020	Soybeans	GroupA-0627	0.86	0.47	0.68	0.07	10327.57	22.41	2437	954	1483	RF
SP	MP	2020	Soybeans	GroupA-0628	1.09	0.01	0.82	0.06	10398.84	28.35	1984	954	1030	RF
RD	MP	2020	Soybeans	GroupA-0629	1.55	0.20	1.39	0.03	29241.14	40.45	1254	954	300	RF
6	BS	2013	Soybeans	GroupA-0630	0.87	0.05	0.62	0.01	3688.53	27.22	249	656	-407	RF
AM	BS	2013	Soybeans	GroupA-0631	0.78	0.07	0.60	0.04	4011.02	24.36	1748	656	1092	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
HB	BS	2013	Soybeans	GroupA-0632	0.87	0.02	0.74	0.01	3100.07	27.21	558	656	-98	RF
NH	BS	2013	Soybeans	GroupA-0633	1.93	0.00	1.64	0.01	5253.94	60.68	173	656	-483	RF
PTB	BS	2013	Soybeans	GroupA-0634	0.92	0.00	0.65	0.01	2114.72	28.97	289	656	-367	RF
BG	BS	2013	Soybeans	GroupA-0635	0.94	0.01	0.69	0.04	7029.70	29.62	1438	656	782	RF
BBEA	BS	2013	Soybeans	GroupA-0636	1.21	0.09	1.07	0.11	7352.54	38.10	3081	656	2425	RF
AA	BS	2013	Soybeans	GroupA-0637	2.39	0.00	2.27	0.01	26984.06	75.25	378	656	-278	RF
SP	BS	2013	Soybeans	GroupA-0638	2.44	0.00	2.31	0.05	29622.57	76.58	1994	656	1338	RF
6	BS	2014	Soybeans	GroupA-0639	2.01	0.03	1.76	0.01	3688.53	83.65	250	656	-406	RF
AM	BS	2014	Soybeans	GroupA-0640	1.75	0.07	1.49	0.05	4011.02	72.70	1748	656	1092	RF
HB	BS	2014	Soybeans	GroupA-0641	1.09	0.01	0.83	0.01	3100.07	45.47	555	656	-101	RF
PB	BS	2014	Soybeans	GroupA-0642	0.95	0.08	0.76	0.01	4411.96	39.72	334	656	-322	RF
PTB	BS	2014	Soybeans	GroupA-0643	1.22	0.02	0.89	0.01	2114.72	50.73	299	656	-357	RF
PL	BS	2014	Soybeans	GroupA-0644	1.58	0.04	1.31	0.02	3972.53	65.87	974	656	318	RF
PLB	BS	2014	Soybeans	GroupA-0645	1.51	0.06	1.21	0.01	4109.93	63.03	500	656	-156	RF
BG	BS	2014	Soybeans	GroupA-0646	1.31	0.00	1.14	0.05	7029.70	54.35	1438	656	782	RF
BBEA	BS	2014	Soybeans	GroupA-0647	1.16	0.05	1.02	0.12	7352.54	48.33	3084	656	2428	RF
SP	BS	2014	Soybeans	GroupA-0648	1.18	0.00	1.03	0.05	29622.57	49.12	1993	656	1337	RF
6	BS	2015	Soybeans	GroupA-0649	1.25	0.02	1.09	0.01	3688.53	90.91	251	659	-408	RF
AM	BS	2015	Soybeans	GroupA-0650	0.87	0.05	0.69	0.04	4011.02	63.31	1467	659	808	RF
HB	BS	2015	Soybeans	GroupA-0652	0.80	0.01	0.67	0.01	3100.07	58.40	549	659	-110	RF
PB	BS	2015	Soybeans	GroupA-0653	0.67	0.02	0.56	0.01	4411.96	48.51	327	659	-332	RF
PTB	BS	2015	Soybeans	GroupA-0654	0.81	0.01	0.64	0.01	2114.72	58.97	303	659	-356	RF
PL	BS	2015	Soybeans	GroupA-0655	1.24	0.00	1.07	0.02	3972.53	90.34	905	659	246	RF
PLB	BS	2015	Soybeans	GroupA-0656	1.12	0.06	0.97	0.01	4109.93	81.72	499	659	-160	RF
BG	BS	2015	Soybeans	GroupA-0657	0.83	0.00	0.69	0.04	7029.70	60.50	1384	659	725	RF
BBEA	BS	2015	Soybeans	GroupA-0658	0.95	0.02	0.80	0.10	7352.54	69.38	2811	659	2152	RF
CF	BS	2016	Soybeans	GroupA-0659	1.14	0.02	0.96	0.03	3076.95	45.20	1083	655	428	RF
HB	BS	2016	Soybeans	GroupA-0660	0.83	0.01	0.71	0.00	3100.07	32.86	181	655	-474	RF
PB	BS	2016	Soybeans	GroupA-0661	0.82	0.00	0.71	0.01	4411.96	32.51	331	655	-324	RF
PTB	BS	2016	Soybeans	GroupA-0662	0.66	0.02	0.53	0.01	2114.72	26.12	297	655	-358	RF
HB	BS	2018	Soybeans	GroupA-0663	1.03	0.04	0.86	0.01	3100.07	27.20	184	752	-568	RF
PB	BS	2018	Soybeans	GroupA-0664	1.76	0.02	1.58	0.01	4411.96	46.46	327	752	-425	RF
PE	BS	2018	Soybeans	GroupA-0665	1.17	0.01	0.88	0.02	4129.23	31.02	941	752	189	RF
PW	BS	2018	Soybeans	GroupA-0666	1.32	0.00	1.02	0.01	3638.27	34.78	257	752	-495	RF
PTB	BS	2018	Soybeans	GroupA-0667	1.00	0.00	0.71	0.01	2114.72	26.42	289	752	-463	RF
6	BS	2020	Soybeans	GroupA-0668	0.85	0.02	0.67	0.01	3688.53	24.88	247	748	-501	RF
AM	BS	2020	Soybeans	GroupA-0669	1.04	0.00	0.75	0.02	4011.02	30.62	991	748	243	RF
HB	BS	2020	Soybeans	GroupA-0670	1.01	0.03	0.82	0.01	3100.07	29.69	555	748	-193	RF
NH	BS	2020	Soybeans	GroupA-0671	1.62	0.19	1.32	0.01	5253.94	47.53	181	748	-567	RF
PTB	BS	2020	Soybeans	GroupA-0672	1.86	0.01	1.70	0.01	2114.72	54.75	262	748	-486	RF
BG	BS	2020	Soybeans	GroupA-0673	0.96	0.01	0.67	0.05	7029.70	28.17	1436	748	688	RF
BBEA	BS	2020	Soybeans	GroupA-0674	0.92	0.04	0.74	0.12	7352.54	26.97	3036	748	2288	RF
PTB	BS	2021	Soybeans	GroupA-0683	1.07	0.09	0.98	0.01	2114.72	98.63	251	85	166	RF
CS	RD	2013	Soybeans	GroupA-0687	1.82	0.16	1.65	0.06	28340.32	50.38	2440	1256	1184	RF
AA	RD	2014	Soybeans	GroupA-0688	1.33	0.24	1.18	0.13	28035.93	29.11	3968	1259	2709	RF
CS	RD	2020	Soybeans	GroupA-0689	1.13	0.05	0.86	0.07	28340.32	31.10	2437	1254	1183	RF
SP	RD	2020	Soybeans	GroupA-0690	1.35	0.01	1.08	0.05	30697.43	37.17	1984	1254	730	RF
MP	RD	2020	Soybeans	GroupA-0691	0.94	0.08	0.71	0.02	29241.14	25.88	954	1254	-300	RF
AA	RD	2021	Soybeans	GroupA-0692	1.35	0.00	0.95	0.13	28035.93	35.17	3966	1259	2707	RF
1P	RD	2021	Soybeans	GroupA-0693	1.34	0.04	0.97	0.02	28988.76	34.95	770	1259	-489	RF
2PB	RD	2021	Soybeans	GroupA-0694	1.37	0.07	0.98	0.05	29606.60	35.69	1771	1259	512	RF
AM	6	2016	Corn	GroupA-0695	1.21	0.01	1.00	0.06	1216.49	13.43	1759	249	1510	RF
HB	6	2016	Corn	GroupA-0696	1.22	0.00	0.91	0.01	593.20	13.57	366	249	117	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
NH	6	2016	Corn	GroupA-0697	1.94	0.03	1.71	0.00	2271.12	21.50	222	249	-27	RF
PL	6	2016	Corn	GroupA-0698	1.14	0.02	0.93	0.03	632.74	12.60	978	249	729	RF
PLB	6	2016	Corn	GroupA-0699	1.18	0.01	0.97	0.02	1403.96	13.08	501	249	252	RF
BG	6	2016	Corn	GroupA-0700	1.30	0.03	1.09	0.05	3938.74	14.40	1426	249	1177	RF
BBEA	6	2016	Corn	GroupA-0701	1.25	0.16	1.01	0.12	4348.89	13.85	3066	249	2817	RF
AM	6	2017	Corn	GroupA-0702	2.59	0.01	2.18	0.06	1216.49	21.40	1746	248	1498	RF
CF	6	2017	Corn	GroupA-0703	2.36	0.00	2.05	0.04	1790.97	19.54	1099	248	851	RF
HB	6	2017	Corn	GroupA-0704	2.92	0.06	2.47	0.02	593.20	24.17	557	248	309	RF
NH	6	2017	Corn	GroupA-0705	3.19	0.01	2.64	0.01	2271.12	26.39	226	248	-22	RF
PB	6	2017	Corn	GroupA-0706	2.60	0.04	2.21	0.01	2775.62	21.51	338	248	90	RF
PTB	6	2017	Corn	GroupA-0707	6.78	0.02	6.41	0.01	1728.12	56.11	296	248	48	RF
PL	6	2017	Corn	GroupA-0708	2.67	0.13	2.25	0.03	632.74	22.06	979	248	731	RF
PLB	6	2017	Corn	GroupA-0709	3.45	0.02	2.94	0.01	1403.96	28.55	508	248	260	RF
BG	6	2017	Corn	GroupA-0710	3.22	0.00	2.71	0.05	3938.74	26.61	1426	248	1178	RF
BBEA	6	2017	Corn	GroupA-0711	2.57	0.00	2.20	0.11	4348.89	21.30	2889	248	2641	RF
JL	6	2017	Corn	GroupA-0712	2.69	0.01	2.31	0.02	31086.42	22.23	862	248	614	RF
BS	6	2017	Corn	GroupA-0713	3.60	0.01	3.04	0.02	3688.53	29.76	757	248	509	RF
AM	6	2018	Corn	GroupA-0714	2.42	0.05	2.02	0.06	1216.49	30.65	1727	244	1483	RF
CF	6	2018	Corn	GroupA-0715	2.77	0.00	2.12	0.03	1790.97	35.15	1098	244	854	RF
HB	6	2018	Corn	GroupA-0716	3.82	0.03	3.35	0.01	593.20	48.42	363	244	119	RF
NH	6	2018	Corn	GroupA-0717	3.19	0.03	2.70	0.00	2271.12	40.51	222	244	-22	RF
PL	6	2018	Corn	GroupA-0718	2.23	0.11	1.88	0.03	632.74	28.30	974	244	730	RF
PLB	6	2018	Corn	GroupA-0719	3.09	0.01	2.62	0.02	1403.96	39.25	506	244	262	RF
BG	6	2018	Corn	GroupA-0720	2.25	0.11	1.84	0.05	3938.74	28.54	1421	244	1177	RF
BBEA	6	2018	Corn	GroupA-0721	2.27	0.03	1.93	0.11	4348.89	28.84	3047	244	2803	RF
JL	6	2018	Corn	GroupA-0722	2.88	0.05	2.45	0.02	31086.42	36.49	901	244	657	RF
AM	6	2019	Corn	GroupA-0723	1.18	0.15	0.97	0.03	1216.49	17.84	992	246	746	RF
HB	6	2019	Corn	GroupA-0724	1.72	0.11	1.35	0.01	593.20	25.95	365	246	119	RF
NH	6	2019	Corn	GroupA-0725	1.38	0.00	1.09	0.00	2271.12	20.83	215	246	-31	RF
BG	6	2019	Corn	GroupA-0726	1.79	0.11	1.54	0.05	3938.74	27.05	1428	246	1182	RF
BBEA	6	2019	Corn	GroupA-0727	1.46	0.00	1.20	0.12	4348.89	22.08	3067	246	2821	RF
BS	6	2019	Corn	GroupA-0728	3.48	0.00	3.18	0.02	3688.53	52.68	749	246	503	RF
NH	AM	2015	Corn	GroupA-0729	1.30	0.00	1.06	0.01	1283.59	18.21	221	276	-55	RF
PL	AM	2015	Corn	GroupA-0730	1.90	0.08	1.57	0.00	1797.09	26.65	55	276	-221	RF
6	AM	2016	Corn	GroupA-0731	1.07	0.00	0.82	0.01	1216.49	12.09	249	1759	-1510	RF
HB	AM	2016	Corn	GroupA-0732	1.18	0.02	0.87	0.01	1351.32	13.39	366	1759	-1393	RF
NH	AM	2016	Corn	GroupA-0733	1.67	0.00	1.43	0.01	1283.59	18.92	222	1759	-1537	RF
PL	AM	2016	Corn	GroupA-0734	1.26	0.00	0.97	0.03	1797.09	14.22	978	1759	-781	RF
PLB	AM	2016	Corn	GroupA-0735	1.12	0.01	0.85	0.01	2601.80	12.61	501	1759	-1258	RF
BG	AM	2016	Corn	GroupA-0736	1.26	0.02	0.97	0.04	4801.99	14.21	1426	1759	-333	RF
BBEA	AM	2016	Corn	GroupA-0737	1.26	0.02	1.03	0.10	5233.55	14.30	3066	1759	1307	RF
6	AM	2017	Corn	GroupA-0738	2.54	0.02	2.09	0.01	1216.49	21.13	248	1746	-1498	RF
CF	AM	2017	Corn	GroupA-0739	2.36	0.00	2.02	0.03	2925.31	19.56	1099	1746	-647	RF
HB	AM	2017	Corn	GroupA-0740	4.49	0.00	3.80	0.01	1351.32	37.27	557	1746	-1189	RF
NH	AM	2017	Corn	GroupA-0741	3.41	0.00	2.92	0.01	1283.59	28.34	226	1746	-1520	RF
PB	AM	2017	Corn	GroupA-0742	2.42	0.00	2.05	0.01	3991.90	20.11	338	1746	-1408	RF
PTB	AM	2017	Corn	GroupA-0743	6.42	0.01	6.06	0.01	1901.85	53.29	296	1746	-1450	RF
PL	AM	2017	Corn	GroupA-0744	3.12	0.01	2.68	0.02	1797.09	25.88	979	1746	-767	RF
PLB	AM	2017	Corn	GroupA-0745	2.97	0.00	2.55	0.01	2601.80	24.63	508	1746	-1238	RF
BG	AM	2017	Corn	GroupA-0746	2.84	0.00	2.45	0.04	4801.99	23.58	1426	1746	-320	RF
BBEA	AM	2017	Corn	GroupA-0747	2.41	0.00	2.04	0.09	5233.55	20.04	2889	1746	1143	RF
JL	AM	2017	Corn	GroupA-0748	2.40	0.00	1.88	0.02	30699.89	19.93	862	1746	-884	RF
BS	AM	2017	Corn	GroupA-0749	3.49	0.00	2.96	0.02	4011.02	28.96	757	1746	-989	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
6	AM	2018	Corn	GroupA-0750	2.21	0.05	1.82	0.01	1216.49	27.87	244	1727	-1483	RF
CF	AM	2018	Corn	GroupA-0751	2.44	0.08	1.81	0.03	2925.31	30.77	1098	1727	-629	RF
HB	AM	2018	Corn	GroupA-0752	3.10	0.04	2.56	0.01	1351.32	39.09	363	1727	-1364	RF
NH	AM	2018	Corn	GroupA-0753	3.10	0.03	2.67	0.01	1283.59	39.08	222	1727	-1505	RF
PL	AM	2018	Corn	GroupA-0754	2.39	0.00	2.04	0.02	1797.09	30.03	974	1727	-753	RF
PLB	AM	2018	Corn	GroupA-0755	2.21	0.03	1.86	0.01	2601.80	27.83	506	1727	-1221	RF
BG	AM	2018	Corn	GroupA-0756	2.05	0.06	1.53	0.04	4801.99	25.85	1421	1727	-306	RF
BBEA	AM	2018	Corn	GroupA-0757	2.07	0.00	1.65	0.09	5233.55	26.04	3047	1727	1320	RF
JL	AM	2018	Corn	GroupA-0758	2.28	0.03	1.88	0.02	30699.89	28.65	901	1727	-826	RF
6	AM	2019	Corn	GroupA-0759	1.17	0.07	0.90	0.01	1216.49	18.39	246	992	-746	RF
HB	AM	2019	Corn	GroupA-0760	1.51	0.08	1.21	0.01	1351.32	23.73	365	992	-627	RF
NH	AM	2019	Corn	GroupA-0761	1.53	0.03	1.21	0.00	1283.59	24.05	215	992	-777	RF
BG	AM	2019	Corn	GroupA-0762	2.02	0.01	1.76	0.04	4801.99	31.79	1428	992	436	RF
BBEA	AM	2019	Corn	GroupA-0763	1.43	0.03	1.15	0.10	5233.55	22.55	3067	992	2075	RF
BS	AM	2019	Corn	GroupA-0764	3.04	0.00	2.67	0.02	4011.02	47.99	749	992	-243	RF
CF	AM	2020	Corn	GroupA-0765	1.76	0.01	1.40	0.03	2925.31	22.77	1095	742	353	RF
PB	AM	2020	Corn	GroupA-0766	2.00	0.01	1.66	0.01	3991.90	25.85	333	742	-409	RF
PE	AM	2020	Corn	GroupA-0767	4.17	0.03	3.92	0.02	4256.93	53.86	942	742	200	RF
PW	AM	2020	Corn	GroupA-0768	2.89	0.02	2.55	0.01	4299.79	37.38	260	742	-482	RF
PL	AM	2020	Corn	GroupA-0769	1.44	0.02	1.13	0.02	1797.09	18.67	976	742	234	RF
PLB	AM	2020	Corn	GroupA-0770	2.22	0.11	1.82	0.01	2601.80	28.63	498	742	-244	RF
JL	AM	2020	Corn	GroupA-0771	3.14	0.02	2.79	0.02	30699.89	40.53	889	742	147	RF
PB	CF	2013	Corn	GroupA-0772	1.17	0.01	0.94	0.01	1477.63	13.16	327	1093	-766	RF
PL	CF	2013	Corn	GroupA-0773	1.47	0.00	1.15	0.03	1531.30	16.54	972	1093	-121	RF
PLB	CF	2013	Corn	GroupA-0774	1.75	0.08	1.46	0.01	1177.89	19.68	503	1093	-590	RF
NH	CF	2014	Corn	GroupA-0775	2.89	0.03	2.36	0.01	4061.52	23.91	223	1086	-863	RF
6	CF	2017	Corn	GroupA-0776	2.18	0.02	1.84	0.01	1790.97	19.89	248	1099	-851	RF
AM	CF	2017	Corn	GroupA-0777	1.94	0.00	1.57	0.06	2925.31	17.73	1746	1099	647	RF
HB	CF	2017	Corn	GroupA-0778	2.74	0.01	2.12	0.01	1609.48	25.05	557	1099	-542	RF
NH	CF	2017	Corn	GroupA-0779	3.73	0.01	3.25	0.00	4061.52	34.10	226	1099	-873	RF
PB	CF	2017	Corn	GroupA-0780	1.76	0.03	1.34	0.01	1477.63	16.04	338	1099	-761	RF
PTB	CF	2017	Corn	GroupA-0781	5.01	0.03	4.63	0.01	2125.67	45.78	296	1099	-803	RF
PL	CF	2017	Corn	GroupA-0782	1.86	0.00	1.36	0.03	1531.30	17.00	979	1099	-120	RF
PLB	CF	2017	Corn	GroupA-0783	1.89	0.03	1.49	0.01	1177.89	17.32	508	1099	-591	RF
BG	CF	2017	Corn	GroupA-0784	2.34	0.09	1.67	0.05	3976.07	21.38	1426	1099	327	RF
BBEA	CF	2017	Corn	GroupA-0785	2.18	0.07	1.65	0.11	4282.54	19.93	2889	1099	1790	RF
JL	CF	2017	Corn	GroupA-0786	2.67	0.03	2.26	0.02	30895.46	24.38	862	1099	-237	RF
BS	CF	2017	Corn	GroupA-0787	3.29	0.05	2.78	0.02	3076.95	30.10	757	1099	-342	RF
6	CF	2018	Corn	GroupA-0788	2.33	0.00	1.83	0.01	1790.97	31.36	244	1098	-854	RF
AM	CF	2018	Corn	GroupA-0789	2.37	0.01	1.85	0.06	2925.31	31.80	1727	1098	629	RF
HB	CF	2018	Corn	GroupA-0790	3.32	0.00	2.74	0.01	1609.48	44.64	363	1098	-735	RF
NH	CF	2018	Corn	GroupA-0791	4.49	0.02	4.07	0.01	4061.52	60.38	222	1098	-876	RF
PL	CF	2018	Corn	GroupA-0792	2.21	0.01	1.74	0.03	1531.30	29.69	974	1098	-124	RF
PLB	CF	2018	Corn	GroupA-0793	2.44	0.00	1.95	0.01	1177.89	32.83	506	1098	-592	RF
BG	CF	2018	Corn	GroupA-0794	2.29	0.00	1.85	0.05	3976.07	30.82	1421	1098	323	RF
BBEA	CF	2018	Corn	GroupA-0795	2.12	0.00	1.68	0.11	4282.54	28.44	3047	1098	1949	RF
JL	CF	2018	Corn	GroupA-0796	2.73	0.05	2.25	0.02	30895.46	36.66	901	1098	-197	RF
AM	CF	2020	Corn	GroupA-0797	1.53	0.03	1.19	0.02	2925.31	18.19	742	1095	-353	RF
PB	CF	2020	Corn	GroupA-0798	1.45	0.12	1.14	0.01	1477.63	17.20	333	1095	-762	RF
PE	CF	2020	Corn	GroupA-0799	3.29	0.04	2.96	0.03	1470.34	39.14	942	1095	-153	RF
PW	CF	2020	Corn	GroupA-0800	2.59	0.03	2.26	0.01	1380.51	30.80	260	1095	-835	RF
PL	CF	2020	Corn	GroupA-0801	1.98	0.07	1.64	0.03	1531.30	23.54	976	1095	-119	RF
PLB	CF	2020	Corn	GroupA-0802	1.91	0.00	1.52	0.02	1177.89	22.68	498	1095	-597	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
JL	CF	2020	Corn	GroupA-0803	2.37	0.14	1.97	0.02	30895.46	28.20	889	1095	-206	RF
6	HB	2016	Corn	GroupA-0804	1.00	0.02	0.80	0.01	593.20	10.97	249	366	-117	RF
AM	HB	2016	Corn	GroupA-0805	1.12	0.00	0.96	0.06	1351.32	12.24	1759	366	1393	RF
NH	HB	2016	Corn	GroupA-0806	1.90	0.01	1.71	0.01	2580.18	20.71	222	366	-144	RF
PL	HB	2016	Corn	GroupA-0807	0.98	0.00	0.75	0.03	1056.49	10.73	978	366	612	RF
PLB	HB	2016	Corn	GroupA-0808	1.23	0.00	0.99	0.02	1650.52	13.42	501	366	135	RF
BG	HB	2016	Corn	GroupA-0809	1.17	0.00	0.95	0.05	4415.29	12.77	1426	366	1060	RF
BBEA	HB	2016	Corn	GroupA-0810	1.61	0.00	1.42	0.12	4811.25	17.58	3066	366	2700	RF
6	HB	2017	Corn	GroupA-0811	3.73	0.12	2.97	0.01	593.20	39.60	248	557	-309	RF
AM	HB	2017	Corn	GroupA-0812	3.67	0.00	2.85	0.06	1351.32	38.92	1746	557	1189	RF
CF	HB	2017	Corn	GroupA-0813	3.83	0.14	2.93	0.04	1609.48	40.67	1099	557	542	RF
NH	HB	2017	Corn	GroupA-0814	3.51	0.00	2.90	0.01	2580.18	37.22	226	557	-331	RF
PB	HB	2017	Corn	GroupA-0815	3.98	0.25	3.07	0.01	2853.21	42.24	338	557	-219	RF
PTB	HB	2017	Corn	GroupA-0816	5.14	0.01	4.41	0.01	1152.69	54.55	296	557	-261	RF
PL	HB	2017	Corn	GroupA-0817	3.48	0.00	2.79	0.03	1056.49	36.94	979	557	422	RF
PLB	HB	2017	Corn	GroupA-0818	3.27	0.04	2.67	0.02	1650.52	34.72	508	557	-49	RF
BG	HB	2017	Corn	GroupA-0819	3.31	0.06	2.64	0.05	4415.29	35.10	1426	557	869	RF
BBEA	HB	2017	Corn	GroupA-0820	3.45	0.11	2.57	0.11	4811.25	36.54	2889	557	2332	RF
JL	HB	2017	Corn	GroupA-0821	3.52	0.09	2.69	0.02	30527.42	37.37	862	557	305	RF
BS	HB	2017	Corn	GroupA-0822	3.58	0.02	3.05	0.02	3100.07	37.92	757	557	200	RF
6	HB	2018	Corn	GroupA-0823	3.86	0.04	3.45	0.01	593.20	67.88	244	363	-119	RF
AM	HB	2018	Corn	GroupA-0824	2.91	0.06	2.50	0.06	1351.32	51.19	1727	363	1364	RF
CF	HB	2018	Corn	GroupA-0825	4.35	0.07	3.77	0.03	1609.48	76.49	1098	363	735	RF
NH	HB	2018	Corn	GroupA-0826	2.58	0.07	2.11	0.01	2580.18	45.29	222	363	-141	RF
PL	HB	2018	Corn	GroupA-0827	3.15	0.17	2.69	0.03	1056.49	55.45	974	363	611	RF
PLB	HB	2018	Corn	GroupA-0828	3.01	0.00	2.59	0.01	1650.52	52.92	506	363	143	RF
BG	HB	2018	Corn	GroupA-0829	3.62	0.24	3.13	0.05	4415.29	63.71	1421	363	1058	RF
BBEA	HB	2018	Corn	GroupA-0830	3.57	0.07	3.07	0.12	4811.25	62.82	3047	363	2684	RF
JL	HB	2018	Corn	GroupA-0831	2.70	0.10	2.20	0.02	30527.42	47.46	901	363	538	RF
6	HB	2019	Corn	GroupA-0832	2.02	0.17	1.60	0.01	593.20	33.14	246	365	-119	RF
AM	HB	2019	Corn	GroupA-0833	2.10	0.11	1.67	0.03	1351.32	34.39	992	365	627	RF
NH	HB	2019	Corn	GroupA-0834	2.33	0.26	1.90	0.01	2580.18	38.15	215	365	-150	RF
BG	HB	2019	Corn	GroupA-0835	2.75	0.00	2.24	0.05	4415.29	44.97	1428	365	1063	RF
BBEA	HB	2019	Corn	GroupA-0836	2.46	0.02	1.96	0.12	4811.25	40.28	3067	365	2702	RF
BS	HB	2019	Corn	GroupA-0837	4.03	0.02	3.60	0.02	3100.07	66.02	749	365	384	RF
CF	NH	2014	Corn	GroupA-0838	1.47	0.02	1.16	0.03	4061.52	14.10	1086	223	863	RF
AM	NH	2015	Corn	GroupA-0839	0.85	0.03	0.65	0.01	1283.59	12.14	276	221	55	RF
PL	NH	2015	Corn	GroupA-0840	0.94	0.04	0.71	0.00	2690.61	13.49	55	221	-166	RF
6	NH	2016	Corn	GroupA-0841	1.40	0.22	1.19	0.01	2271.12	18.31	249	222	27	RF
AM	NH	2016	Corn	GroupA-0842	1.14	0.02	0.92	0.06	1283.59	14.84	1759	222	1537	RF
HB	NH	2016	Corn	GroupA-0843	1.81	0.04	1.63	0.01	2580.18	23.61	366	222	144	RF
PL	NH	2016	Corn	GroupA-0844	1.06	0.07	0.85	0.03	2690.61	13.76	978	222	756	RF
PLB	NH	2016	Corn	GroupA-0845	0.92	0.09	0.70	0.01	3474.91	11.94	501	222	279	RF
BG	NH	2016	Corn	GroupA-0846	1.39	0.12	1.20	0.04	4995.12	18.08	1426	222	1204	RF
BBEA	NH	2016	Corn	GroupA-0847	0.92	0.01	0.74	0.10	5431.98	12.06	3066	222	2844	RF
6	NH	2017	Corn	GroupA-0848	2.45	0.00	1.74	0.01	2271.12	23.69	248	226	22	RF
AM	NH	2017	Corn	GroupA-0849	2.82	0.01	2.27	0.06	1283.59	27.25	1746	226	1520	RF
CF	NH	2017	Corn	GroupA-0850	2.08	0.03	1.53	0.03	4061.52	20.14	1099	226	873	RF
HB	NH	2017	Corn	GroupA-0851	3.25	0.00	2.86	0.01	2580.18	31.47	557	226	331	RF
PB	NH	2017	Corn	GroupA-0852	2.48	0.01	1.82	0.01	4911.94	23.97	338	226	112	RF
PTB	NH	2017	Corn	GroupA-0853	5.49	0.12	5.22	0.01	3164.44	53.11	296	226	70	RF
PL	NH	2017	Corn	GroupA-0854	2.12	0.02	1.76	0.03	2690.61	20.51	979	226	753	RF
PLB	NH	2017	Corn	GroupA-0855	2.18	0.01	1.86	0.01	3474.91	21.04	508	226	282	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BG	NH	2017	Corn	GroupA-0856	1.97	0.00	1.54	0.04	4995.12	19.05	1426	226	1200	RF
BBEA	NH	2017	Corn	GroupA-0857	2.10	0.00	1.53	0.09	5431.98	20.29	2889	226	2663	RF
JL	NH	2017	Corn	GroupA-0858	2.94	0.00	2.28	0.02	31398.77	28.46	862	226	636	RF
BS	NH	2017	Corn	GroupA-0859	2.65	0.14	2.29	0.02	5253.94	25.61	757	226	531	RF
6	NH	2018	Corn	GroupA-0860	2.16	0.00	1.62	0.01	2271.12	34.41	244	222	22	RF
AM	NH	2018	Corn	GroupA-0861	2.87	0.07	2.40	0.06	1283.59	45.70	1727	222	1505	RF
CF	NH	2018	Corn	GroupA-0862	4.02	0.02	3.49	0.03	4061.52	64.07	1098	222	876	RF
HB	NH	2018	Corn	GroupA-0863	2.25	0.04	1.89	0.01	2580.18	35.87	363	222	141	RF
PL	NH	2018	Corn	GroupA-0864	2.24	0.03	1.81	0.03	2690.61	35.70	974	222	752	RF
PLB	NH	2018	Corn	GroupA-0865	2.13	0.00	1.79	0.01	3474.91	34.02	506	222	284	RF
BG	NH	2018	Corn	GroupA-0866	3.53	0.00	2.92	0.04	4995.12	56.22	1421	222	1199	RF
BBEA	NH	2018	Corn	GroupA-0867	2.64	0.01	2.04	0.10	5431.98	42.16	3047	222	2825	RF
JL	NH	2018	Corn	GroupA-0868	2.93	0.04	2.34	0.02	31398.77	46.67	901	222	679	RF
6	NH	2019	Corn	GroupA-0869	1.85	0.00	1.53	0.01	2271.12	24.67	246	215	31	RF
AM	NH	2019	Corn	GroupA-0870	2.17	0.07	1.95	0.03	1283.59	28.90	992	215	777	RF
HB	NH	2019	Corn	GroupA-0871	1.80	0.14	1.42	0.01	2580.18	24.01	365	215	150	RF
BG	NH	2019	Corn	GroupA-0872	1.78	0.10	1.24	0.04	4995.12	23.72	1428	215	1213	RF
BBEA	NH	2019	Corn	GroupA-0873	1.78	0.01	1.42	0.10	5431.98	23.64	3067	215	2852	RF
BS	NH	2019	Corn	GroupA-0874	2.01	0.18	1.49	0.02	5253.94	26.77	749	215	534	RF
CF	PB	2013	Corn	GroupA-0875	3.07	0.04	2.41	0.03	1477.63	27.95	1093	327	766	RF
PL	PB	2013	Corn	GroupA-0876	2.50	0.11	1.94	0.03	2233.71	22.74	972	327	645	RF
PLB	PB	2013	Corn	GroupA-0877	2.86	0.07	2.25	0.01	1437.03	26.02	503	327	176	RF
6	PB	2017	Corn	GroupA-0878	3.33	0.00	2.96	0.01	2775.62	25.50	248	338	-90	RF
AM	PB	2017	Corn	GroupA-0879	3.12	0.03	2.77	0.05	3991.90	23.90	1746	338	1408	RF
CF	PB	2017	Corn	GroupA-0880	2.24	0.01	1.91	0.03	1477.63	17.17	1099	338	761	RF
HB	PB	2017	Corn	GroupA-0881	4.63	0.06	4.11	0.01	2853.21	35.45	557	338	219	RF
NH	PB	2017	Corn	GroupA-0882	4.65	0.03	4.26	0.00	4911.94	35.64	226	338	-112	RF
PTB	PB	2017	Corn	GroupA-0883	9.67	0.06	9.38	0.01	3582.30	74.11	296	338	-42	RF
PL	PB	2017	Corn	GroupA-0884	3.55	0.08	3.17	0.02	2233.71	27.16	979	338	641	RF
PLB	PB	2017	Corn	GroupA-0885	3.90	0.00	3.49	0.01	1437.03	29.86	508	338	170	RF
BG	PB	2017	Corn	GroupA-0886	6.27	0.04	5.89	0.04	3001.92	48.01	1426	338	1088	RF
BBEA	PB	2017	Corn	GroupA-0887	5.98	0.01	5.38	0.08	3203.03	45.85	2889	338	2551	RF
JL	PB	2017	Corn	GroupA-0888	3.68	0.00	3.31	0.02	32178.80	28.17	862	338	524	RF
BS	PB	2017	Corn	GroupA-0889	5.63	0.01	5.25	0.02	4411.96	43.10	757	338	419	RF
AM	PB	2020	Corn	GroupA-0890	2.91	0.05	2.51	0.02	3991.90	26.57	742	333	409	RF
CF	PB	2020	Corn	GroupA-0891	2.05	0.01	1.73	0.03	1477.63	18.74	1095	333	762	RF
PE	PB	2020	Corn	GroupA-0892	2.22	0.05	1.77	0.03	573.60	20.28	942	333	609	RF
PW	PB	2020	Corn	GroupA-0893	2.31	0.08	1.97	0.01	1133.42	21.13	260	333	-73	RF
PL	PB	2020	Corn	GroupA-0894	2.50	0.00	2.10	0.02	2233.71	22.87	976	333	643	RF
PLB	PB	2020	Corn	GroupA-0895	2.65	0.00	2.25	0.01	1437.03	24.18	498	333	165	RF
JL	PB	2020	Corn	GroupA-0896	2.45	0.03	2.06	0.02	32178.80	22.37	889	333	556	RF
AM	PE	2020	Corn	GroupA-0897	3.79	0.05	3.53	0.02	4256.93	32.58	742	942	-200	RF
CF	PE	2020	Corn	GroupA-0898	3.23	0.00	2.82	0.03	1470.34	27.72	1095	942	153	RF
PB	PE	2020	Corn	GroupA-0899	2.76	0.01	2.39	0.01	573.60	23.69	333	942	-609	RF
PW	PE	2020	Corn	GroupA-0900	1.89	0.00	1.57	0.01	602.45	16.22	260	942	-682	RF
PL	PE	2020	Corn	GroupA-0901	2.62	0.00	2.24	0.02	2576.96	22.47	976	942	34	RF
PLB	PE	2020	Corn	GroupA-0902	2.85	0.01	2.49	0.01	1832.05	24.45	498	942	-444	RF
JL	PE	2020	Corn	GroupA-0903	2.21	0.02	1.85	0.02	31805.51	18.99	889	942	-53	RF
AM	PW	2020	Corn	GroupA-0904	2.95	0.01	2.62	0.02	4299.79	28.49	742	260	482	RF
CF	PW	2020	Corn	GroupA-0905	2.58	0.05	2.31	0.03	1380.51	24.86	1095	260	835	RF
PB	PW	2020	Corn	GroupA-0906	2.10	0.01	1.73	0.01	1133.42	20.24	333	260	73	RF
PE	PW	2020	Corn	GroupA-0907	2.04	0.00	1.62	0.03	602.45	19.66	942	260	682	RF
PL	PW	2020	Corn	GroupA-0908	1.72	0.04	1.42	0.03	2757.07	16.58	976	260	716	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PLB	PW	2020	Corn	GroupA-0909	2.06	0.01	1.77	0.01	2110.84	19.84	498	260	238	RF
JL	PW	2020	Corn	GroupA-0910	1.54	0.10	1.30	0.02	31235.93	14.89	889	260	629	RF
AM	PTB	2017	Corn	GroupA-0912	5.11	0.10	4.68	0.06	1901.85	85.89	1746	296	1450	RF
HB	PTB	2017	Corn	GroupA-0914	3.93	0.00	3.30	0.01	1152.69	66.07	557	296	261	RF
NH	PTB	2017	Corn	GroupA-0915	3.83	0.18	3.10	0.00	3164.44	64.47	226	296	-70	RF
PL	PTB	2017	Corn	GroupA-0917	5.17	0.02	4.69	0.03	2192.01	86.88	979	296	683	RF
PLB	PTB	2017	Corn	GroupA-0918	5.56	0.36	4.69	0.02	2652.61	93.54	508	296	212	RF
BG	PTB	2017	Corn	GroupA-0919	3.53	0.29	3.06	0.05	5528.32	59.32	1426	296	1130	RF
BBEA	PTB	2017	Corn	GroupA-0920	4.32	0.32	3.93	0.11	5911.78	72.63	2889	296	2593	RF
JL	PTB	2017	Corn	GroupA-0921	4.82	0.12	4.36	0.02	29375.83	81.02	862	296	566	RF
BS	PTB	2017	Corn	GroupA-0922	2.74	0.00	2.11	0.02	2114.72	46.04	757	296	461	RF
CF	PL	2013	Corn	GroupA-0923	1.87	0.01	1.61	0.03	1531.30	18.45	1093	972	121	RF
PB	PL	2013	Corn	GroupA-0924	1.54	0.00	1.30	0.01	2233.71	15.18	327	972	-645	RF
PLB	PL	2013	Corn	GroupA-0925	1.45	0.01	1.15	0.02	809.82	14.32	503	972	-469	RF
AM	PL	2015	Corn	GroupA-0926	1.77	0.00	1.49	0.01	1797.09	22.21	276	55	221	RF
NH	PL	2015	Corn	GroupA-0927	1.32	0.01	1.03	0.01	2690.61	16.53	221	55	166	RF
6	PL	2016	Corn	GroupA-0928	1.04	0.00	0.82	0.01	632.74	11.83	249	978	-729	RF
AM	PL	2016	Corn	GroupA-0929	1.04	0.02	0.81	0.06	1797.09	11.80	1759	978	781	RF
HB	PL	2016	Corn	GroupA-0930	1.12	0.00	0.86	0.01	1056.49	12.76	366	978	-612	RF
NH	PL	2016	Corn	GroupA-0931	1.68	0.01	1.47	0.01	2690.61	19.10	222	978	-756	RF
PLB	PL	2016	Corn	GroupA-0932	1.08	0.00	0.85	0.01	809.82	12.25	501	978	-477	RF
BG	PL	2016	Corn	GroupA-0933	1.16	0.01	0.92	0.05	3360.23	13.24	1426	978	448	RF
BBEA	PL	2016	Corn	GroupA-0934	1.42	0.00	1.15	0.12	3759.77	16.15	3066	978	2088	RF
6	PL	2017	Corn	GroupA-0935	2.53	0.00	2.11	0.01	632.74	24.37	248	979	-731	RF
AM	PL	2017	Corn	GroupA-0936	2.17	0.00	1.74	0.06	1797.09	20.83	1746	979	767	RF
CF	PL	2017	Corn	GroupA-0937	2.04	0.01	1.54	0.03	1531.30	19.60	1099	979	120	RF
HB	PL	2017	Corn	GroupA-0938	3.13	0.04	2.40	0.02	1056.49	30.11	557	979	-422	RF
NH	PL	2017	Corn	GroupA-0939	2.61	0.00	2.15	0.01	2690.61	25.06	226	979	-753	RF
PB	PL	2017	Corn	GroupA-0940	2.20	0.00	1.72	0.01	2233.71	21.11	338	979	-641	RF
PTB	PL	2017	Corn	GroupA-0941	5.29	0.03	4.99	0.01	2192.01	50.89	296	979	-683	RF
PLB	PL	2017	Corn	GroupA-0942	2.16	0.01	1.74	0.02	809.82	20.79	508	979	-471	RF
BG	PL	2017	Corn	GroupA-0943	2.14	0.04	1.66	0.05	3360.23	20.54	1426	979	447	RF
BBEA	PL	2017	Corn	GroupA-0944	2.12	0.01	1.62	0.11	3759.77	20.43	2889	979	1910	RF
JL	PL	2017	Corn	GroupA-0945	2.73	0.04	2.17	0.02	31562.14	26.21	862	979	-117	RF
BS	PL	2017	Corn	GroupA-0946	2.84	0.03	2.31	0.02	3972.53	27.30	757	979	-222	RF
6	PL	2018	Corn	GroupA-0947	2.46	0.00	1.97	0.01	632.74	36.19	244	974	-730	RF
AM	PL	2018	Corn	GroupA-0948	2.29	0.01	1.88	0.05	1797.09	33.70	1727	974	753	RF
CF	PL	2018	Corn	GroupA-0949	2.75	0.02	2.19	0.03	1531.30	40.38	1098	974	124	RF
HB	PL	2018	Corn	GroupA-0950	2.91	0.00	2.43	0.01	1056.49	42.77	363	974	-611	RF
NH	PL	2018	Corn	GroupA-0951	3.30	0.03	2.82	0.01	2690.61	48.53	222	974	-752	RF
PLB	PL	2018	Corn	GroupA-0952	2.45	0.00	2.03	0.02	809.82	35.92	506	974	-468	RF
BG	PL	2018	Corn	GroupA-0953	2.50	0.01	1.97	0.05	3360.23	36.68	1421	974	447	RF
BBEA	PL	2018	Corn	GroupA-0954	2.20	0.02	1.79	0.11	3759.77	32.32	3047	974	2073	RF
JL	PL	2018	Corn	GroupA-0955	2.39	0.00	1.95	0.02	31562.14	35.12	901	974	-73	RF
AM	PL	2020	Corn	GroupA-0956	1.98	0.04	1.60	0.02	1797.09	21.61	742	976	-234	RF
CF	PL	2020	Corn	GroupA-0957	1.88	0.07	1.41	0.03	1531.30	20.44	1095	976	119	RF
PB	PL	2020	Corn	GroupA-0958	1.76	0.00	1.40	0.01	2233.71	19.13	333	976	-643	RF
PE	PL	2020	Corn	GroupA-0959	2.86	0.04	2.50	0.03	2576.96	31.20	942	976	-34	RF
PW	PL	2020	Corn	GroupA-0960	1.96	0.00	1.57	0.01	2757.07	21.34	260	976	-716	RF
PLB	PL	2020	Corn	GroupA-0961	1.73	0.00	1.40	0.02	809.82	18.84	498	976	-478	RF
JL	PL	2020	Corn	GroupA-0962	1.89	0.02	1.45	0.02	31562.14	20.56	889	976	-87	RF
CF	PLB	2013	Corn	GroupA-0963	1.56	0.00	1.28	0.03	1177.89	15.87	1093	503	590	RF
PB	PLB	2013	Corn	GroupA-0964	1.41	0.00	1.13	0.01	1437.03	14.28	327	503	-176	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PL	PLB	2013	Corn	GroupA-0965	1.33	0.01	0.97	0.03	809.82	13.49	972	503	469	RF
6	PLB	2016	Corn	GroupA-0966	1.29	0.00	1.01	0.01	1403.96	15.48	249	501	-252	RF
AM	PLB	2016	Corn	GroupA-0967	1.07	0.08	0.85	0.06	2601.80	12.91	1759	501	1258	RF
HB	PLB	2016	Corn	GroupA-0968	1.61	0.05	1.29	0.01	1650.52	19.43	366	501	-135	RF
NH	PLB	2016	Corn	GroupA-0969	1.43	0.00	1.21	0.01	3474.91	17.20	222	501	-279	RF
PL	PLB	2016	Corn	GroupA-0970	1.00	0.24	0.73	0.03	809.82	12.05	978	501	477	RF
BG	PLB	2016	Corn	GroupA-0971	1.37	0.03	1.07	0.05	2941.78	16.50	1426	501	925	RF
BBEA	PLB	2016	Corn	GroupA-0972	1.21	0.16	0.95	0.12	3296.50	14.61	3066	501	2565	RF
6	PLB	2017	Corn	GroupA-0973	3.24	0.00	2.77	0.01	1403.96	33.80	248	508	-260	RF
AM	PLB	2017	Corn	GroupA-0974	2.60	0.01	2.17	0.06	2601.80	27.14	1746	508	1238	RF
CF	PLB	2017	Corn	GroupA-0975	2.38	0.08	1.86	0.03	1177.89	24.85	1099	508	591	RF
HB	PLB	2017	Corn	GroupA-0976	3.28	0.01	2.65	0.02	1650.52	34.24	557	508	49	RF
NH	PLB	2017	Corn	GroupA-0977	2.57	0.01	2.00	0.00	3474.91	26.87	226	508	-282	RF
PB	PLB	2017	Corn	GroupA-0978	2.88	0.00	2.35	0.01	1437.03	30.05	338	508	-170	RF
PTB	PLB	2017	Corn	GroupA-0979	4.79	0.02	4.35	0.01	2652.61	50.01	296	508	-212	RF
PL	PLB	2017	Corn	GroupA-0980	2.18	0.02	1.68	0.03	809.82	22.81	979	508	471	RF
BG	PLB	2017	Corn	GroupA-0981	2.20	0.00	1.71	0.05	2941.78	22.96	1426	508	918	RF
BBEA	PLB	2017	Corn	GroupA-0982	2.57	0.01	2.09	0.11	3296.50	26.84	2889	508	2381	RF
JL	PLB	2017	Corn	GroupA-0983	4.24	0.07	3.63	0.02	31878.96	44.25	862	508	354	RF
BS	PLB	2017	Corn	GroupA-0984	2.65	0.02	2.13	0.02	4109.93	27.68	757	508	249	RF
6	PLB	2018	Corn	GroupA-0985	2.83	0.00	2.32	0.01	1403.96	50.55	244	506	-262	RF
AM	PLB	2018	Corn	GroupA-0986	2.71	0.03	2.20	0.05	2601.80	48.41	1727	506	1221	RF
CF	PLB	2018	Corn	GroupA-0987	2.72	0.00	2.23	0.03	1177.89	48.57	1098	506	592	RF
HB	PLB	2018	Corn	GroupA-0988	2.67	0.01	2.24	0.01	1650.52	47.68	363	506	-143	RF
NH	PLB	2018	Corn	GroupA-0989	3.17	0.03	2.58	0.00	3474.91	56.62	222	506	-284	RF
PL	PLB	2018	Corn	GroupA-0990	2.68	0.01	2.15	0.03	809.82	47.89	974	506	468	RF
BG	PLB	2018	Corn	GroupA-0991	3.54	0.01	2.87	0.05	2941.78	63.07	1421	506	915	RF
BBEA	PLB	2018	Corn	GroupA-0992	2.85	0.06	2.29	0.11	3296.50	50.81	3047	506	2541	RF
JL	PLB	2018	Corn	GroupA-0993	3.81	0.04	3.04	0.02	31878.96	67.94	901	506	395	RF
AM	PLB	2020	Corn	GroupA-0994	2.02	0.10	1.61	0.02	2601.80	21.74	742	498	244	RF
CF	PLB	2020	Corn	GroupA-0995	2.04	0.00	1.46	0.03	1177.89	22.02	1095	498	597	RF
PB	PLB	2020	Corn	GroupA-0996	1.85	0.00	1.40	0.01	1437.03	19.95	333	498	-165	RF
PE	PLB	2020	Corn	GroupA-0997	2.86	0.01	2.47	0.02	1832.05	30.78	942	498	444	RF
PW	PLB	2020	Corn	GroupA-0998	2.16	0.01	1.77	0.01	2110.84	23.25	260	498	-238	RF
PL	PLB	2020	Corn	GroupA-0999	1.86	0.01	1.51	0.03	809.82	20.08	976	498	478	RF
JL	PLB	2020	Corn	GroupA-1000	2.23	0.04	1.80	0.02	31878.96	24.06	889	498	391	RF
6	BG	2016	Corn	GroupA-1001	1.68	0.01	1.28	0.01	3938.74	19.52	249	1426	-1177	RF
AM	BG	2016	Corn	GroupA-1002	1.77	0.02	1.40	0.05	4801.99	20.57	1759	1426	333	RF
HB	BG	2016	Corn	GroupA-1003	1.73	0.02	1.25	0.01	4415.29	20.04	366	1426	-1060	RF
NH	BG	2016	Corn	GroupA-1004	2.16	0.01	1.92	0.00	4995.12	25.02	222	1426	-1204	RF
PL	BG	2016	Corn	GroupA-1005	1.72	0.01	1.35	0.02	3360.23	19.92	978	1426	-448	RF
PLB	BG	2016	Corn	GroupA-1006	1.70	0.01	1.32	0.01	2941.78	19.65	501	1426	-925	RF
BBEA	BG	2016	Corn	GroupA-1007	1.82	0.06	1.49	0.12	438.12	21.15	3066	1426	1640	RF
6	BG	2017	Corn	GroupA-1008	3.51	0.01	2.88	0.01	3938.74	37.40	248	1426	-1178	RF
AM	BG	2017	Corn	GroupA-1009	3.13	0.01	2.47	0.05	4801.99	33.37	1746	1426	320	RF
CF	BG	2017	Corn	GroupA-1010	3.41	0.11	2.62	0.03	3976.07	36.41	1099	1426	-327	RF
HB	BG	2017	Corn	GroupA-1011	3.12	0.08	2.48	0.01	4415.29	33.33	557	1426	-869	RF
NH	BG	2017	Corn	GroupA-1012	3.12	0.00	2.50	0.00	4995.12	33.27	226	1426	-1200	RF
PB	BG	2017	Corn	GroupA-1013	3.72	0.21	2.76	0.01	3001.92	39.68	338	1426	-1088	RF
PTB	BG	2017	Corn	GroupA-1014	4.46	0.07	3.87	0.01	5528.32	47.59	296	1426	-1130	RF
PL	BG	2017	Corn	GroupA-1015	3.08	0.07	2.37	0.02	3360.23	32.82	979	1426	-447	RF
PLB	BG	2017	Corn	GroupA-1016	2.96	0.02	2.18	0.01	2941.78	31.60	508	1426	-918	RF
BBEA	BG	2017	Corn	GroupA-1017	2.26	0.34	1.77	0.11	438.12	24.13	2889	1426	1463	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
JL	BG	2017	Corn	GroupA-1018	3.35	0.09	2.73	0.02	34820.43	35.75	862	1426	-564	RF
BS	BG	2017	Corn	GroupA-1019	2.89	0.03	2.30	0.02	7029.70	30.85	757	1426	-669	RF
6	BG	2018	Corn	GroupA-1020	2.84	0.04	2.30	0.01	3938.74	36.76	244	1421	-1177	RF
AM	BG	2018	Corn	GroupA-1021	2.91	0.01	2.36	0.05	4801.99	37.68	1727	1421	306	RF
CF	BG	2018	Corn	GroupA-1022	2.61	0.08	2.10	0.03	3976.07	33.79	1098	1421	-323	RF
HB	BG	2018	Corn	GroupA-1023	3.54	0.12	2.97	0.01	4415.29	45.85	363	1421	-1058	RF
NH	BG	2018	Corn	GroupA-1024	4.69	0.03	4.13	0.00	4995.12	60.68	222	1421	-1199	RF
PL	BG	2018	Corn	GroupA-1025	3.11	0.00	2.57	0.02	3360.23	40.20	974	1421	-447	RF
PLB	BG	2018	Corn	GroupA-1026	3.12	0.09	2.64	0.01	2941.78	40.36	506	1421	-915	RF
BBEA	BG	2018	Corn	GroupA-1027	2.32	0.28	1.85	0.11	438.12	29.98	3047	1421	1626	RF
JL	BG	2018	Corn	GroupA-1028	2.76	0.02	2.19	0.02	34820.43	35.74	901	1421	-520	RF
6	BG	2019	Corn	GroupA-1029	2.46	0.02	2.05	0.01	3938.74	32.84	246	1428	-1182	RF
AM	BG	2019	Corn	GroupA-1030	2.77	0.00	2.39	0.02	4801.99	36.96	992	1428	-436	RF
HB	BG	2019	Corn	GroupA-1031	3.17	0.00	2.58	0.01	4415.29	42.38	365	1428	-1063	RF
NH	BG	2019	Corn	GroupA-1032	2.79	0.03	2.34	0.00	4995.12	37.24	215	1428	-1213	RF
BBEA	BG	2019	Corn	GroupA-1033	2.26	0.06	1.76	0.12	438.12	30.13	3067	1428	1639	RF
BS	BG	2019	Corn	GroupA-1034	2.59	0.01	2.06	0.02	7029.70	34.61	749	1428	-679	RF
BBEA	BG	2021	Corn	GroupA-1035	2.14	0.20	1.76	0.12	438.12	20.64	3029	1430	1599	RF
BS	BG	2021	Corn	GroupA-1036	5.26	0.08	4.86	0.01	7029.70	50.61	645	1430	-785	RF
6	BBEA	2016	Corn	GroupA-1037	1.86	0.03	1.36	0.01	4348.89	22.96	249	3066	-2817	RF
AM	BBEA	2016	Corn	GroupA-1038	1.86	0.05	1.37	0.04	5233.55	22.98	1759	3066	-1307	RF
HB	BBEA	2016	Corn	GroupA-1039	2.22	0.04	1.64	0.01	4811.25	27.51	366	3066	-2700	RF
NH	BBEA	2016	Corn	GroupA-1040	2.09	0.00	1.74	0.00	5431.98	25.89	222	3066	-2844	RF
PL	BBEA	2016	Corn	GroupA-1041	2.00	0.00	1.53	0.02	3759.77	24.73	978	3066	-2088	RF
PLB	BBEA	2016	Corn	GroupA-1042	1.90	0.02	1.39	0.01	3296.50	23.52	501	3066	-2565	RF
BG	BBEA	2016	Corn	GroupA-1043	1.84	0.03	1.38	0.03	438.12	22.81	1426	3066	-1640	RF
6	BBEA	2017	Corn	GroupA-1044	2.97	0.04	2.35	0.01	4348.89	27.80	248	2889	-2641	RF
AM	BBEA	2017	Corn	GroupA-1045	2.67	0.02	2.07	0.04	5233.55	25.02	1746	2889	-1143	RF
CF	BBEA	2017	Corn	GroupA-1046	2.98	0.11	2.29	0.02	4282.54	27.90	1099	2889	-1790	RF
HB	BBEA	2017	Corn	GroupA-1047	3.87	0.02	3.12	0.01	4811.25	36.25	557	2889	-2332	RF
NH	BBEA	2017	Corn	GroupA-1048	3.46	0.00	2.89	0.00	5431.98	32.42	226	2889	-2663	RF
PB	BBEA	2017	Corn	GroupA-1049	3.13	0.16	2.37	0.01	3203.03	29.32	338	2889	-2551	RF
PTB	BBEA	2017	Corn	GroupA-1050	5.76	0.03	5.23	0.01	5911.78	54.01	296	2889	-2593	RF
PL	BBEA	2017	Corn	GroupA-1051	3.07	0.13	2.51	0.02	3759.77	28.80	979	2889	-1910	RF
PLB	BBEA	2017	Corn	GroupA-1052	3.00	0.02	2.44	0.01	3296.50	28.15	508	2889	-2381	RF
BG	BBEA	2017	Corn	GroupA-1053	2.51	0.25	1.99	0.03	438.12	23.51	1426	2889	-1463	RF
JL	BBEA	2017	Corn	GroupA-1054	2.77	0.10	2.12	0.02	35161.19	26.01	862	2889	-2027	RF
BS	BBEA	2017	Corn	GroupA-1055	3.11	0.09	2.58	0.02	7352.54	29.15	757	2889	-2132	RF
6	BBEA	2018	Corn	GroupA-1056	3.07	0.01	2.53	0.01	4348.89	39.48	244	3047	-2803	RF
AM	BBEA	2018	Corn	GroupA-1057	3.00	0.01	2.41	0.04	5233.55	38.61	1727	3047	-1320	RF
CF	BBEA	2018	Corn	GroupA-1058	2.76	0.08	2.15	0.02	4282.54	35.50	1098	3047	-1949	RF
HB	BBEA	2018	Corn	GroupA-1059	3.27	0.11	2.66	0.01	4811.25	42.10	363	3047	-2684	RF
NH	BBEA	2018	Corn	GroupA-1060	4.22	0.10	3.67	0.00	5431.98	54.30	222	3047	-2825	RF
PL	BBEA	2018	Corn	GroupA-1061	3.16	0.00	2.61	0.02	3759.77	40.71	974	3047	-2073	RF
PLB	BBEA	2018	Corn	GroupA-1062	3.03	0.11	2.51	0.01	3296.50	39.03	506	3047	-2541	RF
BG	BBEA	2018	Corn	GroupA-1063	2.56	0.19	1.96	0.03	438.12	32.94	1421	3047	-1626	RF
JL	BBEA	2018	Corn	GroupA-1064	2.91	0.01	2.30	0.02	35161.19	37.53	901	3047	-2146	RF
6	BBEA	2019	Corn	GroupA-1065	2.20	0.01	1.76	0.01	4348.89	30.48	246	3067	-2821	RF
AM	BBEA	2019	Corn	GroupA-1066	2.47	0.00	2.06	0.02	5233.55	34.31	992	3067	-2075	RF
HB	BBEA	2019	Corn	GroupA-1067	2.68	0.00	2.08	0.01	4811.25	37.23	365	3067	-2702	RF
NH	BBEA	2019	Corn	GroupA-1068	2.31	0.03	1.87	0.00	5431.98	32.10	215	3067	-2852	RF
BG	BBEA	2019	Corn	GroupA-1069	2.06	0.04	1.59	0.03	438.12	28.52	1428	3067	-1639	RF
BS	BBEA	2019	Corn	GroupA-1070	2.48	0.01	1.95	0.02	7352.54	34.37	749	3067	-2318	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BG	BBEA	2021	Corn	GroupA-1071	2.60	0.16	1.93	0.03	438.12	27.25	1430	3029	-1599	RF
BS	BBEA	2021	Corn	GroupA-1072	4.46	0.00	3.89	0.01	7352.54	46.80	645	3029	-2384	RF
CS	AA	2015	Corn	GroupA-1073	3.58	0.10	3.17	0.06	1521.14	30.55	2451	3961	-1510	RF
RD	AA	2015	Corn	GroupA-1074	4.12	0.04	3.77	0.03	28035.93	35.15	1261	3961	-2700	RF
CS	AA	2016	Corn	GroupA-1075	2.15	0.21	1.71	0.06	1521.14	22.05	2440	3973	-1533	RF
SP	AA	2016	Corn	GroupA-1076	2.13	0.23	1.74	0.05	3305.23	21.86	1988	3973	-1985	RF
CS	AA	2017	Corn	GroupA-1077	2.80	0.08	2.29	0.06	1521.14	22.54	2373	3860	-1487	RF
SP	AA	2017	Corn	GroupA-1078	2.72	0.10	2.11	0.04	3305.23	21.86	1799	3860	-2061	RF
RD	AA	2017	Corn	GroupA-1079	2.91	0.04	2.42	0.03	28035.93	23.42	1261	3860	-2599	RF
CS	AA	2018	Corn	GroupA-1080	3.10	0.11	2.50	0.06	1521.14	27.62	2437	3975	-1538	RF
SP	AA	2018	Corn	GroupA-1081	2.94	0.15	2.34	0.05	3305.23	26.24	1988	3975	-1987	RF
1P	AA	2018	Corn	GroupA-1082	4.06	0.04	3.49	0.02	14966.67	36.23	770	3975	-3205	RF
2PB	AA	2018	Corn	GroupA-1083	3.79	0.00	3.26	0.04	14577.73	33.85	1764	3975	-2211	RF
1P	AA	2020	Corn	GroupA-1084	2.28	0.00	1.93	0.02	14966.67	18.06	770	3962	-3192	RF
2PB	AA	2020	Corn	GroupA-1085	2.44	0.05	2.09	0.04	14577.73	19.36	1769	3962	-2193	RF
AA	CS	2015	Corn	GroupA-1086	3.36	0.14	2.71	0.13	1521.14	38.45	3961	2451	1510	RF
RD	CS	2015	Corn	GroupA-1087	2.62	0.00	2.25	0.03	28340.32	29.91	1261	2451	-1190	RF
AA	CS	2016	Corn	GroupA-1088	2.07	0.37	1.64	0.13	1521.14	23.03	3973	2440	1533	RF
SP	CS	2016	Corn	GroupA-1089	1.87	0.50	1.38	0.06	2392.70	20.73	1988	2440	-452	RF
AA	CS	2017	Corn	GroupA-1090	2.02	0.11	1.58	0.13	1521.14	16.64	3860	2373	1487	RF
SP	CS	2017	Corn	GroupA-1091	2.09	0.08	1.62	0.04	2392.70	17.22	1799	2373	-574	RF
RD	CS	2017	Corn	GroupA-1092	1.89	0.12	1.46	0.03	28340.32	15.57	1261	2373	-1112	RF
AA	CS	2018	Corn	GroupA-1093	2.98	0.14	2.49	0.13	1521.14	26.02	3975	2437	1538	RF
SP	CS	2018	Corn	GroupA-1094	2.88	0.26	2.39	0.06	2392.70	25.11	1988	2437	-449	RF
1P	CS	2018	Corn	GroupA-1095	4.50	0.00	3.87	0.02	13564.88	39.26	770	2437	-1667	RF
2PB	CS	2018	Corn	GroupA-1096	3.73	0.03	3.21	0.05	13145.07	32.54	1764	2437	-673	RF
SP	CS	2019	Corn	GroupA-1097	2.54	0.19	2.04	0.06	2392.70	23.32	1989	2440	-451	RF
RD	CS	2019	Corn	GroupA-1098	3.09	0.03	2.61	0.03	28340.32	28.38	1257	2440	-1183	RF
SP	CS	2021	Corn	GroupA-1099	1.98	0.14	1.59	0.06	2392.70	13.95	1978	2437	-459	RF
MP	CS	2021	Corn	GroupA-1100	3.50	0.20	3.16	0.02	10327.57	24.65	924	2437	-1513	RF
6	JL	2017	Corn	GroupA-1101	3.02	0.04	2.49	0.01	31086.42	23.84	248	862	-614	RF
AM	JL	2017	Corn	GroupA-1102	2.78	0.00	2.33	0.05	30699.89	21.94	1746	862	884	RF
CF	JL	2017	Corn	GroupA-1103	3.32	0.22	2.87	0.03	30895.46	26.18	1099	862	237	RF
HB	JL	2017	Corn	GroupA-1104	5.54	0.01	4.99	0.01	30527.42	43.64	557	862	-305	RF
NH	JL	2017	Corn	GroupA-1105	5.13	0.00	4.58	0.00	31398.77	40.42	226	862	-636	RF
PB	JL	2017	Corn	GroupA-1106	3.03	0.01	2.58	0.01	32178.80	23.89	338	862	-524	RF
PTB	JL	2017	Corn	GroupA-1107	7.32	0.12	6.81	0.01	29375.83	57.70	296	862	-566	RF
PL	JL	2017	Corn	GroupA-1108	3.55	0.11	3.09	0.02	31562.14	27.95	979	862	117	RF
PLB	JL	2017	Corn	GroupA-1109	4.35	0.18	3.88	0.01	31878.96	34.31	508	862	-354	RF
BG	JL	2017	Corn	GroupA-1110	4.07	0.06	3.65	0.04	34820.43	32.10	1426	862	564	RF
BBEA	JL	2017	Corn	GroupA-1111	3.34	0.03	2.94	0.08	35161.19	26.30	2889	862	2027	RF
BS	JL	2017	Corn	GroupA-1112	5.22	0.07	4.77	0.02	27818.58	41.16	757	862	-105	RF
6	JL	2018	Corn	GroupA-1113	3.61	0.15	3.06	0.01	31086.42	43.23	244	901	-657	RF
AM	JL	2018	Corn	GroupA-1114	2.89	0.12	2.42	0.04	30699.89	34.57	1727	901	826	RF
CF	JL	2018	Corn	GroupA-1115	3.48	0.01	2.90	0.02	30895.46	41.59	1098	901	197	RF
HB	JL	2018	Corn	GroupA-1116	3.95	0.15	3.39	0.01	30527.42	47.30	363	901	-538	RF
NH	JL	2018	Corn	GroupA-1117	5.48	0.02	4.83	0.00	31398.77	65.61	222	901	-679	RF
PL	JL	2018	Corn	GroupA-1118	3.50	0.01	2.96	0.02	31562.14	41.90	974	901	73	RF
PLB	JL	2018	Corn	GroupA-1119	4.16	0.00	3.58	0.01	31878.96	49.83	506	901	-395	RF
BG	JL	2018	Corn	GroupA-1120	2.85	0.08	2.36	0.03	34820.43	34.15	1421	901	520	RF
BBEA	JL	2018	Corn	GroupA-1121	3.17	0.00	2.67	0.09	35161.19	37.90	3047	901	2146	RF
AM	JL	2020	Corn	GroupA-1122	3.41	0.00	3.02	0.02	30699.89	31.12	742	889	-147	RF
CF	JL	2020	Corn	GroupA-1123	3.39	0.08	2.96	0.03	30895.46	30.90	1095	889	206	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PB	JL	2020	Corn	GroupA-1124	2.63	0.00	2.27	0.01	32178.80	24.03	333	889	-556	RF
PE	JL	2020	Corn	GroupA-1125	2.19	0.07	1.62	0.02	31805.51	19.98	942	889	53	RF
PW	JL	2020	Corn	GroupA-1126	2.21	0.00	1.87	0.01	31235.93	20.14	260	889	-629	RF
PL	JL	2020	Corn	GroupA-1127	2.55	0.07	2.21	0.02	31562.14	23.26	976	889	87	RF
PLB	JL	2020	Corn	GroupA-1128	3.09	0.00	2.67	0.01	31878.96	28.16	498	889	-391	RF
AA	SP	2016	Corn	GroupA-1129	2.35	0.31	1.87	0.14	3305.23	26.93	3973	1988	1985	RF
CS	SP	2016	Corn	GroupA-1130	2.21	0.41	1.54	0.06	2392.70	25.25	2440	1988	452	RF
AA	SP	2017	Corn	GroupA-1131	2.51	0.18	2.02	0.13	3305.23	19.89	3860	1799	2061	RF
CS	SP	2017	Corn	GroupA-1132	2.85	0.01	2.36	0.06	2392.70	22.62	2373	1799	574	RF
RD	SP	2017	Corn	GroupA-1133	2.86	0.02	2.45	0.03	30697.43	22.68	1261	1799	-538	RF
AA	SP	2018	Corn	GroupA-1134	2.76	0.16	2.16	0.13	3305.23	26.93	3975	1988	1987	RF
CS	SP	2018	Corn	GroupA-1135	2.73	0.25	2.18	0.06	2392.70	26.59	2437	1988	449	RF
1P	SP	2018	Corn	GroupA-1136	3.56	0.00	3.01	0.02	13803.38	34.64	770	1988	-1218	RF
2PB	SP	2018	Corn	GroupA-1137	3.05	0.15	2.53	0.05	13252.46	29.75	1764	1988	-224	RF
CS	SP	2019	Corn	GroupA-1138	2.39	0.26	1.86	0.06	2392.70	22.82	2440	1989	451	RF
RD	SP	2019	Corn	GroupA-1139	2.91	0.14	2.42	0.03	30697.43	27.73	1257	1989	-732	RF
CS	SP	2021	Corn	GroupA-1140	2.02	0.15	1.48	0.07	2392.70	15.22	2437	1978	459	RF
MP	SP	2021	Corn	GroupA-1141	2.84	0.12	2.48	0.02	10398.84	21.43	924	1978	-1054	RF
AA	1P	2018	Corn	GroupA-1142	2.78	0.00	2.27	0.12	14966.67	26.97	3975	770	3205	RF
CS	1P	2018	Corn	GroupA-1143	3.30	0.01	2.78	0.06	13564.88	31.98	2437	770	1667	RF
SP	1P	2018	Corn	GroupA-1144	2.96	0.00	2.34	0.05	13803.38	28.71	1988	770	1218	RF
2PB	1P	2018	Corn	GroupA-1145	2.53	0.09	2.01	0.05	884.63	24.50	1764	770	994	RF
AA	1P	2020	Corn	GroupA-1146	1.72	0.00	1.33	0.12	14966.67	13.63	3962	770	3192	RF
2PB	1P	2020	Corn	GroupA-1147	1.52	0.08	1.20	0.05	884.63	12.06	1769	770	999	RF
AA	2PB	2018	Corn	GroupA-1148	3.05	0.00	2.48	0.11	14577.73	28.64	3975	1764	2211	RF
CS	2PB	2018	Corn	GroupA-1149	3.64	0.01	3.02	0.06	13145.07	34.24	2437	1764	673	RF
SP	2PB	2018	Corn	GroupA-1150	3.01	0.01	2.40	0.04	13252.46	28.32	1988	1764	224	RF
1P	2PB	2018	Corn	GroupA-1151	3.30	0.03	2.76	0.02	884.63	31.02	770	1764	-994	RF
AA	2PB	2020	Corn	GroupA-1152	2.14	0.03	1.68	0.11	14577.73	17.89	3962	1769	2193	RF
1P	2PB	2020	Corn	GroupA-1153	1.86	0.08	1.46	0.02	884.63	15.55	770	1769	-999	RF
CS	MP	2021	Corn	GroupA-1154	2.09	0.19	1.63	0.08	10327.57	19.38	2437	924	1513	RF
SP	MP	2021	Corn	GroupA-1155	2.67	0.04	2.12	0.06	10398.84	24.78	1978	924	1054	RF
6	BS	2017	Corn	GroupA-1156	4.05	0.07	3.14	0.01	3688.53	44.10	248	757	-509	RF
AM	BS	2017	Corn	GroupA-1157	3.25	0.00	2.47	0.05	4011.02	35.40	1746	757	989	RF
CF	BS	2017	Corn	GroupA-1158	3.24	0.00	2.46	0.03	3076.95	35.24	1099	757	342	RF
HB	BS	2017	Corn	GroupA-1159	3.51	0.03	2.92	0.01	3100.07	38.21	557	757	-200	RF
NH	BS	2017	Corn	GroupA-1160	2.90	0.01	2.43	0.00	5253.94	31.58	226	757	-531	RF
PB	BS	2017	Corn	GroupA-1161	3.06	0.00	2.31	0.01	4411.96	33.33	338	757	-419	RF
PTB	BS	2017	Corn	GroupA-1162	4.44	0.01	3.80	0.01	2114.72	48.37	296	757	-461	RF
PL	BS	2017	Corn	GroupA-1163	2.87	0.03	2.25	0.02	3972.53	31.28	979	757	222	RF
PLB	BS	2017	Corn	GroupA-1164	2.77	0.00	2.16	0.01	4109.93	30.18	508	757	-249	RF
BG	BS	2017	Corn	GroupA-1165	2.74	0.00	2.10	0.05	7029.70	29.78	1426	757	669	RF
BBEA	BS	2017	Corn	GroupA-1166	3.09	0.00	2.30	0.11	7352.54	33.60	2889	757	2132	RF
JL	BS	2017	Corn	GroupA-1167	3.52	0.02	2.74	0.02	27818.58	38.30	862	757	105	RF
6	BS	2019	Corn	GroupA-1168	3.84	0.00	3.42	0.01	3688.53	40.26	246	749	-503	RF
AM	BS	2019	Corn	GroupA-1169	4.28	0.01	3.83	0.02	4011.02	44.89	992	749	243	RF
HB	BS	2019	Corn	GroupA-1170	4.10	0.04	3.58	0.01	3100.07	42.95	365	749	-384	RF
NH	BS	2019	Corn	GroupA-1171	4.80	0.00	4.31	0.00	5253.94	50.30	215	749	-534	RF
BG	BS	2019	Corn	GroupA-1172	3.20	0.01	2.87	0.05	7029.70	33.55	1428	749	679	RF
BBEA	BS	2019	Corn	GroupA-1173	3.74	0.00	3.31	0.12	7352.54	39.23	3067	749	2318	RF
BG	BS	2021	Corn	GroupA-1174	3.82	0.03	3.06	0.05	7029.70	46.64	1430	645	785	RF
BBEA	BS	2021	Corn	GroupA-1175	2.84	0.00	2.22	0.12	7352.54	34.70	3029	645	2384	RF
AA	RD	2015	Corn	GroupA-1176	2.97	0.00	2.51	0.12	28035.93	34.11	3961	1261	2700	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CS	RD	2015	Corn	GroupA-1177	1.59	0.04	1.26	0.03	28340.32	18.23	2451	1261	1190	RF
AA	RD	2017	Corn	GroupA-1178	2.04	0.12	1.53	0.12	28035.93	16.98	3860	1261	2599	RF
CS	RD	2017	Corn	GroupA-1179	2.05	0.13	1.60	0.06	28340.32	17.10	2373	1261	1112	RF
SP	RD	2017	Corn	GroupA-1180	2.08	0.08	1.55	0.04	30697.43	17.34	1799	1261	538	RF
CS	RD	2019	Corn	GroupA-1181	2.38	0.00	1.91	0.06	28340.32	23.88	2440	1257	1183	RF
SP	RD	2019	Corn	GroupA-1182	2.37	0.00	1.88	0.05	30697.43	23.72	1989	1257	732	RF
AM	6	2013	Soybeans	GroupA-0001	0.97	0.05	0.81	0.02	1216.49	25.40	1748	249	1499	SVM
HB	6	2013	Soybeans	GroupA-0002	1.03	0.04	0.93	0.00	593.20	26.95	558	249	309	SVM
NH	6	2013	Soybeans	GroupA-0003	1.79	0.00	1.70	0.00	2271.12	46.99	173	249	-76	SVM
PTB	6	2013	Soybeans	GroupA-0004	0.65	0.02	0.49	0.00	1728.12	17.18	289	249	40	SVM
BG	6	2013	Soybeans	GroupA-0005	1.10	0.10	0.92	0.02	3938.74	28.83	1438	249	1189	SVM
BBEA	6	2013	Soybeans	GroupA-0006	1.34	0.06	1.19	0.08	4348.89	35.15	3081	249	2832	SVM
AA	6	2013	Soybeans	GroupA-0007	2.90	0.02	2.86	0.00	30211.35	76.17	378	249	129	SVM
SP	6	2013	Soybeans	GroupA-0008	2.99	0.08	2.95	0.02	32717.90	78.65	1994	249	1745	SVM
BS	6	2013	Soybeans	GroupA-0009	0.85	0.06	0.72	0.00	3688.53	22.41	656	249	407	SVM
AM	6	2014	Soybeans	GroupA-0010	0.86	0.03	0.74	0.02	1216.49	19.73	1748	250	1498	SVM
HB	6	2014	Soybeans	GroupA-0011	1.82	0.00	1.64	0.00	593.20	41.58	555	250	305	SVM
PB	6	2014	Soybeans	GroupA-0012	1.57	0.04	1.47	0.00	2775.62	35.95	334	250	84	SVM
PTB	6	2014	Soybeans	GroupA-0013	1.51	0.01	1.41	0.00	1728.12	34.62	299	250	49	SVM
PL	6	2014	Soybeans	GroupA-0014	0.64	0.07	0.54	0.01	632.74	14.65	974	250	724	SVM
PLB	6	2014	Soybeans	GroupA-0015	0.63	0.06	0.48	0.00	1403.96	14.37	500	250	250	SVM
BG	6	2014	Soybeans	GroupA-0016	2.62	0.13	2.49	0.02	3938.74	59.99	1438	250	1188	SVM
BBEA	6	2014	Soybeans	GroupA-0017	2.60	0.02	2.52	0.07	4348.89	59.51	3084	250	2834	SVM
SP	6	2014	Soybeans	GroupA-0018	2.62	0.06	2.54	0.03	32717.90	60.02	1993	250	1743	SVM
BS	6	2014	Soybeans	GroupA-0019	2.14	0.00	1.96	0.00	3688.53	48.90	656	250	406	SVM
AM	6	2015	Soybeans	GroupA-0020	0.94	0.02	0.84	0.02	1216.49	35.68	1467	251	1216	SVM
CF	6	2015	Soybeans	GroupA-0021	0.82	0.00	0.67	0.01	1790.97	31.20	1097	251	846	SVM
HB	6	2015	Soybeans	GroupA-0022	1.94	0.01	1.84	0.00	593.20	73.48	549	251	298	SVM
PB	6	2015	Soybeans	GroupA-0023	0.80	0.03	0.69	0.00	2775.62	30.22	327	251	76	SVM
PTB	6	2015	Soybeans	GroupA-0024	0.82	0.00	0.74	0.00	1728.12	31.03	303	251	52	SVM
PL	6	2015	Soybeans	GroupA-0025	0.64	0.02	0.53	0.01	632.74	24.20	905	251	654	SVM
PLB	6	2015	Soybeans	GroupA-0026	0.69	0.00	0.51	0.00	1403.96	26.00	499	251	248	SVM
BG	6	2015	Soybeans	GroupA-0027	1.66	0.03	1.55	0.01	3938.74	62.91	1384	251	1133	SVM
BBEA	6	2015	Soybeans	GroupA-0028	1.90	0.05	1.81	0.06	4348.89	72.05	2811	251	2560	SVM
BS	6	2015	Soybeans	GroupA-0029	1.37	0.00	1.26	0.00	3688.53	51.89	659	251	408	SVM
AM	6	2020	Soybeans	GroupA-0030	0.67	0.01	0.46	0.01	1216.49	18.08	991	247	744	SVM
HB	6	2020	Soybeans	GroupA-0031	0.67	0.03	0.51	0.00	593.20	17.96	555	247	308	SVM
NH	6	2020	Soybeans	GroupA-0032	1.35	0.00	1.25	0.00	2271.12	36.49	181	247	-66	SVM
PTB	6	2020	Soybeans	GroupA-0033	2.14	0.00	2.06	0.00	1728.12	57.63	262	247	15	SVM
BG	6	2020	Soybeans	GroupA-0034	0.64	0.00	0.47	0.02	3938.74	17.17	1436	247	1189	SVM
BBEA	6	2020	Soybeans	GroupA-0035	0.75	0.09	0.62	0.07	4348.89	20.30	3036	247	2789	SVM
BS	6	2020	Soybeans	GroupA-0036	0.87	0.01	0.66	0.01	3688.53	23.38	748	247	501	SVM
AM	6	2021	Soybeans	GroupA-0037	0.90	0.01	0.72	0.02	1216.49	23.24	1730	246	1484	SVM
CF	6	2021	Soybeans	GroupA-0038	1.09	0.03	0.88	0.01	1790.97	28.19	1090	246	844	SVM
HB	6	2021	Soybeans	GroupA-0039	0.94	0.03	0.75	0.00	593.20	24.28	363	246	117	SVM
NH	6	2021	Soybeans	GroupA-0040	1.91	0.01	1.77	0.00	2271.12	49.62	51	246	-195	SVM
PB	6	2021	Soybeans	GroupA-0041	0.95	0.00	0.77	0.00	2775.62	24.65	246	246	0	SVM
PE	6	2021	Soybeans	GroupA-0042	1.59	0.00	1.36	0.01	3050.40	41.33	938	246	692	SVM
PW	6	2021	Soybeans	GroupA-0043	1.20	0.12	0.99	0.00	3135.13	31.02	246	246	0	SVM
PTB	6	2021	Soybeans	GroupA-0044	2.10	0.00	1.97	0.00	1728.12	54.49	251	246	5	SVM
PL	6	2021	Soybeans	GroupA-0045	0.96	0.00	0.71	0.01	632.74	24.87	978	246	732	SVM
PLB	6	2021	Soybeans	GroupA-0046	2.05	0.06	1.84	0.00	1403.96	53.08	491	246	245	SVM
JL	6	2021	Soybeans	GroupA-0047	1.15	0.00	0.89	0.01	31086.42	29.77	884	246	638	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BS	6	2021	Soybeans	GroupA-0048	3.01	0.01	2.90	0.00	3688.53	77.97	85	246	-161	SVM
6	AM	2013	Soybeans	GroupA-0049	0.86	0.03	0.68	0.00	1216.49	26.68	249	1748	-1499	SVM
HB	AM	2013	Soybeans	GroupA-0050	0.88	0.11	0.71	0.00	1351.32	27.08	558	1748	-1190	SVM
NH	AM	2013	Soybeans	GroupA-0051	1.37	0.12	1.20	0.00	1283.59	42.35	173	1748	-1575	SVM
PTB	AM	2013	Soybeans	GroupA-0052	1.00	0.02	0.77	0.00	1901.85	30.79	289	1748	-1459	SVM
BG	AM	2013	Soybeans	GroupA-0053	0.78	0.18	0.59	0.01	4801.99	23.97	1438	1748	-310	SVM
BBEA	AM	2013	Soybeans	GroupA-0054	1.05	0.00	0.88	0.07	5233.55	32.34	3081	1748	1333	SVM
AA	AM	2013	Soybeans	GroupA-0055	2.47	0.00	2.34	0.00	29801.06	76.52	378	1748	-1370	SVM
SP	AM	2013	Soybeans	GroupA-0056	2.55	0.01	2.43	0.02	32227.99	78.73	1994	1748	246	SVM
BS	AM	2013	Soybeans	GroupA-0057	0.80	0.14	0.64	0.00	4011.02	24.68	656	1748	-1092	SVM
6	AM	2014	Soybeans	GroupA-0058	0.89	0.00	0.69	0.00	1216.49	22.74	250	1748	-1498	SVM
HB	AM	2014	Soybeans	GroupA-0059	1.31	0.02	1.12	0.00	1351.32	33.57	555	1748	-1193	SVM
PB	AM	2014	Soybeans	GroupA-0060	1.40	0.02	1.25	0.00	3991.90	35.68	334	1748	-1414	SVM
PTB	AM	2014	Soybeans	GroupA-0061	1.40	0.08	1.21	0.00	1901.85	35.78	299	1748	-1449	SVM
PL	AM	2014	Soybeans	GroupA-0062	0.87	0.03	0.67	0.01	1797.09	22.15	974	1748	-774	SVM
PLB	AM	2014	Soybeans	GroupA-0063	1.01	0.00	0.80	0.00	2601.80	25.92	500	1748	-1248	SVM
BG	AM	2014	Soybeans	GroupA-0064	2.23	0.02	2.08	0.01	4801.99	57.07	1438	1748	-310	SVM
BBEA	AM	2014	Soybeans	GroupA-0065	2.22	0.01	2.07	0.07	5233.55	56.77	3084	1748	1336	SVM
SP	AM	2014	Soybeans	GroupA-0066	2.62	0.02	2.39	0.03	32227.99	66.94	1993	1748	245	SVM
BS	AM	2014	Soybeans	GroupA-0067	2.05	0.13	1.91	0.00	4011.02	52.31	656	1748	-1092	SVM
6	AM	2015	Soybeans	GroupA-0068	0.73	0.00	0.57	0.00	1216.49	35.25	251	1467	-1216	SVM
CF	AM	2015	Soybeans	GroupA-0069	1.35	0.01	1.23	0.01	2925.31	65.52	1097	1467	-370	SVM
HB	AM	2015	Soybeans	GroupA-0070	1.45	0.00	1.31	0.00	1351.32	70.33	549	1467	-918	SVM
PB	AM	2015	Soybeans	GroupA-0071	0.63	0.00	0.53	0.00	3991.90	30.55	327	1467	-1140	SVM
PTB	AM	2015	Soybeans	GroupA-0072	0.60	0.00	0.51	0.00	1901.85	29.32	303	1467	-1164	SVM
PL	AM	2015	Soybeans	GroupA-0073	0.82	0.01	0.67	0.01	1797.09	39.81	905	1467	-562	SVM
PLB	AM	2015	Soybeans	GroupA-0074	1.00	0.06	0.84	0.00	2601.80	48.47	499	1467	-968	SVM
BG	AM	2015	Soybeans	GroupA-0075	1.27	0.00	1.12	0.01	4801.99	61.63	1384	1467	-83	SVM
BBEA	AM	2015	Soybeans	GroupA-0076	1.39	0.00	1.25	0.05	5233.55	67.51	2811	1467	1344	SVM
BS	AM	2015	Soybeans	GroupA-0077	1.08	0.05	0.95	0.00	4011.02	52.37	659	1467	-808	SVM
CF	AM	2019	Soybeans	GroupA-0078	0.91	0.00	0.70	0.01	2925.31	33.00	1095	745	350	SVM
HB	AM	2019	Soybeans	GroupA-0079	1.40	0.04	1.20	0.00	1351.32	50.85	174	745	-571	SVM
PB	AM	2019	Soybeans	GroupA-0080	1.26	0.00	1.07	0.00	3991.90	45.78	278	745	-467	SVM
PE	AM	2019	Soybeans	GroupA-0081	1.33	0.09	1.12	0.01	4256.93	48.25	942	745	197	SVM
PW	AM	2019	Soybeans	GroupA-0082	1.06	0.01	0.83	0.00	4299.79	38.34	259	745	-486	SVM
PTB	AM	2019	Soybeans	GroupA-0083	1.41	0.00	1.21	0.00	1901.85	51.14	270	745	-475	SVM
PL	AM	2019	Soybeans	GroupA-0084	0.92	0.00	0.76	0.01	1797.09	33.45	968	745	223	SVM
PLB	AM	2019	Soybeans	GroupA-0085	0.94	0.21	0.76	0.00	2601.80	34.08	502	745	-243	SVM
JL	AM	2019	Soybeans	GroupA-0086	1.13	0.00	0.94	0.01	30699.89	40.94	888	745	143	SVM
6	AM	2020	Soybeans	GroupA-0087	0.99	0.00	0.88	0.00	1216.49	23.23	247	991	-744	SVM
HB	AM	2020	Soybeans	GroupA-0088	0.95	0.00	0.77	0.00	1351.32	22.27	555	991	-436	SVM
NH	AM	2020	Soybeans	GroupA-0089	1.69	0.00	1.59	0.00	1283.59	39.64	181	991	-810	SVM
PTB	AM	2020	Soybeans	GroupA-0090	2.69	0.00	2.61	0.00	1901.85	62.88	262	991	-729	SVM
BG	AM	2020	Soybeans	GroupA-0091	1.05	0.00	0.89	0.01	4801.99	24.67	1436	991	445	SVM
BBEA	AM	2020	Soybeans	GroupA-0092	0.82	0.03	0.67	0.06	5233.55	19.17	3036	991	2045	SVM
BS	AM	2020	Soybeans	GroupA-0093	1.43	0.03	1.22	0.00	4011.02	33.55	748	991	-243	SVM
6	AM	2021	Soybeans	GroupA-0094	1.04	0.02	0.75	0.00	1216.49	29.50	246	1730	-1484	SVM
CF	AM	2021	Soybeans	GroupA-0095	1.29	0.03	0.96	0.01	2925.31	36.51	1090	1730	-640	SVM
HB	AM	2021	Soybeans	GroupA-0096	1.06	0.00	0.76	0.00	1351.32	30.05	363	1730	-1367	SVM
NH	AM	2021	Soybeans	GroupA-0097	1.64	0.04	1.49	0.00	1283.59	46.43	51	1730	-1679	SVM
PB	AM	2021	Soybeans	GroupA-0098	1.13	0.00	0.93	0.00	3991.90	32.02	246	1730	-1484	SVM
PE	AM	2021	Soybeans	GroupA-0099	2.29	0.11	2.08	0.01	4256.93	64.82	938	1730	-792	SVM
PW	AM	2021	Soybeans	GroupA-0100	1.34	0.01	1.00	0.00	4299.79	37.86	246	1730	-1484	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PTB	AM	2021	Soybeans	GroupA-0101	1.99	0.02	1.79	0.00	1901.85	56.27	251	1730	-1479	SVM
PL	AM	2021	Soybeans	GroupA-0102	1.24	0.00	0.88	0.01	1797.09	35.09	978	1730	-752	SVM
PLB	AM	2021	Soybeans	GroupA-0103	1.85	0.02	1.52	0.00	2601.80	52.31	491	1730	-1239	SVM
JL	AM	2021	Soybeans	GroupA-0104	1.41	0.00	1.04	0.01	30699.89	40.03	884	1730	-846	SVM
BS	AM	2021	Soybeans	GroupA-0105	2.92	0.02	2.75	0.00	4011.02	82.79	85	1730	-1645	SVM
PB	CF	2012	Soybeans	GroupA-0106	1.06	0.00	0.91	0.00	1477.63	27.74	335	1099	-764	SVM
PL	CF	2012	Soybeans	GroupA-0107	0.71	0.00	0.57	0.01	1531.30	18.50	855	1099	-244	SVM
PLB	CF	2012	Soybeans	GroupA-0108	0.67	0.00	0.55	0.00	1177.89	17.46	502	1099	-597	SVM
CS	CF	2012	Soybeans	GroupA-0109	0.81	0.00	0.67	0.03	30336.27	21.25	1942	1099	843	SVM
SP	CF	2012	Soybeans	GroupA-0110	1.51	0.00	1.33	0.03	32684.73	39.37	1929	1099	830	SVM
6	CF	2015	Soybeans	GroupA-0111	0.91	0.01	0.81	0.00	1790.97	27.37	251	1097	-846	SVM
AM	CF	2015	Soybeans	GroupA-0112	1.75	0.04	1.65	0.02	2925.31	52.35	1467	1097	370	SVM
HB	CF	2015	Soybeans	GroupA-0113	2.68	0.04	2.56	0.00	1609.48	80.14	549	1097	-548	SVM
PB	CF	2015	Soybeans	GroupA-0114	1.59	0.01	1.48	0.00	1477.63	47.48	327	1097	-770	SVM
PTB	CF	2015	Soybeans	GroupA-0115	1.74	0.00	1.66	0.00	2125.67	52.20	303	1097	-794	SVM
PL	CF	2015	Soybeans	GroupA-0116	0.77	0.05	0.66	0.01	1531.30	23.19	905	1097	-192	SVM
PLB	CF	2015	Soybeans	GroupA-0117	1.18	0.00	1.03	0.00	1177.89	35.31	499	1097	-598	SVM
BG	CF	2015	Soybeans	GroupA-0118	2.65	0.00	2.56	0.01	3976.07	79.26	1384	1097	287	SVM
BBEA	CF	2015	Soybeans	GroupA-0119	2.52	0.02	2.46	0.06	4282.54	75.40	2811	1097	1714	SVM
BS	CF	2015	Soybeans	GroupA-0120	2.33	0.00	2.24	0.00	3076.95	69.64	659	1097	-438	SVM
HB	CF	2016	Soybeans	GroupA-0121	1.18	0.01	1.06	0.00	1609.48	33.56	181	1083	-902	SVM
PB	CF	2016	Soybeans	GroupA-0122	1.41	0.01	1.29	0.00	1477.63	40.06	331	1083	-752	SVM
PTB	CF	2016	Soybeans	GroupA-0123	1.13	0.02	1.02	0.00	2125.67	32.10	297	1083	-786	SVM
BS	CF	2016	Soybeans	GroupA-0124	1.52	0.03	1.41	0.00	3076.95	43.29	655	1083	-428	SVM
AM	CF	2019	Soybeans	GroupA-0125	1.32	0.01	1.14	0.01	2925.31	38.24	745	1095	-350	SVM
HB	CF	2019	Soybeans	GroupA-0126	1.71	0.05	1.55	0.00	1609.48	49.35	174	1095	-921	SVM
PB	CF	2019	Soybeans	GroupA-0127	1.63	0.03	1.51	0.00	1477.63	47.10	278	1095	-817	SVM
PE	CF	2019	Soybeans	GroupA-0128	0.65	0.02	0.51	0.01	1470.34	18.89	942	1095	-153	SVM
PW	CF	2019	Soybeans	GroupA-0129	0.61	0.01	0.48	0.00	1380.51	17.61	259	1095	-836	SVM
PTB	CF	2019	Soybeans	GroupA-0130	2.55	0.00	2.44	0.00	2125.67	73.62	270	1095	-825	SVM
PL	CF	2019	Soybeans	GroupA-0131	0.76	0.00	0.63	0.01	1531.30	22.00	968	1095	-127	SVM
PLB	CF	2019	Soybeans	GroupA-0132	0.85	0.01	0.66	0.00	1177.89	24.47	502	1095	-593	SVM
JL	CF	2019	Soybeans	GroupA-0133	1.48	0.03	1.37	0.01	30895.46	42.66	888	1095	-207	SVM
6	CF	2021	Soybeans	GroupA-0134	1.23	0.00	1.05	0.00	1790.97	27.81	246	1090	-844	SVM
AM	CF	2021	Soybeans	GroupA-0135	1.51	0.04	1.30	0.02	2925.31	33.92	1730	1090	640	SVM
HB	CF	2021	Soybeans	GroupA-0136	0.95	0.00	0.75	0.00	1609.48	21.47	363	1090	-727	SVM
NH	CF	2021	Soybeans	GroupA-0137	2.45	0.02	2.34	0.00	4061.52	55.17	51	1090	-1039	SVM
PB	CF	2021	Soybeans	GroupA-0138	1.37	0.01	1.15	0.00	1477.63	30.79	246	1090	-844	SVM
PE	CF	2021	Soybeans	GroupA-0139	1.09	0.00	0.86	0.01	1470.34	24.44	938	1090	-152	SVM
PW	CF	2021	Soybeans	GroupA-0140	0.89	0.00	0.71	0.00	1380.51	19.97	246	1090	-844	SVM
PTB	CF	2021	Soybeans	GroupA-0141	3.04	0.00	2.91	0.00	2125.67	68.37	251	1090	-839	SVM
PL	CF	2021	Soybeans	GroupA-0142	0.83	0.01	0.64	0.01	1531.30	18.62	978	1090	-112	SVM
PLB	CF	2021	Soybeans	GroupA-0143	1.27	0.00	1.00	0.00	1177.89	28.49	491	1090	-599	SVM
JL	CF	2021	Soybeans	GroupA-0144	0.81	0.00	0.63	0.01	30895.46	18.34	884	1090	-206	SVM
BS	CF	2021	Soybeans	GroupA-0145	3.78	0.00	3.70	0.00	3076.95	85.05	85	1090	-1005	SVM
6	HB	2013	Soybeans	GroupA-0146	0.96	0.01	0.81	0.00	593.20	33.96	249	558	-309	SVM
AM	HB	2013	Soybeans	GroupA-0147	0.72	0.02	0.58	0.02	1351.32	25.37	1748	558	1190	SVM
NH	HB	2013	Soybeans	GroupA-0148	1.20	0.01	1.06	0.00	2580.18	42.23	173	558	-385	SVM
PTB	HB	2013	Soybeans	GroupA-0149	1.26	0.00	1.05	0.00	1152.69	44.44	289	558	-269	SVM
BG	HB	2013	Soybeans	GroupA-0150	0.88	0.02	0.70	0.02	4415.29	31.18	1438	558	880	SVM
BBEA	HB	2013	Soybeans	GroupA-0151	0.73	0.00	0.60	0.08	4811.25	25.69	3081	558	2523	SVM
AA	HB	2013	Soybeans	GroupA-0152	1.99	0.01	1.92	0.00	29656.73	70.37	378	558	-180	SVM
SP	HB	2013	Soybeans	GroupA-0153	2.08	0.01	2.00	0.02	32179.07	73.60	1994	558	1436	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BS	HB	2013	Soybeans	GroupA-0154	0.81	0.00	0.63	0.00	3100.07	28.71	656	558	98	SVM
6	HB	2014	Soybeans	GroupA-0155	1.62	0.02	1.35	0.00	593.20	53.02	250	555	-305	SVM
AM	HB	2014	Soybeans	GroupA-0156	1.22	0.00	1.03	0.02	1351.32	39.89	1748	555	1193	SVM
PB	HB	2014	Soybeans	GroupA-0157	1.11	0.00	0.89	0.00	2853.21	36.25	334	555	-221	SVM
PTB	HB	2014	Soybeans	GroupA-0158	1.03	0.04	0.78	0.00	1152.69	33.68	299	555	-256	SVM
PL	HB	2014	Soybeans	GroupA-0159	1.38	0.01	1.11	0.01	1056.49	45.04	974	555	419	SVM
PLB	HB	2014	Soybeans	GroupA-0160	1.65	0.01	1.32	0.00	1650.52	53.77	500	555	-55	SVM
BG	HB	2014	Soybeans	GroupA-0161	1.50	0.07	1.29	0.02	4415.29	48.95	1438	555	883	SVM
BBEA	HB	2014	Soybeans	GroupA-0162	1.70	0.01	1.47	0.07	4811.25	55.56	3084	555	2529	SVM
SP	HB	2014	Soybeans	GroupA-0163	1.62	0.00	1.40	0.03	32179.07	52.91	1993	555	1438	SVM
BS	HB	2014	Soybeans	GroupA-0164	1.73	0.02	1.28	0.00	3100.07	56.55	656	555	101	SVM
BG	HB	2015	Soybeans	GroupA-0172	0.73	0.13	0.58	0.01	4415.29	72.20	1384	549	835	SVM
BBEA	HB	2015	Soybeans	GroupA-0173	0.73	0.13	0.57	0.06	4811.25	72.74	2811	549	2262	SVM
BS	HB	2015	Soybeans	GroupA-0174	0.90	0.02	0.78	0.00	3100.07	89.08	659	549	110	SVM
CF	HB	2016	Soybeans	GroupA-0175	1.10	0.06	0.88	0.01	1609.48	45.87	1083	181	902	SVM
PB	HB	2016	Soybeans	GroupA-0176	0.79	0.01	0.60	0.00	2853.21	33.04	331	181	150	SVM
PTB	HB	2016	Soybeans	GroupA-0177	1.01	0.08	0.80	0.00	1152.69	42.25	297	181	116	SVM
BS	HB	2016	Soybeans	GroupA-0178	0.97	0.03	0.83	0.00	3100.07	40.45	655	181	474	SVM
PB	HB	2018	Soybeans	GroupA-0179	1.22	0.01	1.00	0.00	2853.21	33.98	327	184	143	SVM
PE	HB	2018	Soybeans	GroupA-0180	1.31	0.00	1.11	0.01	3020.77	36.68	941	184	757	SVM
PW	HB	2018	Soybeans	GroupA-0181	1.37	0.03	1.18	0.00	2989.69	38.28	257	184	73	SVM
PTB	HB	2018	Soybeans	GroupA-0182	0.79	0.06	0.62	0.00	1152.69	22.10	289	184	105	SVM
BS	HB	2018	Soybeans	GroupA-0183	1.23	0.03	1.00	0.00	3100.07	34.32	752	184	568	SVM
AM	HB	2019	Soybeans	GroupA-0184	1.09	0.04	0.80	0.01	1351.32	58.26	745	174	571	SVM
CF	HB	2019	Soybeans	GroupA-0185	1.45	0.18	1.16	0.01	1609.48	77.05	1095	174	921	SVM
PB	HB	2019	Soybeans	GroupA-0186	0.92	0.04	0.80	0.00	2853.21	48.88	278	174	104	SVM
PTB	HB	2019	Soybeans	GroupA-0189	1.03	0.00	0.90	0.00	1152.69	55.09	270	174	96	SVM
PL	HB	2019	Soybeans	GroupA-0190	1.47	0.20	1.26	0.01	1056.49	78.46	968	174	794	SVM
PLB	HB	2019	Soybeans	GroupA-0191	1.18	0.12	0.96	0.00	1650.52	62.61	502	174	328	SVM
JL	HB	2019	Soybeans	GroupA-0192	1.06	0.00	0.88	0.01	30527.42	56.34	888	174	714	SVM
6	HB	2020	Soybeans	GroupA-0193	1.01	0.00	0.81	0.00	593.20	31.47	247	555	-308	SVM
AM	HB	2020	Soybeans	GroupA-0194	1.36	0.08	1.00	0.01	1351.32	42.36	991	555	436	SVM
NH	HB	2020	Soybeans	GroupA-0195	1.22	0.12	1.08	0.00	2580.18	37.98	181	555	-374	SVM
PTB	HB	2020	Soybeans	GroupA-0196	1.97	0.07	1.72	0.00	1152.69	61.23	262	555	-293	SVM
BG	HB	2020	Soybeans	GroupA-0197	1.35	0.06	1.00	0.02	4415.29	42.07	1436	555	881	SVM
BBEA	HB	2020	Soybeans	GroupA-0198	1.22	0.13	0.96	0.07	4811.25	37.87	3036	555	2481	SVM
BS	HB	2020	Soybeans	GroupA-0199	0.81	0.39	0.66	0.00	3100.07	25.05	748	555	193	SVM
6	HB	2021	Soybeans	GroupA-0200	0.76	0.00	0.59	0.00	593.20	21.10	246	363	-117	SVM
AM	HB	2021	Soybeans	GroupA-0201	0.74	0.02	0.56	0.02	1351.32	20.28	1730	363	1367	SVM
CF	HB	2021	Soybeans	GroupA-0202	1.16	0.05	0.98	0.01	1609.48	31.97	1090	363	727	SVM
NH	HB	2021	Soybeans	GroupA-0203	1.63	0.01	1.52	0.00	2580.18	45.06	51	363	-312	SVM
PB	HB	2021	Soybeans	GroupA-0204	0.98	0.04	0.80	0.00	2853.21	26.96	246	363	-117	SVM
PE	HB	2021	Soybeans	GroupA-0205	1.85	0.00	1.70	0.01	3020.77	50.95	938	363	575	SVM
PW	HB	2021	Soybeans	GroupA-0206	1.16	0.12	1.01	0.00	2989.69	32.05	246	363	-117	SVM
PTB	HB	2021	Soybeans	GroupA-0207	2.12	0.00	1.98	0.00	1152.69	58.41	251	363	-112	SVM
PL	HB	2021	Soybeans	GroupA-0208	1.09	0.01	0.90	0.01	1056.49	30.03	978	363	615	SVM
PLB	HB	2021	Soybeans	GroupA-0209	1.77	0.10	1.51	0.00	1650.52	48.80	491	363	128	SVM
JL	HB	2021	Soybeans	GroupA-0210	1.12	0.05	0.97	0.01	30527.42	31.02	884	363	521	SVM
BS	HB	2021	Soybeans	GroupA-0211	2.84	0.01	2.76	0.00	3100.07	78.23	85	363	-278	SVM
6	NH	2013	Soybeans	GroupA-0212	1.67	0.28	1.17	0.00	2271.12	66.88	249	173	76	SVM
AM	NH	2013	Soybeans	GroupA-0213	1.43	0.03	1.00	0.02	1283.59	57.23	1748	173	1575	SVM
HB	NH	2013	Soybeans	GroupA-0214	1.30	0.00	0.93	0.00	2580.18	52.12	558	173	385	SVM
PTB	NH	2013	Soybeans	GroupA-0215	1.54	0.12	1.06	0.00	3164.44	61.77	289	173	116	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BG	NH	2013	Soybeans	GroupA-0216	1.96	0.07	1.59	0.01	4995.12	78.63	1438	173	1265	SVM
BBEA	NH	2013	Soybeans	GroupA-0217	1.54	0.01	1.04	0.07	5431.98	61.86	3081	173	2908	SVM
AA	NH	2013	Soybeans	GroupA-0218	1.93	0.23	1.74	0.00	30478.82	77.52	378	173	205	SVM
SP	NH	2013	Soybeans	GroupA-0219	2.05	0.07	1.82	0.03	32824.38	82.04	1994	173	1821	SVM
BS	NH	2013	Soybeans	GroupA-0220	1.07	0.30	0.81	0.00	5253.94	43.05	656	173	483	SVM
6	NH	2020	Soybeans	GroupA-0221	1.20	0.08	0.93	0.00	2271.12	36.95	247	181	66	SVM
AM	NH	2020	Soybeans	GroupA-0222	1.46	0.20	1.08	0.01	1283.59	45.06	991	181	810	SVM
HB	NH	2020	Soybeans	GroupA-0223	1.13	0.16	0.81	0.00	2580.18	34.65	555	181	374	SVM
PTB	NH	2020	Soybeans	GroupA-0224	1.89	0.00	1.71	0.00	3164.44	58.24	262	181	81	SVM
BG	NH	2020	Soybeans	GroupA-0225	1.57	0.01	1.08	0.01	4995.12	48.28	1436	181	1255	SVM
BBEA	NH	2020	Soybeans	GroupA-0226	1.19	0.10	0.84	0.06	5431.98	36.50	3036	181	2855	SVM
BS	NH	2020	Soybeans	GroupA-0227	0.90	0.47	0.69	0.00	5253.94	27.85	748	181	567	SVM
6	NH	2021	Soybeans	GroupA-0228	1.29	0.03	0.99	0.00	2271.12	51.08	246	51	195	SVM
AM	NH	2021	Soybeans	GroupA-0229	0.92	0.34	0.68	0.02	1283.59	36.37	1730	51	1679	SVM
CF	NH	2021	Soybeans	GroupA-0230	2.49	0.50	2.40	0.01	4061.52	98.30	1090	51	1039	SVM
HB	NH	2021	Soybeans	GroupA-0231	1.59	0.00	1.33	0.00	2580.18	62.56	363	51	312	SVM
PB	NH	2021	Soybeans	GroupA-0232	1.04	0.07	0.73	0.00	4911.94	41.00	246	51	195	SVM
PW	NH	2021	Soybeans	GroupA-0234	2.52	0.36	2.40	0.00	5399.77	99.52	246	51	195	SVM
PTB	NH	2021	Soybeans	GroupA-0235	1.14	0.01	1.04	0.00	3164.44	44.92	251	51	200	SVM
PL	NH	2021	Soybeans	GroupA-0236	1.54	0.08	1.22	0.01	2690.61	60.58	978	51	927	SVM
PLB	NH	2021	Soybeans	GroupA-0237	1.15	0.02	0.90	0.00	3474.91	45.43	491	51	440	SVM
JL	NH	2021	Soybeans	GroupA-0238	1.80	0.15	1.38	0.01	31398.77	71.07	884	51	833	SVM
BS	NH	2021	Soybeans	GroupA-0239	2.08	0.14	1.90	0.00	5253.94	82.17	85	51	34	SVM
CF	PB	2012	Soybeans	GroupA-0240	1.25	0.06	0.89	0.01	1477.63	39.29	1099	335	764	SVM
PL	PB	2012	Soybeans	GroupA-0241	1.19	0.00	0.83	0.01	2233.71	37.34	855	335	520	SVM
PLB	PB	2012	Soybeans	GroupA-0242	1.08	0.03	0.82	0.00	1437.03	33.88	502	335	167	SVM
CS	PB	2012	Soybeans	GroupA-0243	1.22	0.01	0.90	0.03	31668.37	38.09	1942	335	1607	SVM
SP	PB	2012	Soybeans	GroupA-0244	1.41	0.01	1.26	0.02	34025.37	44.14	1929	335	1594	SVM
6	PB	2014	Soybeans	GroupA-0245	1.38	0.06	0.98	0.00	2775.62	39.52	250	334	-84	SVM
AM	PB	2014	Soybeans	GroupA-0246	1.11	0.01	0.93	0.02	3991.90	31.92	1748	334	1414	SVM
HB	PB	2014	Soybeans	GroupA-0247	1.46	0.02	1.12	0.00	2853.21	41.96	555	334	221	SVM
PTB	PB	2014	Soybeans	GroupA-0248	1.28	0.02	1.14	0.00	3582.30	36.65	299	334	-35	SVM
PL	PB	2014	Soybeans	GroupA-0249	1.30	0.05	0.92	0.01	2233.71	37.27	974	334	640	SVM
PLB	PB	2014	Soybeans	GroupA-0250	1.16	0.05	0.81	0.00	1437.03	33.33	500	334	166	SVM
BG	PB	2014	Soybeans	GroupA-0251	1.86	0.02	1.68	0.01	3001.92	53.25	1438	334	1104	SVM
BBEA	PB	2014	Soybeans	GroupA-0252	1.39	0.11	1.22	0.06	3203.03	39.94	3084	334	2750	SVM
SP	PB	2014	Soybeans	GroupA-0253	2.06	0.07	1.88	0.03	34025.37	59.12	1993	334	1659	SVM
BS	PB	2014	Soybeans	GroupA-0254	1.70	0.00	1.52	0.00	4411.96	48.65	656	334	322	SVM
6	PB	2015	Soybeans	GroupA-0255	1.01	0.06	0.79	0.00	2775.62	50.14	251	327	-76	SVM
AM	PB	2015	Soybeans	GroupA-0256	1.00	0.00	0.87	0.01	3991.90	49.50	1467	327	1140	SVM
CF	PB	2015	Soybeans	GroupA-0257	1.31	0.01	1.09	0.01	1477.63	64.78	1097	327	770	SVM
HB	PB	2015	Soybeans	GroupA-0258	0.87	0.01	0.68	0.00	2853.21	43.22	549	327	222	SVM
PTB	PB	2015	Soybeans	GroupA-0259	0.84	0.02	0.72	0.00	3582.30	41.37	303	327	-24	SVM
PL	PB	2015	Soybeans	GroupA-0260	1.80	0.00	1.60	0.01	2233.71	89.02	905	327	578	SVM
PLB	PB	2015	Soybeans	GroupA-0261	0.83	0.05	0.63	0.00	1437.03	40.94	499	327	172	SVM
BG	PB	2015	Soybeans	GroupA-0262	1.46	0.01	1.32	0.01	3001.92	72.20	1384	327	1057	SVM
BBEA	PB	2015	Soybeans	GroupA-0263	1.06	0.00	0.91	0.06	3203.03	52.43	2811	327	2484	SVM
BS	PB	2015	Soybeans	GroupA-0264	0.93	0.00	0.80	0.00	4411.96	46.17	659	327	332	SVM
CF	PB	2016	Soybeans	GroupA-0265	1.23	0.00	0.97	0.01	1477.63	47.07	1083	331	752	SVM
HB	PB	2016	Soybeans	GroupA-0266	0.90	0.02	0.67	0.00	2853.21	34.56	181	331	-150	SVM
PTB	PB	2016	Soybeans	GroupA-0267	1.40	0.01	1.13	0.00	3582.30	53.81	297	331	-34	SVM
BS	PB	2016	Soybeans	GroupA-0268	1.16	0.00	1.02	0.00	4411.96	44.48	655	331	324	SVM
HB	PB	2018	Soybeans	GroupA-0269	1.42	0.00	1.07	0.00	2853.21	49.48	184	327	-143	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PE	PB	2018	Soybeans	GroupA-0270	1.94	0.01	1.53	0.01	573.60	67.45	941	327	614	SVM
PW	PB	2018	Soybeans	GroupA-0271	2.33	0.02	1.97	0.00	1133.42	80.99	257	327	-70	SVM
PTB	PB	2018	Soybeans	GroupA-0272	1.67	0.05	1.26	0.00	3582.30	57.99	289	327	-38	SVM
BS	PB	2018	Soybeans	GroupA-0273	1.38	0.04	1.19	0.00	4411.96	47.95	752	327	425	SVM
AM	PB	2019	Soybeans	GroupA-0274	1.02	0.01	0.81	0.01	3991.90	50.13	745	278	467	SVM
CF	PB	2019	Soybeans	GroupA-0275	1.50	0.00	1.18	0.01	1477.63	73.76	1095	278	817	SVM
HB	PB	2019	Soybeans	GroupA-0276	1.08	0.00	0.84	0.00	2853.21	53.46	174	278	-104	SVM
PE	PB	2019	Soybeans	GroupA-0277	1.34	0.39	1.09	0.01	573.60	65.99	942	278	664	SVM
PW	PB	2019	Soybeans	GroupA-0278	1.65	0.10	1.38	0.00	1133.42	81.58	259	278	-19	SVM
PTB	PB	2019	Soybeans	GroupA-0279	1.27	0.09	1.03	0.00	3582.30	62.58	270	278	-8	SVM
PLB	PB	2019	Soybeans	GroupA-0281	1.75	0.02	1.46	0.00	1437.03	86.45	502	278	224	SVM
JL	PB	2019	Soybeans	GroupA-0282	1.04	0.07	0.82	0.01	32178.80	51.21	888	278	610	SVM
6	PB	2021	Soybeans	GroupA-0283	1.80	0.08	1.50	0.00	2775.62	64.20	246	246	0	SVM
AM	PB	2021	Soybeans	GroupA-0284	1.62	0.03	1.39	0.02	3991.90	57.82	1730	246	1484	SVM
CF	PB	2021	Soybeans	GroupA-0285	2.16	0.10	1.81	0.01	1477.63	76.85	1090	246	844	SVM
HB	PB	2021	Soybeans	GroupA-0286	1.81	0.01	1.56	0.00	2853.21	64.53	363	246	117	SVM
NH	PB	2021	Soybeans	GroupA-0287	1.80	0.01	1.53	0.00	4911.94	64.00	51	246	-195	SVM
PE	PB	2021	Soybeans	GroupA-0288	2.08	0.11	1.70	0.01	573.60	74.28	938	246	692	SVM
PW	PB	2021	Soybeans	GroupA-0289	2.18	0.09	1.76	0.00	1133.42	77.76	246	246	0	SVM
PTB	PB	2021	Soybeans	GroupA-0290	2.13	0.06	1.76	0.00	3582.30	76.07	251	246	5	SVM
PLB	PB	2021	Soybeans	GroupA-0292	2.11	0.13	1.70	0.00	1437.03	75.15	491	246	245	SVM
JL	PB	2021	Soybeans	GroupA-0293	2.73	0.17	2.23	0.01	32178.80	97.26	884	246	638	SVM
BS	PB	2021	Soybeans	GroupA-0294	2.57	0.01	2.08	0.00	4411.96	91.49	85	246	-161	SVM
HB	PE	2018	Soybeans	GroupA-0295	1.38	0.00	1.24	0.00	3020.77	29.56	184	941	-757	SVM
PB	PE	2018	Soybeans	GroupA-0296	2.20	0.00	2.06	0.00	573.60	47.37	327	941	-614	SVM
PW	PE	2018	Soybeans	GroupA-0297	0.66	0.00	0.53	0.00	602.45	14.08	257	941	-684	SVM
PTB	PE	2018	Soybeans	GroupA-0298	1.09	0.01	0.94	0.00	3583.16	23.47	289	941	-652	SVM
BS	PE	2018	Soybeans	GroupA-0299	1.74	0.00	1.59	0.00	4129.23	37.37	752	941	-189	SVM
AM	PE	2019	Soybeans	GroupA-0300	1.36	0.12	1.21	0.00	4256.93	38.71	745	942	-197	SVM
CF	PE	2019	Soybeans	GroupA-0301	0.71	0.01	0.57	0.01	1470.34	20.22	1095	942	153	SVM
HB	PE	2019	Soybeans	GroupA-0302	1.59	0.01	1.40	0.00	3020.77	45.34	174	942	-768	SVM
PB	PE	2019	Soybeans	GroupA-0303	1.69	0.03	1.54	0.00	573.60	48.16	278	942	-664	SVM
PW	PE	2019	Soybeans	GroupA-0304	0.62	0.15	0.48	0.00	602.45	17.57	259	942	-683	SVM
PTB	PE	2019	Soybeans	GroupA-0305	2.56	0.00	2.44	0.00	3583.16	73.21	270	942	-672	SVM
PL	PE	2019	Soybeans	GroupA-0306	0.87	0.05	0.72	0.01	2576.96	24.85	968	942	26	SVM
PLB	PE	2019	Soybeans	GroupA-0307	0.84	0.09	0.71	0.00	1832.05	23.96	502	942	-440	SVM
JL	PE	2019	Soybeans	GroupA-0308	1.48	0.05	1.34	0.01	31805.51	42.31	888	942	-54	SVM
6	PE	2021	Soybeans	GroupA-0309	1.61	0.00	1.44	0.00	3050.40	34.10	246	938	-692	SVM
AM	PE	2021	Soybeans	GroupA-0310	2.17	0.13	1.98	0.02	4256.93	46.13	1730	938	792	SVM
CF	PE	2021	Soybeans	GroupA-0311	1.24	0.00	0.93	0.01	1470.34	26.23	1090	938	152	SVM
HB	PE	2021	Soybeans	GroupA-0312	1.37	0.09	1.19	0.00	3020.77	29.02	363	938	-575	SVM
NH	PE	2021	Soybeans	GroupA-0313	2.85	0.08	2.68	0.00	5265.97	60.50	51	938	-887	SVM
PB	PE	2021	Soybeans	GroupA-0314	1.78	0.07	1.54	0.00	573.60	37.77	246	938	-692	SVM
PW	PE	2021	Soybeans	GroupA-0315	1.26	0.01	1.04	0.00	602.45	26.84	246	938	-692	SVM
PTB	PE	2021	Soybeans	GroupA-0316	3.44	0.04	3.26	0.00	3583.16	73.02	251	938	-687	SVM
PL	PE	2021	Soybeans	GroupA-0317	1.49	0.12	1.23	0.01	2576.96	31.63	978	938	40	SVM
PLB	PE	2021	Soybeans	GroupA-0318	2.01	0.08	1.76	0.00	1832.05	42.76	491	938	-447	SVM
JL	PE	2021	Soybeans	GroupA-0319	1.20	0.01	0.95	0.01	31805.51	25.48	884	938	-54	SVM
BS	PE	2021	Soybeans	GroupA-0320	4.13	0.00	3.97	0.00	4129.23	87.73	85	938	-853	SVM
HB	PW	2018	Soybeans	GroupA-0321	1.18	0.17	1.02	0.00	2989.69	25.72	184	257	-73	SVM
PB	PW	2018	Soybeans	GroupA-0322	2.28	0.10	2.20	0.00	1133.42	49.79	327	257	70	SVM
PE	PW	2018	Soybeans	GroupA-0323	0.81	0.11	0.62	0.01	602.45	17.80	941	257	684	SVM
PTB	PW	2018	Soybeans	GroupA-0324	0.98	0.04	0.86	0.00	3360.13	21.54	289	257	32	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BS	PW	2018	Soybeans	GroupA-0325	1.08	0.08	0.96	0.01	3638.27	23.62	752	257	495	SVM
AM	PW	2019	Soybeans	GroupA-0326	1.40	0.06	1.28	0.01	4299.79	38.65	745	259	486	SVM
CF	PW	2019	Soybeans	GroupA-0327	0.59	0.01	0.46	0.01	1380.51	16.40	1095	259	836	SVM
HB	PW	2019	Soybeans	GroupA-0328	1.95	0.01	1.86	0.00	2989.69	53.87	174	259	-85	SVM
PB	PW	2019	Soybeans	GroupA-0329	1.89	0.00	1.82	0.00	1133.42	52.38	278	259	19	SVM
PE	PW	2019	Soybeans	GroupA-0330	0.58	0.01	0.45	0.01	602.45	15.98	942	259	683	SVM
PTB	PW	2019	Soybeans	GroupA-0331	2.83	0.01	2.78	0.00	3360.13	78.44	270	259	11	SVM
PL	PW	2019	Soybeans	GroupA-0332	0.79	0.00	0.66	0.01	2757.07	21.86	968	259	709	SVM
PLB	PW	2019	Soybeans	GroupA-0333	0.72	0.01	0.60	0.00	2110.84	19.98	502	259	243	SVM
JL	PW	2019	Soybeans	GroupA-0334	1.40	0.01	1.31	0.01	31235.93	38.78	888	259	629	SVM
6	PW	2021	Soybeans	GroupA-0335	0.91	0.01	0.73	0.00	3135.13	20.78	246	246	0	SVM
AM	PW	2021	Soybeans	GroupA-0336	1.23	0.00	1.00	0.02	4299.79	28.00	1730	246	1484	SVM
CF	PW	2021	Soybeans	GroupA-0337	0.84	0.00	0.67	0.01	1380.51	19.23	1090	246	844	SVM
HB	PW	2021	Soybeans	GroupA-0338	0.72	0.02	0.57	0.00	2989.69	16.39	363	246	117	SVM
NH	PW	2021	Soybeans	GroupA-0339	2.35	0.00	2.24	0.00	5399.77	53.48	51	246	-195	SVM
PB	PW	2021	Soybeans	GroupA-0340	1.44	0.00	1.27	0.00	1133.42	32.89	246	246	0	SVM
PE	PW	2021	Soybeans	GroupA-0341	1.41	0.04	1.23	0.01	602.45	32.00	938	246	692	SVM
PTB	PW	2021	Soybeans	GroupA-0342	2.96	0.01	2.86	0.00	3360.13	67.33	251	246	5	SVM
PL	PW	2021	Soybeans	GroupA-0343	0.73	0.02	0.57	0.01	2757.07	16.61	978	246	732	SVM
PLB	PW	2021	Soybeans	GroupA-0344	1.57	0.00	1.37	0.00	2110.84	35.75	491	246	245	SVM
JL	PW	2021	Soybeans	GroupA-0345	0.79	0.01	0.65	0.01	31235.93	18.04	884	246	638	SVM
BS	PW	2021	Soybeans	GroupA-0346	3.58	0.00	3.51	0.00	3638.27	81.56	85	246	-161	SVM
6	PTB	2013	Soybeans	GroupA-0347	0.63	0.00	0.51	0.00	1728.12	17.37	249	289	-40	SVM
AM	PTB	2013	Soybeans	GroupA-0348	1.51	0.02	1.25	0.02	1901.85	41.53	1748	289	1459	SVM
HB	PTB	2013	Soybeans	GroupA-0349	1.12	0.00	1.01	0.00	1152.69	30.83	558	289	269	SVM
NH	PTB	2013	Soybeans	GroupA-0350	1.92	0.07	1.83	0.00	3164.44	52.84	173	289	-116	SVM
BG	PTB	2013	Soybeans	GroupA-0351	0.68	0.16	0.52	0.02	5528.32	18.71	1438	289	1149	SVM
BBEA	PTB	2013	Soybeans	GroupA-0352	0.98	0.11	0.86	0.07	5911.78	27.02	3081	289	2792	SVM
AA	PTB	2013	Soybeans	GroupA-0353	2.85	0.27	2.75	0.00	28506.53	78.26	378	289	89	SVM
SP	PTB	2013	Soybeans	GroupA-0354	2.79	0.03	2.73	0.02	31037.05	76.65	1994	289	1705	SVM
BS	PTB	2013	Soybeans	GroupA-0355	1.54	0.06	1.35	0.00	2114.72	42.37	656	289	367	SVM
6	PTB	2014	Soybeans	GroupA-0356	1.33	0.00	1.07	0.00	1728.12	39.51	250	299	-49	SVM
AM	PTB	2014	Soybeans	GroupA-0357	0.98	0.05	0.86	0.02	1901.85	29.13	1748	299	1449	SVM
HB	PTB	2014	Soybeans	GroupA-0358	1.18	0.01	0.92	0.00	1152.69	35.18	555	299	256	SVM
PB	PTB	2014	Soybeans	GroupA-0359	1.07	0.02	0.91	0.00	3582.30	32.00	334	299	35	SVM
PL	PTB	2014	Soybeans	GroupA-0360	1.34	0.00	1.07	0.01	2192.01	40.01	974	299	675	SVM
PLB	PTB	2014	Soybeans	GroupA-0361	1.35	0.04	1.10	0.00	2652.61	40.16	500	299	201	SVM
BG	PTB	2014	Soybeans	GroupA-0362	1.69	0.01	1.50	0.02	5528.32	50.46	1438	299	1139	SVM
BBEA	PTB	2014	Soybeans	GroupA-0363	1.35	0.04	1.20	0.07	5911.78	40.34	3084	299	2785	SVM
SP	PTB	2014	Soybeans	GroupA-0364	1.47	0.08	1.33	0.03	31037.05	43.79	1993	299	1694	SVM
BS	PTB	2014	Soybeans	GroupA-0365	2.03	0.02	1.81	0.00	2114.72	60.50	656	299	357	SVM
6	PTB	2015	Soybeans	GroupA-0366	1.15	0.03	0.97	0.00	1728.12	65.55	251	303	-52	SVM
AM	PTB	2015	Soybeans	GroupA-0367	0.73	0.00	0.60	0.02	1901.85	41.40	1467	303	1164	SVM
CF	PTB	2015	Soybeans	GroupA-0368	1.29	0.04	1.16	0.01	2125.67	73.72	1097	303	794	SVM
HB	PTB	2015	Soybeans	GroupA-0369	0.95	0.07	0.79	0.00	1152.69	53.95	549	303	246	SVM
PB	PTB	2015	Soybeans	GroupA-0370	1.04	0.02	0.79	0.00	3582.30	59.10	327	303	24	SVM
PL	PTB	2015	Soybeans	GroupA-0371	1.56	0.00	1.34	0.01	2192.01	88.67	905	303	602	SVM
PLB	PTB	2015	Soybeans	GroupA-0372	1.01	0.00	0.82	0.00	2652.61	57.55	499	303	196	SVM
BG	PTB	2015	Soybeans	GroupA-0373	1.11	0.00	0.93	0.01	5528.32	63.23	1384	303	1081	SVM
BBEA	PTB	2015	Soybeans	GroupA-0374	0.97	0.03	0.81	0.06	5911.78	55.48	2811	303	2508	SVM
BS	PTB	2015	Soybeans	GroupA-0375	1.07	0.04	0.91	0.00	2114.72	61.10	659	303	356	SVM
CF	PTB	2016	Soybeans	GroupA-0376	0.69	0.00	0.54	0.01	2125.67	23.89	1083	297	786	SVM
HB	PTB	2016	Soybeans	GroupA-0377	0.53	0.06	0.42	0.00	1152.69	18.25	181	297	-116	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PB	PTB	2016	Soybeans	GroupA-0378	0.94	0.02	0.81	0.00	3582.30	32.58	331	297	34	SVM
BS	PTB	2016	Soybeans	GroupA-0379	1.15	0.00	1.04	0.00	2114.72	39.81	655	297	358	SVM
HB	PTB	2018	Soybeans	GroupA-0380	0.80	0.00	0.67	0.00	1152.69	19.98	184	289	-105	SVM
PB	PTB	2018	Soybeans	GroupA-0381	1.60	0.00	1.41	0.00	3582.30	39.88	327	289	38	SVM
PE	PTB	2018	Soybeans	GroupA-0382	0.91	0.00	0.72	0.01	3583.16	22.59	941	289	652	SVM
PW	PTB	2018	Soybeans	GroupA-0383	0.96	0.00	0.78	0.00	3360.13	23.97	257	289	-32	SVM
BS	PTB	2018	Soybeans	GroupA-0384	1.26	0.00	1.08	0.00	2114.72	31.32	752	289	463	SVM
AM	PTB	2019	Soybeans	GroupA-0385	1.31	0.03	1.10	0.01	1901.85	92.98	745	270	475	SVM
PB	PTB	2019	Soybeans	GroupA-0388	0.85	0.01	0.67	0.00	3582.30	59.87	278	270	8	SVM
JL	PTB	2019	Soybeans	GroupA-0393	1.01	0.01	0.80	0.01	29375.83	71.17	888	270	618	SVM
6	PTB	2020	Soybeans	GroupA-0394	1.80	0.00	1.68	0.00	1728.12	97.65	247	262	-15	SVM
HB	PTB	2020	Soybeans	GroupA-0396	1.39	0.01	1.20	0.00	1152.69	75.39	555	262	293	SVM
NH	PTB	2020	Soybeans	GroupA-0397	1.03	0.10	0.85	0.00	3164.44	55.73	181	262	-81	SVM
BS	PTB	2020	Soybeans	GroupA-0400	1.11	0.05	0.94	0.00	2114.72	59.85	748	262	486	SVM
AM	PTB	2021	Soybeans	GroupA-0402	1.40	0.00	1.16	0.02	1901.85	72.13	1730	251	1479	SVM
HB	PTB	2021	Soybeans	GroupA-0404	1.87	0.07	1.69	0.00	1152.69	96.59	363	251	112	SVM
NH	PTB	2021	Soybeans	GroupA-0405	0.81	0.01	0.68	0.00	3164.44	41.67	51	251	-200	SVM
PB	PTB	2021	Soybeans	GroupA-0406	1.59	0.05	1.27	0.00	3582.30	82.07	246	251	-5	SVM
BS	PTB	2021	Soybeans	GroupA-0412	1.46	0.02	1.26	0.00	2114.72	75.40	85	251	-166	SVM
CF	PL	2012	Soybeans	GroupA-0413	0.75	0.02	0.57	0.01	1531.30	20.87	1099	855	244	SVM
PB	PL	2012	Soybeans	GroupA-0414	0.98	0.00	0.82	0.00	2233.71	27.25	335	855	-520	SVM
PLB	PL	2012	Soybeans	GroupA-0415	0.63	0.03	0.50	0.00	809.82	17.60	502	855	-353	SVM
CS	PL	2012	Soybeans	GroupA-0416	0.89	0.03	0.68	0.03	30903.15	24.80	1942	855	1087	SVM
SP	PL	2012	Soybeans	GroupA-0417	1.46	0.00	1.25	0.03	33228.68	40.52	1929	855	1074	SVM
6	PL	2014	Soybeans	GroupA-0418	0.81	0.02	0.63	0.00	632.74	20.52	250	974	-724	SVM
AM	PL	2014	Soybeans	GroupA-0419	0.87	0.03	0.70	0.02	1797.09	22.07	1748	974	774	SVM
HB	PL	2014	Soybeans	GroupA-0420	1.40	0.03	1.22	0.00	1056.49	35.28	555	974	-419	SVM
PB	PL	2014	Soybeans	GroupA-0421	1.27	0.05	1.12	0.00	2233.71	32.02	334	974	-640	SVM
PTB	PL	2014	Soybeans	GroupA-0422	1.23	0.00	1.07	0.00	2192.01	30.93	299	974	-675	SVM
PLB	PL	2014	Soybeans	GroupA-0423	0.85	0.01	0.66	0.00	809.82	21.46	500	974	-474	SVM
BG	PL	2014	Soybeans	GroupA-0424	2.12	0.01	1.99	0.02	3360.23	53.56	1438	974	464	SVM
BBEA	PL	2014	Soybeans	GroupA-0425	2.27	0.01	2.10	0.07	3759.77	57.19	3084	974	2110	SVM
SP	PL	2014	Soybeans	GroupA-0426	2.37	0.06	2.26	0.03	33228.68	59.84	1993	974	1019	SVM
BS	PL	2014	Soybeans	GroupA-0427	2.10	0.01	1.94	0.00	3972.53	53.13	656	974	-318	SVM
6	PL	2015	Soybeans	GroupA-0428	0.76	0.01	0.58	0.00	632.74	26.06	251	905	-654	SVM
AM	PL	2015	Soybeans	GroupA-0429	1.41	0.02	1.21	0.02	1797.09	48.22	1467	905	562	SVM
CF	PL	2015	Soybeans	GroupA-0430	0.78	0.00	0.62	0.01	1531.30	26.52	1097	905	192	SVM
HB	PL	2015	Soybeans	GroupA-0431	1.95	0.05	1.80	0.00	1056.49	66.39	549	905	-356	SVM
PB	PL	2015	Soybeans	GroupA-0432	1.18	0.04	0.99	0.00	2233.71	40.34	327	905	-578	SVM
PTB	PL	2015	Soybeans	GroupA-0433	1.27	0.01	1.06	0.00	2192.01	43.28	303	905	-602	SVM
PLB	PL	2015	Soybeans	GroupA-0434	0.86	0.01	0.65	0.00	809.82	29.35	499	905	-406	SVM
BG	PL	2015	Soybeans	GroupA-0435	1.87	0.02	1.73	0.01	3360.23	63.76	1384	905	479	SVM
BBEA	PL	2015	Soybeans	GroupA-0436	2.16	0.12	2.05	0.06	3759.77	73.49	2811	905	1906	SVM
BS	PL	2015	Soybeans	GroupA-0437	1.85	0.01	1.70	0.00	3972.53	62.98	659	905	-246	SVM
AM	PL	2019	Soybeans	GroupA-0438	1.01	0.00	0.82	0.01	1797.09	31.44	745	968	-223	SVM
CF	PL	2019	Soybeans	GroupA-0439	0.80	0.01	0.65	0.01	1531.30	24.89	1095	968	127	SVM
HB	PL	2019	Soybeans	GroupA-0440	1.64	0.12	1.51	0.00	1056.49	50.93	174	968	-794	SVM
PB	PL	2019	Soybeans	GroupA-0441	1.35	0.01	1.20	0.00	2233.71	41.77	278	968	-690	SVM
PE	PL	2019	Soybeans	GroupA-0442	0.89	0.04	0.72	0.01	2576.96	27.71	942	968	-26	SVM
PW	PL	2019	Soybeans	GroupA-0443	0.84	0.07	0.65	0.00	2757.07	25.94	259	968	-709	SVM
PTB	PL	2019	Soybeans	GroupA-0444	1.72	0.03	1.56	0.00	2192.01	53.32	270	968	-698	SVM
PLB	PL	2019	Soybeans	GroupA-0445	0.65	0.11	0.50	0.00	809.82	20.15	502	968	-466	SVM
JL	PL	2019	Soybeans	GroupA-0446	1.05	0.03	0.92	0.01	31562.14	32.73	888	968	-80	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
6	PL	2021	Soybeans	GroupA-0447	1.17	0.01	0.99	0.00	632.74	25.40	246	978	-732	SVM
AM	PL	2021	Soybeans	GroupA-0448	1.79	0.00	1.53	0.02	1797.09	38.74	1730	978	752	SVM
CF	PL	2021	Soybeans	GroupA-0449	1.05	0.00	0.81	0.01	1531.30	22.73	1090	978	112	SVM
HB	PL	2021	Soybeans	GroupA-0450	1.34	0.00	1.16	0.00	1056.49	29.08	363	978	-615	SVM
NH	PL	2021	Soybeans	GroupA-0451	2.59	0.01	2.47	0.00	2690.61	56.25	51	978	-927	SVM
PB	PL	2021	Soybeans	GroupA-0452	1.62	0.01	1.41	0.00	2233.71	35.05	246	978	-732	SVM
PE	PL	2021	Soybeans	GroupA-0453	1.14	0.01	0.87	0.01	2576.96	24.83	938	978	-40	SVM
PW	PL	2021	Soybeans	GroupA-0454	0.98	0.01	0.80	0.00	2757.07	21.32	246	978	-732	SVM
PTB	PL	2021	Soybeans	GroupA-0455	2.93	0.00	2.80	0.00	2192.01	63.52	251	978	-727	SVM
PLB	PL	2021	Soybeans	GroupA-0456	1.28	0.00	0.99	0.00	809.82	27.80	491	978	-487	SVM
JL	PL	2021	Soybeans	GroupA-0457	0.86	0.00	0.63	0.01	31562.14	18.64	884	978	-94	SVM
BS	PL	2021	Soybeans	GroupA-0458	3.81	0.00	3.72	0.00	3972.53	82.73	85	978	-893	SVM
CF	PLB	2012	Soybeans	GroupA-0459	0.57	0.08	0.46	0.01	1177.89	16.14	1099	502	597	SVM
PB	PLB	2012	Soybeans	GroupA-0460	0.88	0.00	0.77	0.00	1437.03	24.82	335	502	-167	SVM
PL	PLB	2012	Soybeans	GroupA-0461	0.53	0.02	0.41	0.01	809.82	14.78	855	502	353	SVM
CS	PLB	2012	Soybeans	GroupA-0462	1.10	0.08	0.79	0.03	31271.27	31.04	1942	502	1440	SVM
SP	PLB	2012	Soybeans	GroupA-0463	1.55	0.01	1.40	0.03	33608.76	43.58	1929	502	1427	SVM
6	PLB	2014	Soybeans	GroupA-0464	0.99	0.02	0.72	0.00	1403.96	26.09	250	500	-250	SVM
AM	PLB	2014	Soybeans	GroupA-0465	1.02	0.12	0.85	0.02	2601.80	26.89	1748	500	1248	SVM
HB	PLB	2014	Soybeans	GroupA-0466	1.48	0.00	1.27	0.00	1650.52	39.27	555	500	55	SVM
PB	PLB	2014	Soybeans	GroupA-0467	1.22	0.08	1.07	0.00	1437.03	32.36	334	500	-166	SVM
PTB	PLB	2014	Soybeans	GroupA-0468	1.29	0.01	1.14	0.00	2652.61	34.20	299	500	-201	SVM
PL	PLB	2014	Soybeans	GroupA-0469	0.82	0.20	0.62	0.01	809.82	21.79	974	500	474	SVM
BG	PLB	2014	Soybeans	GroupA-0470	1.94	0.01	1.75	0.02	2941.78	51.43	1438	500	938	SVM
BBEA	PLB	2014	Soybeans	GroupA-0471	2.17	0.08	2.01	0.07	3296.50	57.51	3084	500	2584	SVM
SP	PLB	2014	Soybeans	GroupA-0472	2.31	0.09	2.16	0.03	33608.76	61.24	1993	500	1493	SVM
BS	PLB	2014	Soybeans	GroupA-0473	1.87	0.06	1.67	0.00	4109.93	49.62	656	500	156	SVM
6	PLB	2015	Soybeans	GroupA-0474	0.82	0.07	0.63	0.00	1403.96	35.93	251	499	-248	SVM
AM	PLB	2015	Soybeans	GroupA-0475	1.01	0.09	0.84	0.02	2601.80	44.23	1467	499	968	SVM
CF	PLB	2015	Soybeans	GroupA-0476	1.07	0.02	0.82	0.01	1177.89	47.01	1097	499	598	SVM
HB	PLB	2015	Soybeans	GroupA-0477	1.49	0.07	1.29	0.00	1650.52	65.34	549	499	50	SVM
PB	PLB	2015	Soybeans	GroupA-0478	0.80	0.07	0.68	0.00	1437.03	35.11	327	499	-172	SVM
PTB	PLB	2015	Soybeans	GroupA-0479	0.83	0.03	0.72	0.00	2652.61	36.48	303	499	-196	SVM
PL	PLB	2015	Soybeans	GroupA-0480	1.17	0.00	0.90	0.01	809.82	51.45	905	499	406	SVM
BG	PLB	2015	Soybeans	GroupA-0481	1.34	0.01	1.13	0.01	2941.78	58.81	1384	499	885	SVM
BBEA	PLB	2015	Soybeans	GroupA-0482	1.52	0.00	1.32	0.06	3296.50	66.87	2811	499	2312	SVM
BS	PLB	2015	Soybeans	GroupA-0483	1.30	0.05	1.12	0.00	4109.93	57.08	659	499	160	SVM
AM	PLB	2019	Soybeans	GroupA-0484	0.94	0.40	0.78	0.01	2601.80	33.38	745	502	243	SVM
CF	PLB	2019	Soybeans	GroupA-0485	1.15	0.00	0.89	0.01	1177.89	40.92	1095	502	593	SVM
HB	PLB	2019	Soybeans	GroupA-0486	1.50	0.03	1.29	0.00	1650.52	53.51	174	502	-328	SVM
PB	PLB	2019	Soybeans	GroupA-0487	1.27	0.00	1.07	0.00	1437.03	45.41	278	502	-224	SVM
PE	PLB	2019	Soybeans	GroupA-0488	1.28	0.05	1.02	0.01	1832.05	45.55	942	502	440	SVM
PW	PLB	2019	Soybeans	GroupA-0489	1.31	0.02	1.00	0.00	2110.84	46.82	259	502	-243	SVM
PTB	PLB	2019	Soybeans	GroupA-0490	1.57	0.01	1.38	0.00	2652.61	55.87	270	502	-232	SVM
PL	PLB	2019	Soybeans	GroupA-0491	0.89	0.34	0.67	0.01	809.82	31.83	968	502	466	SVM
JL	PLB	2019	Soybeans	GroupA-0492	1.11	0.10	0.99	0.01	31878.96	39.67	888	502	386	SVM
6	PLB	2021	Soybeans	GroupA-0493	1.30	0.05	1.10	0.00	1403.96	31.52	246	491	-245	SVM
AM	PLB	2021	Soybeans	GroupA-0494	1.75	0.13	1.58	0.02	2601.80	42.26	1730	491	1239	SVM
CF	PLB	2021	Soybeans	GroupA-0495	1.43	0.00	1.01	0.01	1177.89	34.46	1090	491	599	SVM
HB	PLB	2021	Soybeans	GroupA-0496	1.39	0.07	1.14	0.00	1650.52	33.55	363	491	-128	SVM
NH	PLB	2021	Soybeans	GroupA-0497	2.35	0.03	2.18	0.00	3474.91	56.86	51	491	-440	SVM
PB	PLB	2021	Soybeans	GroupA-0498	1.56	0.00	1.31	0.00	1437.03	37.81	246	491	-245	SVM
PE	PLB	2021	Soybeans	GroupA-0499	1.52	0.01	1.08	0.01	1832.05	36.82	938	491	447	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PW	PLB	2021	Soybeans	GroupA-0500	1.43	0.02	1.00	0.00	2110.84	34.52	246	491	-245	SVM
PTB	PLB	2021	Soybeans	GroupA-0501	2.66	0.00	2.47	0.00	2652.61	64.24	251	491	-240	SVM
PL	PLB	2021	Soybeans	GroupA-0502	1.41	0.00	0.94	0.01	809.82	34.05	978	491	487	SVM
JL	PLB	2021	Soybeans	GroupA-0503	1.44	0.00	0.97	0.01	31878.96	34.76	884	491	393	SVM
BS	PLB	2021	Soybeans	GroupA-0504	3.55	0.01	3.34	0.00	4109.93	85.82	85	491	-406	SVM
6	BG	2013	Soybeans	GroupA-0505	1.06	0.00	0.83	0.00	3938.74	30.36	249	1438	-1189	SVM
AM	BG	2013	Soybeans	GroupA-0506	1.21	0.02	0.99	0.02	4801.99	34.70	1748	1438	310	SVM
HB	BG	2013	Soybeans	GroupA-0507	1.33	0.10	1.12	0.00	4415.29	38.01	558	1438	-880	SVM
NH	BG	2013	Soybeans	GroupA-0508	2.08	0.05	1.83	0.00	4995.12	59.73	173	1438	-1265	SVM
PTB	BG	2013	Soybeans	GroupA-0509	1.05	0.05	0.84	0.00	5528.32	30.11	289	1438	-1149	SVM
BBEA	BG	2013	Soybeans	GroupA-0510	1.28	0.23	1.08	0.08	438.12	36.66	3081	1438	1643	SVM
AA	BG	2013	Soybeans	GroupA-0511	2.75	0.04	2.54	0.00	33970.15	78.83	378	1438	-1060	SVM
SP	BG	2013	Soybeans	GroupA-0512	2.75	0.01	2.54	0.02	36543.85	78.82	1994	1438	556	SVM
BS	BG	2013	Soybeans	GroupA-0513	1.54	0.00	1.25	0.00	7029.70	44.14	656	1438	-782	SVM
PB	BG	2014	Soybeans	GroupA-0517	1.15	0.00	0.98	0.00	3001.92	65.58	334	1438	-1104	SVM
PTB	BG	2014	Soybeans	GroupA-0518	1.39	0.03	1.20	0.00	5528.32	79.10	299	1438	-1139	SVM
BBEA	BG	2014	Soybeans	GroupA-0521	0.75	0.02	0.61	0.07	438.12	43.01	3084	1438	1646	SVM
SP	BG	2014	Soybeans	GroupA-0522	0.79	0.00	0.64	0.03	36543.85	45.14	1993	1438	555	SVM
BS	BG	2014	Soybeans	GroupA-0523	0.88	0.01	0.72	0.00	7029.70	50.32	656	1438	-782	SVM
HB	BG	2015	Soybeans	GroupA-0527	0.75	0.07	0.60	0.00	4415.29	92.32	549	1384	-835	SVM
BBEA	BG	2015	Soybeans	GroupA-0532	0.54	0.15	0.44	0.06	438.12	66.04	2811	1384	1427	SVM
BS	BG	2015	Soybeans	GroupA-0533	0.71	0.01	0.60	0.00	7029.70	87.26	659	1384	-725	SVM
6	BG	2020	Soybeans	GroupA-0534	0.89	0.00	0.75	0.00	3938.74	23.79	247	1436	-1189	SVM
AM	BG	2020	Soybeans	GroupA-0535	0.95	0.01	0.73	0.01	4801.99	25.28	991	1436	-445	SVM
HB	BG	2020	Soybeans	GroupA-0536	1.23	0.02	1.02	0.00	4415.29	32.88	555	1436	-881	SVM
NH	BG	2020	Soybeans	GroupA-0537	1.42	0.00	1.22	0.00	4995.12	37.82	181	1436	-1255	SVM
PTB	BG	2020	Soybeans	GroupA-0538	2.09	0.00	1.91	0.00	5528.32	55.78	262	1436	-1174	SVM
BBEA	BG	2020	Soybeans	GroupA-0539	0.89	0.06	0.71	0.07	438.12	23.69	3036	1436	1600	SVM
BS	BG	2020	Soybeans	GroupA-0540	1.39	0.00	1.17	0.00	7029.70	37.17	748	1436	-688	SVM
6	BBEA	2013	Soybeans	GroupA-0541	1.17	0.00	0.95	0.00	4348.89	42.55	249	3081	-2832	SVM
AM	BBEA	2013	Soybeans	GroupA-0542	1.07	0.00	0.87	0.02	5233.55	38.93	1748	3081	-1333	SVM
HB	BBEA	2013	Soybeans	GroupA-0543	0.94	0.02	0.76	0.00	4811.25	34.21	558	3081	-2523	SVM
NH	BBEA	2013	Soybeans	GroupA-0544	1.42	0.04	1.17	0.00	5431.98	51.61	173	3081	-2908	SVM
PTB	BBEA	2013	Soybeans	GroupA-0545	1.24	0.00	1.01	0.00	5911.78	44.77	289	3081	-2792	SVM
BG	BBEA	2013	Soybeans	GroupA-0546	1.29	0.11	0.98	0.01	438.12	46.68	1438	3081	-1643	SVM
AA	BBEA	2013	Soybeans	GroupA-0547	2.00	0.00	1.79	0.00	34316.27	72.43	378	3081	-2703	SVM
SP	BBEA	2013	Soybeans	GroupA-0548	2.08	0.00	1.87	0.02	36905.03	75.51	1994	3081	-1087	SVM
BS	BBEA	2013	Soybeans	GroupA-0549	1.08	0.01	0.87	0.00	7352.54	39.05	656	3081	-2425	SVM
AM	BBEA	2014	Soybeans	GroupA-0551	1.74	0.00	1.53	0.02	5233.55	96.19	1748	3084	-1336	SVM
HB	BBEA	2014	Soybeans	GroupA-0552	1.74	0.00	1.45	0.00	4811.25	95.96	555	3084	-2529	SVM
PB	BBEA	2014	Soybeans	GroupA-0553	1.17	0.02	0.97	0.00	3203.03	64.37	334	3084	-2750	SVM
PTB	BBEA	2014	Soybeans	GroupA-0554	1.41	0.00	1.18	0.00	5911.78	77.72	299	3084	-2785	SVM
BG	BBEA	2014	Soybeans	GroupA-0557	0.87	0.01	0.71	0.01	438.12	48.09	1438	3084	-1646	SVM
SP	BBEA	2014	Soybeans	GroupA-0558	0.92	0.00	0.75	0.03	36905.03	50.74	1993	3084	-1091	SVM
BS	BBEA	2014	Soybeans	GroupA-0559	0.87	0.01	0.71	0.00	7352.54	48.16	656	3084	-2428	SVM
HB	BBEA	2015	Soybeans	GroupA-0563	0.70	0.14	0.57	0.00	4811.25	92.42	549	2811	-2262	SVM
BG	BBEA	2015	Soybeans	GroupA-0568	0.60	0.11	0.47	0.01	438.12	79.81	1384	2811	-1427	SVM
BS	BBEA	2015	Soybeans	GroupA-0569	0.73	0.02	0.61	0.00	7352.54	97.50	659	2811	-2152	SVM
6	BBEA	2020	Soybeans	GroupA-0570	0.97	0.00	0.74	0.00	4348.89	28.66	247	3036	-2789	SVM
AM	BBEA	2020	Soybeans	GroupA-0571	1.20	0.00	0.87	0.01	5233.55	35.50	991	3036	-2045	SVM
HB	BBEA	2020	Soybeans	GroupA-0572	1.09	0.00	0.86	0.00	4811.25	32.38	555	3036	-2481	SVM
NH	BBEA	2020	Soybeans	GroupA-0573	1.18	0.01	1.00	0.00	5431.98	35.14	181	3036	-2855	SVM
PTB	BBEA	2020	Soybeans	GroupA-0574	1.81	0.01	1.64	0.00	5911.78	53.81	262	3036	-2774	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BG	BBEA	2020	Soybeans	GroupA-0575	1.18	0.01	0.87	0.01	438.12	34.90	1436	3036	-1600	SVM
BS	BBEA	2020	Soybeans	GroupA-0576	1.16	0.01	0.93	0.00	7352.54	34.52	748	3036	-2288	SVM
RD	AA	2014	Soybeans	GroupA-0579	1.12	0.03	0.87	0.01	28035.93	28.71	1259	3968	-2709	SVM
1P	AA	2019	Soybeans	GroupA-0580	1.15	0.02	0.99	0.00	14966.67	30.00	770	3976	-3206	SVM
2PB	AA	2019	Soybeans	GroupA-0581	0.88	0.02	0.69	0.02	14577.73	22.96	1767	3976	-2209	SVM
1P	AA	2021	Soybeans	GroupA-0582	0.74	0.01	0.59	0.00	14966.67	16.11	770	3966	-3196	SVM
2PB	AA	2021	Soybeans	GroupA-0583	1.54	0.00	1.33	0.02	14577.73	33.45	1771	3966	-2195	SVM
RD	AA	2021	Soybeans	GroupA-0584	1.79	0.00	1.58	0.01	28035.93	38.65	1259	3966	-2707	SVM
RD	CS	2013	Soybeans	GroupA-0585	1.03	0.00	0.85	0.01	28340.32	41.70	1256	2440	-1184	SVM
SP	CS	2020	Soybeans	GroupA-0586	0.94	0.01	0.79	0.03	2392.70	19.58	1984	2437	-453	SVM
MP	CS	2020	Soybeans	GroupA-0587	1.55	0.03	1.42	0.01	10327.57	32.29	954	2437	-1483	SVM
RD	CS	2020	Soybeans	GroupA-0588	1.86	0.00	1.74	0.01	28340.32	38.81	1254	2437	-1183	SVM
AM	JL	2019	Soybeans	GroupA-0589	0.69	0.00	0.57	0.00	30699.89	31.75	745	888	-143	SVM
CF	JL	2019	Soybeans	GroupA-0590	1.27	0.01	1.15	0.01	30895.46	58.46	1095	888	207	SVM
HB	JL	2019	Soybeans	GroupA-0591	0.71	0.05	0.58	0.00	30527.42	32.70	174	888	-714	SVM
PB	JL	2019	Soybeans	GroupA-0592	0.60	0.05	0.47	0.00	32178.80	27.69	278	888	-610	SVM
PE	JL	2019	Soybeans	GroupA-0593	1.55	0.00	1.43	0.01	31805.51	71.43	942	888	54	SVM
PW	JL	2019	Soybeans	GroupA-0594	1.44	0.01	1.35	0.00	31235.93	66.16	259	888	-629	SVM
PTB	JL	2019	Soybeans	GroupA-0595	0.76	0.01	0.61	0.00	29375.83	35.10	270	888	-618	SVM
PL	JL	2019	Soybeans	GroupA-0596	1.20	0.02	1.07	0.01	31562.14	54.92	968	888	80	SVM
PLB	JL	2019	Soybeans	GroupA-0597	0.97	0.00	0.78	0.00	31878.96	44.72	502	888	-386	SVM
6	JL	2021	Soybeans	GroupA-0598	1.21	0.01	1.05	0.00	31086.42	26.72	246	884	-638	SVM
AM	JL	2021	Soybeans	GroupA-0599	2.13	0.00	1.87	0.02	30699.89	46.98	1730	884	846	SVM
CF	JL	2021	Soybeans	GroupA-0600	0.86	0.00	0.68	0.01	30895.46	18.87	1090	884	206	SVM
HB	JL	2021	Soybeans	GroupA-0601	0.97	0.00	0.79	0.00	30527.42	21.42	363	884	-521	SVM
NH	JL	2021	Soybeans	GroupA-0602	2.46	0.02	2.36	0.00	31398.77	54.20	51	884	-833	SVM
PB	JL	2021	Soybeans	GroupA-0603	1.62	0.00	1.46	0.00	32178.80	35.59	246	884	-638	SVM
PE	JL	2021	Soybeans	GroupA-0604	1.14	0.00	0.94	0.01	31805.51	25.09	938	884	54	SVM
PW	JL	2021	Soybeans	GroupA-0605	0.78	0.00	0.63	0.00	31235.93	17.23	246	884	-638	SVM
PTB	JL	2021	Soybeans	GroupA-0606	2.69	0.00	2.58	0.00	29375.83	59.14	251	884	-633	SVM
PL	JL	2021	Soybeans	GroupA-0607	0.83	0.00	0.64	0.01	31562.14	18.20	978	884	94	SVM
PLB	JL	2021	Soybeans	GroupA-0608	1.76	0.01	1.47	0.00	31878.96	38.66	491	884	-393	SVM
BS	JL	2021	Soybeans	GroupA-0609	3.94	0.00	3.88	0.00	27818.58	86.74	85	884	-799	SVM
CS	SP	2013	Soybeans	GroupA-0610	1.01	0.14	0.89	0.04	2392.70	99.29	2440	1994	446	SVM
AA	SP	2014	Soybeans	GroupA-0612	1.17	0.02	0.94	0.11	3305.23	55.40	3968	1993	1975	SVM
RD	SP	2014	Soybeans	GroupA-0613	1.70	0.01	1.50	0.01	30697.43	80.38	1259	1993	-734	SVM
CS	SP	2020	Soybeans	GroupA-0614	0.70	0.05	0.53	0.04	2392.70	16.22	2437	1984	453	SVM
MP	SP	2020	Soybeans	GroupA-0615	1.22	0.03	1.10	0.01	10398.84	28.14	954	1984	-1030	SVM
RD	SP	2020	Soybeans	GroupA-0616	1.43	0.00	1.31	0.01	30697.43	32.88	1254	1984	-730	SVM
AA	1P	2019	Soybeans	GroupA-0617	0.91	0.07	0.70	0.11	14966.67	25.95	3976	770	3206	SVM
2PB	1P	2019	Soybeans	GroupA-0618	0.80	0.25	0.61	0.02	884.63	22.81	1767	770	997	SVM
AA	1P	2021	Soybeans	GroupA-0619	0.69	0.07	0.52	0.11	14966.67	14.50	3966	770	3196	SVM
2PB	1P	2021	Soybeans	GroupA-0620	0.94	0.02	0.75	0.02	884.63	19.63	1771	770	1001	SVM
RD	1P	2021	Soybeans	GroupA-0621	1.22	0.01	0.96	0.01	28988.76	25.58	1259	770	489	SVM
AA	2PB	2019	Soybeans	GroupA-0622	0.98	0.01	0.79	0.11	14577.73	26.80	3976	1767	2209	SVM
1P	2PB	2019	Soybeans	GroupA-0623	1.10	0.03	0.84	0.00	884.63	30.23	770	1767	-997	SVM
AA	2PB	2021	Soybeans	GroupA-0624	0.95	0.01	0.73	0.11	14577.73	22.42	3966	1771	2195	SVM
1P	2PB	2021	Soybeans	GroupA-0625	0.95	0.01	0.74	0.00	884.63	22.45	770	1771	-1001	SVM
RD	2PB	2021	Soybeans	GroupA-0626	1.18	0.02	0.94	0.01	29606.60	27.91	1259	1771	-512	SVM
CS	MP	2020	Soybeans	GroupA-0627	1.10	0.32	0.90	0.04	10327.57	28.54	2437	954	1483	SVM
SP	MP	2020	Soybeans	GroupA-0628	0.83	0.17	0.60	0.03	10398.84	21.68	1984	954	1030	SVM
RD	MP	2020	Soybeans	GroupA-0629	1.00	0.12	0.85	0.01	29241.14	25.96	1254	954	300	SVM
6	BS	2013	Soybeans	GroupA-0630	0.95	0.09	0.70	0.00	3688.53	29.87	249	656	-407	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
AM	BS	2013	Soybeans	GroupA-0631	0.86	0.02	0.68	0.02	4011.02	27.06	1748	656	1092	SVM
HB	BS	2013	Soybeans	GroupA-0632	0.81	0.05	0.67	0.00	3100.07	25.50	558	656	-98	SVM
NH	BS	2013	Soybeans	GroupA-0633	1.46	0.10	1.33	0.00	5253.94	45.82	173	656	-483	SVM
PTB	BS	2013	Soybeans	GroupA-0634	0.93	0.00	0.68	0.00	2114.72	29.31	289	656	-367	SVM
BG	BS	2013	Soybeans	GroupA-0635	1.06	0.02	0.85	0.02	7029.70	33.17	1438	656	782	SVM
BBEA	BS	2013	Soybeans	GroupA-0636	1.24	0.05	1.08	0.08	7352.54	39.12	3081	656	2425	SVM
AA	BS	2013	Soybeans	GroupA-0637	2.38	0.01	2.26	0.00	26984.06	74.82	378	656	-278	SVM
SP	BS	2013	Soybeans	GroupA-0638	2.54	0.01	2.42	0.02	29622.57	79.75	1994	656	1338	SVM
6	BS	2014	Soybeans	GroupA-0639	2.18	0.01	1.95	0.00	3688.53	90.60	250	656	-406	SVM
AM	BS	2014	Soybeans	GroupA-0640	1.71	0.02	1.44	0.02	4011.02	71.27	1748	656	1092	SVM
HB	BS	2014	Soybeans	GroupA-0641	1.23	0.02	0.92	0.00	3100.07	51.12	555	656	-101	SVM
PB	BS	2014	Soybeans	GroupA-0642	1.05	0.00	0.82	0.00	4411.96	43.58	334	656	-322	SVM
PTB	BS	2014	Soybeans	GroupA-0643	1.12	0.01	0.85	0.00	2114.72	46.77	299	656	-357	SVM
PL	BS	2014	Soybeans	GroupA-0644	1.75	0.08	1.49	0.01	3972.53	72.65	974	656	318	SVM
PLB	BS	2014	Soybeans	GroupA-0645	2.03	0.05	1.77	0.00	4109.93	84.35	500	656	-156	SVM
BG	BS	2014	Soybeans	GroupA-0646	1.38	0.01	1.17	0.02	7029.70	57.55	1438	656	782	SVM
BBEA	BS	2014	Soybeans	GroupA-0647	1.35	0.00	1.17	0.07	7352.54	56.00	3084	656	2428	SVM
SP	BS	2014	Soybeans	GroupA-0648	1.40	0.00	1.21	0.03	29622.57	58.40	1993	656	1337	SVM
AM	BS	2015	Soybeans	GroupA-0650	0.87	0.04	0.69	0.01	4011.02	63.26	1467	659	808	SVM
HB	BS	2015	Soybeans	GroupA-0652	0.86	0.01	0.72	0.00	3100.07	62.53	549	659	-110	SVM
PB	BS	2015	Soybeans	GroupA-0653	0.81	0.03	0.65	0.00	4411.96	59.07	327	659	-332	SVM
PTB	BS	2015	Soybeans	GroupA-0654	0.76	0.02	0.61	0.00	2114.72	55.25	303	659	-356	SVM
PL	BS	2015	Soybeans	GroupA-0655	1.32	0.01	1.14	0.01	3972.53	95.65	905	659	246	SVM
BG	BS	2015	Soybeans	GroupA-0657	0.84	0.00	0.69	0.01	7029.70	61.23	1384	659	725	SVM
BBEA	BS	2015	Soybeans	GroupA-0658	0.93	0.03	0.78	0.06	7352.54	67.31	2811	659	2152	SVM
CF	BS	2016	Soybeans	GroupA-0659	1.16	0.04	0.99	0.01	3076.95	45.83	1083	655	428	SVM
HB	BS	2016	Soybeans	GroupA-0660	0.66	0.01	0.56	0.00	3100.07	26.27	181	655	-474	SVM
PB	BS	2016	Soybeans	GroupA-0661	0.68	0.03	0.59	0.00	4411.96	27.04	331	655	-324	SVM
PTB	BS	2016	Soybeans	GroupA-0662	0.71	0.03	0.56	0.00	2114.72	28.15	297	655	-358	SVM
HB	BS	2018	Soybeans	GroupA-0663	0.98	0.00	0.77	0.00	3100.07	25.82	184	752	-568	SVM
PB	BS	2018	Soybeans	GroupA-0664	1.73	0.02	1.56	0.00	4411.96	45.59	327	752	-425	SVM
PE	BS	2018	Soybeans	GroupA-0665	1.25	0.00	0.95	0.01	4129.23	33.10	941	752	189	SVM
PW	BS	2018	Soybeans	GroupA-0666	1.33	0.00	1.03	0.00	3638.27	35.22	257	752	-495	SVM
PTB	BS	2018	Soybeans	GroupA-0667	0.92	0.00	0.70	0.00	2114.72	24.28	289	752	-463	SVM
6	BS	2020	Soybeans	GroupA-0668	0.90	0.00	0.66	0.00	3688.53	26.33	247	748	-501	SVM
AM	BS	2020	Soybeans	GroupA-0669	1.02	0.03	0.76	0.01	4011.02	30.06	991	748	243	SVM
HB	BS	2020	Soybeans	GroupA-0670	0.75	0.24	0.58	0.00	3100.07	21.92	555	748	-193	SVM
NH	BS	2020	Soybeans	GroupA-0671	1.22	0.11	1.07	0.00	5253.94	35.80	181	748	-567	SVM
PTB	BS	2020	Soybeans	GroupA-0672	1.94	0.00	1.77	0.00	2114.72	56.90	262	748	-486	SVM
BG	BS	2020	Soybeans	GroupA-0673	1.09	0.00	0.82	0.02	7029.70	32.11	1436	748	688	SVM
BBEA	BS	2020	Soybeans	GroupA-0674	0.97	0.00	0.77	0.07	7352.54	28.55	3036	748	2288	SVM
PTB	BS	2021	Soybeans	GroupA-0683	0.82	0.00	0.70	0.00	2114.72	76.24	251	85	166	SVM
CS	RD	2013	Soybeans	GroupA-0687	2.04	0.12	1.88	0.04	28340.32	56.47	2440	1256	1184	SVM
AA	RD	2014	Soybeans	GroupA-0688	1.71	0.03	1.48	0.11	28035.93	37.58	3968	1259	2709	SVM
CS	RD	2020	Soybeans	GroupA-0689	1.37	0.07	1.14	0.04	28340.32	37.60	2437	1254	1183	SVM
SP	RD	2020	Soybeans	GroupA-0690	0.98	0.03	0.72	0.03	30697.43	26.87	1984	1254	730	SVM
MP	RD	2020	Soybeans	GroupA-0691	0.83	0.02	0.66	0.01	29241.14	22.77	954	1254	-300	SVM
AA	RD	2021	Soybeans	GroupA-0692	1.45	0.04	1.05	0.11	28035.93	38.02	3966	1259	2707	SVM
1P	RD	2021	Soybeans	GroupA-0693	1.41	0.09	1.00	0.00	28988.76	36.93	770	1259	-489	SVM
2PB	RD	2021	Soybeans	GroupA-0694	2.54	0.15	2.30	0.02	29606.60	66.48	1771	1259	512	SVM
AM	6	2016	Corn	GroupA-0695	1.08	0.10	0.84	0.03	1216.49	11.99	1759	249	1510	SVM
HB	6	2016	Corn	GroupA-0696	1.25	0.00	0.94	0.00	593.20	13.81	366	249	117	SVM
NH	6	2016	Corn	GroupA-0697	1.81	0.04	1.57	0.00	2271.12	20.08	222	249	-27	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PL	6	2016	Corn	GroupA-0698	1.10	0.06	0.84	0.01	632.74	12.23	978	249	729	SVM
PLB	6	2016	Corn	GroupA-0699	1.29	0.01	1.09	0.00	1403.96	14.36	501	249	252	SVM
BG	6	2016	Corn	GroupA-0700	1.38	0.09	1.09	0.02	3938.74	15.25	1426	249	1177	SVM
BBEA	6	2016	Corn	GroupA-0701	1.29	0.04	1.03	0.07	4348.89	14.32	3066	249	2817	SVM
AM	6	2017	Corn	GroupA-0702	2.77	0.00	2.35	0.03	1216.49	22.91	1746	248	1498	SVM
CF	6	2017	Corn	GroupA-0703	2.69	0.05	2.32	0.01	1790.97	22.28	1099	248	851	SVM
HB	6	2017	Corn	GroupA-0704	3.31	0.01	2.73	0.00	593.20	27.37	557	248	309	SVM
NH	6	2017	Corn	GroupA-0705	2.91	0.06	2.45	0.00	2271.12	24.10	226	248	-22	SVM
PB	6	2017	Corn	GroupA-0706	2.35	0.03	1.98	0.00	2775.62	19.46	338	248	90	SVM
PTB	6	2017	Corn	GroupA-0707	6.12	0.03	5.71	0.00	1728.12	50.64	296	248	48	SVM
PL	6	2017	Corn	GroupA-0708	2.59	0.07	2.18	0.01	632.74	21.47	979	248	731	SVM
PLB	6	2017	Corn	GroupA-0709	3.44	0.00	2.97	0.00	1403.96	28.46	508	248	260	SVM
BG	6	2017	Corn	GroupA-0710	2.99	0.03	2.51	0.02	3938.74	24.70	1426	248	1178	SVM
BBEA	6	2017	Corn	GroupA-0711	2.67	0.01	2.27	0.06	4348.89	22.11	2889	248	2641	SVM
JL	6	2017	Corn	GroupA-0712	2.33	0.01	1.95	0.01	31086.42	19.29	862	248	614	SVM
BS	6	2017	Corn	GroupA-0713	3.49	0.00	2.91	0.01	3688.53	28.85	757	248	509	SVM
AM	6	2018	Corn	GroupA-0714	2.29	0.08	1.88	0.02	1216.49	29.03	1727	244	1483	SVM
CF	6	2018	Corn	GroupA-0715	2.36	0.11	1.82	0.01	1790.97	29.89	1098	244	854	SVM
HB	6	2018	Corn	GroupA-0716	3.81	0.07	3.27	0.00	593.20	48.34	363	244	119	SVM
NH	6	2018	Corn	GroupA-0717	2.60	0.11	2.18	0.00	2271.12	32.93	222	244	-22	SVM
PL	6	2018	Corn	GroupA-0718	2.40	0.05	1.91	0.01	632.74	30.48	974	244	730	SVM
PLB	6	2018	Corn	GroupA-0719	3.54	0.02	3.10	0.00	1403.96	44.92	506	244	262	SVM
BG	6	2018	Corn	GroupA-0720	2.33	0.13	1.79	0.02	3938.74	29.62	1421	244	1177	SVM
BBEA	6	2018	Corn	GroupA-0721	2.60	0.01	2.17	0.07	4348.89	32.98	3047	244	2803	SVM
JL	6	2018	Corn	GroupA-0722	2.99	0.07	2.53	0.01	31086.42	37.89	901	244	657	SVM
AM	6	2019	Corn	GroupA-0723	1.29	0.15	1.08	0.01	1216.49	19.57	992	246	746	SVM
HB	6	2019	Corn	GroupA-0724	1.74	0.09	1.35	0.00	593.20	26.26	365	246	119	SVM
NH	6	2019	Corn	GroupA-0725	1.21	0.02	0.93	0.00	2271.12	18.37	215	246	-31	SVM
BG	6	2019	Corn	GroupA-0726	2.08	0.00	1.78	0.02	3938.74	31.49	1428	246	1182	SVM
BBEA	6	2019	Corn	GroupA-0727	1.51	0.05	1.24	0.07	4348.89	22.78	3067	246	2821	SVM
BS	6	2019	Corn	GroupA-0728	3.75	0.00	3.36	0.01	3688.53	56.71	749	246	503	SVM
NH	AM	2015	Corn	GroupA-0729	1.29	0.00	1.00	0.00	1283.59	18.13	221	276	-55	SVM
PL	AM	2015	Corn	GroupA-0730	1.57	0.02	1.30	0.00	1797.09	22.05	55	276	-221	SVM
6	AM	2016	Corn	GroupA-0731	1.01	0.01	0.76	0.00	1216.49	11.42	249	1759	-1510	SVM
HB	AM	2016	Corn	GroupA-0732	1.13	0.00	0.85	0.00	1351.32	12.84	366	1759	-1393	SVM
NH	AM	2016	Corn	GroupA-0733	1.64	0.00	1.40	0.00	1283.59	18.59	222	1759	-1537	SVM
PL	AM	2016	Corn	GroupA-0734	1.09	0.00	0.84	0.01	1797.09	12.29	978	1759	-781	SVM
PLB	AM	2016	Corn	GroupA-0735	1.24	0.01	0.98	0.00	2601.80	14.05	501	1759	-1258	SVM
BG	AM	2016	Corn	GroupA-0736	1.45	0.01	1.12	0.01	4801.99	16.43	1426	1759	-333	SVM
BBEA	AM	2016	Corn	GroupA-0737	1.22	0.01	0.92	0.06	5233.55	13.77	3066	1759	1307	SVM
6	AM	2017	Corn	GroupA-0738	2.41	0.00	2.01	0.00	1216.49	19.98	248	1746	-1498	SVM
CF	AM	2017	Corn	GroupA-0739	2.50	0.00	2.10	0.01	2925.31	20.74	1099	1746	-647	SVM
HB	AM	2017	Corn	GroupA-0740	3.48	0.00	2.80	0.00	1351.32	28.88	557	1746	-1189	SVM
NH	AM	2017	Corn	GroupA-0741	3.29	0.00	2.85	0.00	1283.59	27.35	226	1746	-1520	SVM
PB	AM	2017	Corn	GroupA-0742	2.19	0.00	1.68	0.00	3991.90	18.20	338	1746	-1408	SVM
PTB	AM	2017	Corn	GroupA-0743	6.37	0.00	5.99	0.00	1901.85	52.90	296	1746	-1450	SVM
PL	AM	2017	Corn	GroupA-0744	3.30	0.03	2.79	0.01	1797.09	27.41	979	1746	-767	SVM
PLB	AM	2017	Corn	GroupA-0745	3.33	0.00	2.87	0.00	2601.80	27.69	508	1746	-1238	SVM
BG	AM	2017	Corn	GroupA-0746	2.83	0.00	2.40	0.01	4801.99	23.52	1426	1746	-320	SVM
BBEA	AM	2017	Corn	GroupA-0747	2.46	0.00	2.04	0.05	5233.55	20.44	2889	1746	1143	SVM
JL	AM	2017	Corn	GroupA-0748	2.57	0.00	2.07	0.01	30699.89	21.37	862	1746	-884	SVM
BS	AM	2017	Corn	GroupA-0749	3.39	0.00	2.85	0.01	4011.02	28.13	757	1746	-989	SVM
6	AM	2018	Corn	GroupA-0750	2.23	0.01	1.84	0.00	1216.49	28.05	244	1727	-1483	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CF	AM	2018	Corn	GroupA-0751	2.36	0.02	1.94	0.01	2925.31	29.67	1098	1727	-629	SVM
HB	AM	2018	Corn	GroupA-0752	2.92	0.03	2.43	0.00	1351.32	36.81	363	1727	-1364	SVM
NH	AM	2018	Corn	GroupA-0753	2.64	0.03	2.28	0.00	1283.59	33.22	222	1727	-1505	SVM
PL	AM	2018	Corn	GroupA-0754	2.52	0.00	2.11	0.01	1797.09	31.71	974	1727	-753	SVM
PLB	AM	2018	Corn	GroupA-0755	3.33	0.00	2.82	0.00	2601.80	41.87	506	1727	-1221	SVM
BG	AM	2018	Corn	GroupA-0756	2.45	0.02	1.89	0.01	4801.99	30.89	1421	1727	-306	SVM
BBEA	AM	2018	Corn	GroupA-0757	2.20	0.02	1.72	0.06	5233.55	27.70	3047	1727	1320	SVM
JL	AM	2018	Corn	GroupA-0758	2.88	0.01	2.42	0.01	30699.89	36.28	901	1727	-826	SVM
6	AM	2019	Corn	GroupA-0759	1.18	0.07	0.92	0.00	1216.49	18.60	246	992	-746	SVM
HB	AM	2019	Corn	GroupA-0760	1.51	0.04	1.21	0.00	1351.32	23.75	365	992	-627	SVM
NH	AM	2019	Corn	GroupA-0761	1.51	0.00	1.20	0.00	1283.59	23.75	215	992	-777	SVM
BG	AM	2019	Corn	GroupA-0762	2.16	0.02	1.86	0.01	4801.99	34.00	1428	992	436	SVM
BBEA	AM	2019	Corn	GroupA-0763	1.67	0.06	1.32	0.06	5233.55	26.28	3067	992	2075	SVM
BS	AM	2019	Corn	GroupA-0764	3.41	0.02	3.06	0.00	4011.02	53.82	749	992	-243	SVM
CF	AM	2020	Corn	GroupA-0765	1.80	0.00	1.45	0.01	2925.31	23.24	1095	742	353	SVM
PB	AM	2020	Corn	GroupA-0766	2.62	0.01	2.30	0.00	3991.90	33.81	333	742	-409	SVM
PE	AM	2020	Corn	GroupA-0767	4.59	0.03	4.35	0.01	4256.93	59.26	942	742	200	SVM
PW	AM	2020	Corn	GroupA-0768	2.97	0.00	2.66	0.00	4299.79	38.45	260	742	-482	SVM
PL	AM	2020	Corn	GroupA-0769	1.59	0.02	1.27	0.01	1797.09	20.61	976	742	234	SVM
PLB	AM	2020	Corn	GroupA-0770	2.00	0.04	1.58	0.00	2601.80	25.83	498	742	-244	SVM
JL	AM	2020	Corn	GroupA-0771	3.30	0.01	2.89	0.01	30699.89	42.61	889	742	147	SVM
PB	CF	2013	Corn	GroupA-0772	1.18	0.00	0.91	0.00	1477.63	13.22	327	1093	-766	SVM
PL	CF	2013	Corn	GroupA-0773	1.57	0.00	1.23	0.01	1531.30	17.67	972	1093	-121	SVM
PLB	CF	2013	Corn	GroupA-0774	1.79	0.03	1.50	0.00	1177.89	20.06	503	1093	-590	SVM
NH	CF	2014	Corn	GroupA-0775	2.99	0.14	2.45	0.00	4061.52	24.80	223	1086	-863	SVM
6	CF	2017	Corn	GroupA-0776	2.06	0.01	1.71	0.00	1790.97	18.83	248	1099	-851	SVM
AM	CF	2017	Corn	GroupA-0777	2.13	0.01	1.67	0.02	2925.31	19.48	1746	1099	647	SVM
HB	CF	2017	Corn	GroupA-0778	3.26	0.09	2.74	0.00	1609.48	29.80	557	1099	-542	SVM
NH	CF	2017	Corn	GroupA-0779	2.19	0.03	1.63	0.00	4061.52	20.00	226	1099	-873	SVM
PB	CF	2017	Corn	GroupA-0780	2.13	0.03	1.76	0.00	1477.63	19.47	338	1099	-761	SVM
PTB	CF	2017	Corn	GroupA-0781	4.89	0.06	4.48	0.00	2125.67	44.66	296	1099	-803	SVM
PL	CF	2017	Corn	GroupA-0782	1.95	0.01	1.48	0.01	1531.30	17.79	979	1099	-120	SVM
PLB	CF	2017	Corn	GroupA-0783	2.13	0.04	1.75	0.00	1177.89	19.46	508	1099	-591	SVM
BG	CF	2017	Corn	GroupA-0784	2.48	0.04	1.83	0.02	3976.07	22.69	1426	1099	327	SVM
BBEA	CF	2017	Corn	GroupA-0785	2.44	0.04	1.92	0.06	4282.54	22.28	2889	1099	1790	SVM
JL	CF	2017	Corn	GroupA-0786	2.46	0.01	2.02	0.01	30895.46	22.49	862	1099	-237	SVM
BS	CF	2017	Corn	GroupA-0787	3.61	0.00	3.08	0.01	3076.95	32.97	757	1099	-342	SVM
6	CF	2018	Corn	GroupA-0788	2.33	0.00	1.82	0.00	1790.97	31.32	244	1098	-854	SVM
AM	CF	2018	Corn	GroupA-0789	2.43	0.00	1.90	0.02	2925.31	32.62	1727	1098	629	SVM
HB	CF	2018	Corn	GroupA-0790	3.22	0.00	2.64	0.00	1609.48	43.33	363	1098	-735	SVM
NH	CF	2018	Corn	GroupA-0791	2.48	0.01	1.95	0.00	4061.52	33.29	222	1098	-876	SVM
PL	CF	2018	Corn	GroupA-0792	2.44	0.00	1.96	0.01	1531.30	32.76	974	1098	-124	SVM
PLB	CF	2018	Corn	GroupA-0793	3.01	0.00	2.44	0.00	1177.89	40.38	506	1098	-592	SVM
BG	CF	2018	Corn	GroupA-0794	2.44	0.00	1.86	0.02	3976.07	32.75	1421	1098	323	SVM
BBEA	CF	2018	Corn	GroupA-0795	2.29	0.01	1.81	0.07	4282.54	30.70	3047	1098	1949	SVM
JL	CF	2018	Corn	GroupA-0796	2.73	0.03	2.22	0.01	30895.46	36.68	901	1098	-197	SVM
AM	CF	2020	Corn	GroupA-0797	1.60	0.02	1.26	0.01	2925.31	19.09	742	1095	-353	SVM
PB	CF	2020	Corn	GroupA-0798	1.96	0.03	1.63	0.00	1477.63	23.28	333	1095	-762	SVM
PE	CF	2020	Corn	GroupA-0799	3.24	0.00	2.90	0.01	1470.34	38.62	942	1095	-153	SVM
PW	CF	2020	Corn	GroupA-0800	2.58	0.00	2.27	0.00	1380.51	30.66	260	1095	-835	SVM
PL	CF	2020	Corn	GroupA-0801	1.80	0.07	1.49	0.01	1531.30	21.37	976	1095	-119	SVM
PLB	CF	2020	Corn	GroupA-0802	1.65	0.02	1.28	0.00	1177.89	19.68	498	1095	-597	SVM
JL	CF	2020	Corn	GroupA-0803	2.92	0.07	2.44	0.01	30895.46	34.80	889	1095	-206	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
6	HB	2016	Corn	GroupA-0804	0.97	0.03	0.77	0.00	593.20	10.61	249	366	-117	SVM
AM	HB	2016	Corn	GroupA-0805	0.88	0.04	0.69	0.02	1351.32	9.58	1759	366	1393	SVM
NH	HB	2016	Corn	GroupA-0806	1.78	0.03	1.62	0.00	2580.18	19.44	222	366	-144	SVM
PL	HB	2016	Corn	GroupA-0807	0.95	0.00	0.74	0.01	1056.49	10.39	978	366	612	SVM
PLB	HB	2016	Corn	GroupA-0808	1.40	0.00	1.12	0.00	1650.52	15.26	501	366	135	SVM
BG	HB	2016	Corn	GroupA-0809	1.38	0.02	1.07	0.02	4415.29	15.06	1426	366	1060	SVM
BBEA	HB	2016	Corn	GroupA-0810	1.49	0.01	1.28	0.07	4811.25	16.23	3066	366	2700	SVM
6	HB	2017	Corn	GroupA-0811	4.17	0.02	3.22	0.00	593.20	44.27	248	557	-309	SVM
AM	HB	2017	Corn	GroupA-0812	4.01	0.02	3.20	0.02	1351.32	42.53	1746	557	1189	SVM
CF	HB	2017	Corn	GroupA-0813	3.68	0.01	2.87	0.01	1609.48	39.06	1099	557	542	SVM
NH	HB	2017	Corn	GroupA-0814	3.34	0.00	2.77	0.00	2580.18	35.46	226	557	-331	SVM
PB	HB	2017	Corn	GroupA-0815	4.44	0.04	3.31	0.00	2853.21	47.05	338	557	-219	SVM
PTB	HB	2017	Corn	GroupA-0816	4.68	0.01	3.99	0.00	1152.69	49.68	296	557	-261	SVM
PL	HB	2017	Corn	GroupA-0817	3.66	0.04	2.92	0.01	1056.49	38.85	979	557	422	SVM
PLB	HB	2017	Corn	GroupA-0818	3.71	0.02	3.07	0.00	1650.52	39.37	508	557	-49	SVM
BG	HB	2017	Corn	GroupA-0819	3.79	0.02	2.99	0.02	4415.29	40.23	1426	557	869	SVM
BBEA	HB	2017	Corn	GroupA-0820	3.44	0.07	2.64	0.06	4811.25	36.48	2889	557	2332	SVM
JL	HB	2017	Corn	GroupA-0821	3.63	0.11	2.76	0.01	30527.42	38.52	862	557	305	SVM
BS	HB	2017	Corn	GroupA-0822	3.53	0.00	2.97	0.01	3100.07	37.47	757	557	200	SVM
6	HB	2018	Corn	GroupA-0823	3.59	0.07	3.19	0.00	593.20	63.14	244	363	-119	SVM
AM	HB	2018	Corn	GroupA-0824	3.17	0.00	2.66	0.02	1351.32	55.66	1727	363	1364	SVM
CF	HB	2018	Corn	GroupA-0825	4.28	0.06	3.69	0.01	1609.48	75.18	1098	363	735	SVM
NH	HB	2018	Corn	GroupA-0826	2.79	0.02	2.38	0.00	2580.18	49.09	222	363	-141	SVM
PL	HB	2018	Corn	GroupA-0827	3.67	0.13	3.18	0.01	1056.49	64.49	974	363	611	SVM
PLB	HB	2018	Corn	GroupA-0828	3.19	0.00	2.63	0.00	1650.52	56.10	506	363	143	SVM
BG	HB	2018	Corn	GroupA-0829	3.56	0.12	3.07	0.02	4415.29	62.68	1421	363	1058	SVM
BBEA	HB	2018	Corn	GroupA-0830	3.46	0.00	2.91	0.07	4811.25	60.76	3047	363	2684	SVM
JL	HB	2018	Corn	GroupA-0831	2.79	0.02	2.23	0.01	30527.42	49.01	901	363	538	SVM
6	HB	2019	Corn	GroupA-0832	2.22	0.01	1.79	0.00	593.20	36.28	246	365	-119	SVM
AM	HB	2019	Corn	GroupA-0833	2.10	0.09	1.68	0.01	1351.32	34.42	992	365	627	SVM
NH	HB	2019	Corn	GroupA-0834	2.25	0.07	1.81	0.00	2580.18	36.79	215	365	-150	SVM
BG	HB	2019	Corn	GroupA-0835	2.88	0.05	2.32	0.02	4415.29	47.15	1428	365	1063	SVM
BBEA	HB	2019	Corn	GroupA-0836	2.71	0.09	2.19	0.07	4811.25	44.38	3067	365	2702	SVM
BS	HB	2019	Corn	GroupA-0837	4.53	0.04	4.05	0.00	3100.07	74.11	749	365	384	SVM
CF	NH	2014	Corn	GroupA-0838	1.34	0.01	1.01	0.01	4061.52	12.88	1086	223	863	SVM
AM	NH	2015	Corn	GroupA-0839	0.93	0.05	0.67	0.00	1283.59	13.23	276	221	55	SVM
PL	NH	2015	Corn	GroupA-0840	1.13	0.01	0.94	0.00	2690.61	16.16	55	221	-166	SVM
6	NH	2016	Corn	GroupA-0841	1.33	0.15	1.11	0.00	2271.12	17.32	249	222	27	SVM
AM	NH	2016	Corn	GroupA-0842	1.31	0.00	1.08	0.03	1283.59	17.10	1759	222	1537	SVM
HB	NH	2016	Corn	GroupA-0843	1.72	0.11	1.55	0.00	2580.18	22.42	366	222	144	SVM
PL	NH	2016	Corn	GroupA-0844	1.01	0.00	0.80	0.01	2690.61	13.12	978	222	756	SVM
PLB	NH	2016	Corn	GroupA-0845	1.33	0.12	1.09	0.00	3474.91	17.28	501	222	279	SVM
BG	NH	2016	Corn	GroupA-0846	2.04	0.01	1.81	0.01	4995.12	26.55	1426	222	1204	SVM
BBEA	NH	2016	Corn	GroupA-0847	1.54	0.04	1.26	0.07	5431.98	20.08	3066	222	2844	SVM
6	NH	2017	Corn	GroupA-0848	2.48	0.00	1.85	0.00	2271.12	23.93	248	226	22	SVM
AM	NH	2017	Corn	GroupA-0849	2.99	0.01	2.42	0.03	1283.59	28.86	1746	226	1520	SVM
CF	NH	2017	Corn	GroupA-0850	2.32	0.11	1.75	0.01	4061.52	22.44	1099	226	873	SVM
HB	NH	2017	Corn	GroupA-0851	3.18	0.00	2.55	0.00	2580.18	30.71	557	226	331	SVM
PB	NH	2017	Corn	GroupA-0852	3.01	0.04	2.34	0.00	4911.94	29.15	338	226	112	SVM
PTB	NH	2017	Corn	GroupA-0853	4.67	0.01	4.34	0.00	3164.44	45.17	296	226	70	SVM
PL	NH	2017	Corn	GroupA-0854	2.45	0.11	2.10	0.01	2690.61	23.67	979	226	753	SVM
PLB	NH	2017	Corn	GroupA-0855	2.27	0.01	1.91	0.00	3474.91	21.95	508	226	282	SVM
BG	NH	2017	Corn	GroupA-0856	2.13	0.00	1.73	0.02	4995.12	20.64	1426	226	1200	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BBEA	NH	2017	Corn	GroupA-0857	2.61	0.00	1.91	0.06	5431.98	25.23	2889	226	2663	SVM
JL	NH	2017	Corn	GroupA-0858	2.66	0.00	1.92	0.01	31398.77	25.76	862	226	636	SVM
BS	NH	2017	Corn	GroupA-0859	2.39	0.06	2.06	0.01	5253.94	23.10	757	226	531	SVM
6	NH	2018	Corn	GroupA-0860	2.59	0.02	2.06	0.00	2271.12	41.34	244	222	22	SVM
AM	NH	2018	Corn	GroupA-0861	3.23	0.10	2.73	0.03	1283.59	51.54	1727	222	1505	SVM
CF	NH	2018	Corn	GroupA-0862	2.32	0.00	1.88	0.01	4061.52	36.91	1098	222	876	SVM
HB	NH	2018	Corn	GroupA-0863	2.23	0.04	1.76	0.00	2580.18	35.59	363	222	141	SVM
PL	NH	2018	Corn	GroupA-0864	2.38	0.00	1.81	0.01	2690.61	37.90	974	222	752	SVM
PLB	NH	2018	Corn	GroupA-0865	2.64	0.03	2.29	0.00	3474.91	42.14	506	222	284	SVM
BG	NH	2018	Corn	GroupA-0866	4.11	0.02	3.39	0.02	4995.12	65.59	1421	222	1199	SVM
BBEA	NH	2018	Corn	GroupA-0867	3.21	0.01	2.48	0.06	5431.98	51.19	3047	222	2825	SVM
JL	NH	2018	Corn	GroupA-0868	2.84	0.00	2.19	0.01	31398.77	45.23	901	222	679	SVM
6	NH	2019	Corn	GroupA-0869	1.80	0.04	1.48	0.00	2271.12	24.02	246	215	31	SVM
AM	NH	2019	Corn	GroupA-0870	2.06	0.17	1.86	0.01	1283.59	27.40	992	215	777	SVM
HB	NH	2019	Corn	GroupA-0871	1.94	0.08	1.67	0.00	2580.18	25.80	365	215	150	SVM
BG	NH	2019	Corn	GroupA-0872	2.12	0.07	1.50	0.02	4995.12	28.25	1428	215	1213	SVM
BBEA	NH	2019	Corn	GroupA-0873	2.22	0.04	1.83	0.07	5431.98	29.60	3067	215	2852	SVM
BS	NH	2019	Corn	GroupA-0874	3.32	0.09	2.79	0.01	5253.94	44.16	749	215	534	SVM
CF	PB	2013	Corn	GroupA-0875	3.85	0.09	3.18	0.01	1477.63	35.04	1093	327	766	SVM
PL	PB	2013	Corn	GroupA-0876	2.43	0.02	1.94	0.01	2233.71	22.09	972	327	645	SVM
PLB	PB	2013	Corn	GroupA-0877	2.59	0.01	2.03	0.00	1437.03	23.56	503	327	176	SVM
6	PB	2017	Corn	GroupA-0878	2.27	0.04	1.92	0.00	2775.62	17.39	248	338	-90	SVM
AM	PB	2017	Corn	GroupA-0879	3.79	0.03	3.33	0.02	3991.90	29.03	1746	338	1408	SVM
CF	PB	2017	Corn	GroupA-0880	2.19	0.00	1.79	0.01	1477.63	16.76	1099	338	761	SVM
HB	PB	2017	Corn	GroupA-0881	5.28	0.01	4.85	0.00	2853.21	40.44	557	338	219	SVM
NH	PB	2017	Corn	GroupA-0882	3.95	0.01	3.59	0.00	4911.94	30.24	226	338	-112	SVM
PTB	PB	2017	Corn	GroupA-0883	8.94	0.00	8.67	0.00	3582.30	68.50	296	338	-42	SVM
PL	PB	2017	Corn	GroupA-0884	3.20	0.01	2.79	0.01	2233.71	24.49	979	338	641	SVM
PLB	PB	2017	Corn	GroupA-0885	2.96	0.00	2.64	0.00	1437.03	22.70	508	338	170	SVM
BG	PB	2017	Corn	GroupA-0886	6.30	0.03	5.83	0.01	3001.92	48.30	1426	338	1088	SVM
BBEA	PB	2017	Corn	GroupA-0887	5.67	0.02	5.19	0.05	3203.03	43.44	2889	338	2551	SVM
JL	PB	2017	Corn	GroupA-0888	2.59	0.00	2.25	0.01	32178.80	19.84	862	338	524	SVM
BS	PB	2017	Corn	GroupA-0889	5.30	0.03	4.89	0.00	4411.96	40.58	757	338	419	SVM
AM	PB	2020	Corn	GroupA-0890	3.96	0.01	3.58	0.00	3991.90	36.16	742	333	409	SVM
CF	PB	2020	Corn	GroupA-0891	2.54	0.02	2.17	0.01	1477.63	23.18	1095	333	762	SVM
PE	PB	2020	Corn	GroupA-0892	2.08	0.00	1.63	0.01	573.60	18.97	942	333	609	SVM
PW	PB	2020	Corn	GroupA-0893	2.05	0.05	1.73	0.00	1133.42	18.74	260	333	-73	SVM
PL	PB	2020	Corn	GroupA-0894	2.11	0.00	1.71	0.01	2233.71	19.24	976	333	643	SVM
PLB	PB	2020	Corn	GroupA-0895	2.22	0.06	1.87	0.00	1437.03	20.29	498	333	165	SVM
JL	PB	2020	Corn	GroupA-0896	1.99	0.00	1.68	0.01	32178.80	18.22	889	333	556	SVM
AM	PE	2020	Corn	GroupA-0897	4.21	0.00	3.89	0.00	4256.93	36.14	742	942	-200	SVM
CF	PE	2020	Corn	GroupA-0898	3.70	0.00	3.29	0.01	1470.34	31.77	1095	942	153	SVM
PB	PE	2020	Corn	GroupA-0899	2.37	0.03	2.04	0.00	573.60	20.38	333	942	-609	SVM
PW	PE	2020	Corn	GroupA-0900	1.98	0.02	1.67	0.00	602.45	16.99	260	942	-682	SVM
PL	PE	2020	Corn	GroupA-0901	2.62	0.03	2.26	0.01	2576.96	22.46	976	942	34	SVM
PLB	PE	2020	Corn	GroupA-0902	2.94	0.01	2.57	0.00	1832.05	25.22	498	942	-444	SVM
JL	PE	2020	Corn	GroupA-0903	1.76	0.03	1.47	0.01	31805.51	15.10	889	942	-53	SVM
AM	PW	2020	Corn	GroupA-0904	2.62	0.03	2.18	0.01	4299.79	25.23	742	260	482	SVM
CF	PW	2020	Corn	GroupA-0905	2.73	0.00	2.41	0.01	1380.51	26.36	1095	260	835	SVM
PB	PW	2020	Corn	GroupA-0906	1.53	0.01	1.23	0.00	1133.42	14.71	333	260	73	SVM
PE	PW	2020	Corn	GroupA-0907	2.00	0.01	1.59	0.01	602.45	19.24	942	260	682	SVM
PL	PW	2020	Corn	GroupA-0908	1.84	0.00	1.46	0.01	2757.07	17.72	976	260	716	SVM
PLB	PW	2020	Corn	GroupA-0909	2.44	0.04	2.15	0.00	2110.84	23.50	498	260	238	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
JL	PW	2020	Corn	GroupA-0910	2.04	0.05	1.73	0.01	31235.93	19.66	889	260	629	SVM
AM	PTB	2017	Corn	GroupA-0912	5.27	0.03	4.77	0.02	1901.85	88.52	1746	296	1450	SVM
CF	PTB	2017	Corn	GroupA-0913	5.60	0.12	4.93	0.01	2125.67	94.16	1099	296	803	SVM
HB	PTB	2017	Corn	GroupA-0914	4.18	0.15	3.63	0.00	1152.69	70.35	557	296	261	SVM
NH	PTB	2017	Corn	GroupA-0915	4.25	0.09	3.73	0.00	3164.44	71.53	226	296	-70	SVM
PL	PTB	2017	Corn	GroupA-0917	5.51	0.00	4.99	0.01	2192.01	92.66	979	296	683	SVM
PLB	PTB	2017	Corn	GroupA-0918	5.14	0.21	4.26	0.00	2652.61	86.40	508	296	212	SVM
BG	PTB	2017	Corn	GroupA-0919	3.88	0.02	3.27	0.02	5528.32	65.27	1426	296	1130	SVM
BBEA	PTB	2017	Corn	GroupA-0920	4.63	0.31	4.12	0.06	5911.78	77.88	2889	296	2593	SVM
JL	PTB	2017	Corn	GroupA-0921	5.59	0.14	4.93	0.01	29375.83	93.93	862	296	566	SVM
BS	PTB	2017	Corn	GroupA-0922	3.17	0.01	2.44	0.01	2114.72	53.36	757	296	461	SVM
CF	PL	2013	Corn	GroupA-0923	2.32	0.00	2.04	0.01	1531.30	22.91	1093	972	121	SVM
PB	PL	2013	Corn	GroupA-0924	1.71	0.00	1.45	0.00	2233.71	16.82	327	972	-645	SVM
PLB	PL	2013	Corn	GroupA-0925	1.37	0.00	1.07	0.00	809.82	13.49	503	972	-469	SVM
AM	PL	2015	Corn	GroupA-0926	1.98	0.06	1.66	0.00	1797.09	24.91	276	55	221	SVM
NH	PL	2015	Corn	GroupA-0927	1.53	0.05	1.27	0.00	2690.61	19.21	221	55	166	SVM
6	PL	2016	Corn	GroupA-0928	1.07	0.00	0.84	0.00	632.74	12.21	249	978	-729	SVM
AM	PL	2016	Corn	GroupA-0929	0.98	0.01	0.75	0.02	1797.09	11.18	1759	978	781	SVM
HB	PL	2016	Corn	GroupA-0930	1.07	0.00	0.80	0.00	1056.49	12.11	366	978	-612	SVM
NH	PL	2016	Corn	GroupA-0931	1.57	0.00	1.36	0.00	2690.61	17.79	222	978	-756	SVM
PLB	PL	2016	Corn	GroupA-0932	1.24	0.00	0.97	0.00	809.82	14.06	501	978	-477	SVM
BG	PL	2016	Corn	GroupA-0933	1.37	0.01	1.04	0.02	3360.23	15.56	1426	978	448	SVM
BBEA	PL	2016	Corn	GroupA-0934	1.45	0.00	1.11	0.07	3759.77	16.53	3066	978	2088	SVM
6	PL	2017	Corn	GroupA-0935	3.01	0.01	2.53	0.00	632.74	28.93	248	979	-731	SVM
AM	PL	2017	Corn	GroupA-0936	2.30	0.01	1.80	0.02	1797.09	22.13	1746	979	767	SVM
CF	PL	2017	Corn	GroupA-0937	1.97	0.01	1.50	0.01	1531.30	18.94	1099	979	120	SVM
HB	PL	2017	Corn	GroupA-0938	3.18	0.02	2.49	0.00	1056.49	30.61	557	979	-422	SVM
NH	PL	2017	Corn	GroupA-0939	1.92	0.00	1.48	0.00	2690.61	18.49	226	979	-753	SVM
PB	PL	2017	Corn	GroupA-0940	2.71	0.00	2.23	0.00	2233.71	26.05	338	979	-641	SVM
PTB	PL	2017	Corn	GroupA-0941	4.98	0.00	4.59	0.00	2192.01	47.89	296	979	-683	SVM
PLB	PL	2017	Corn	GroupA-0942	2.22	0.00	1.77	0.00	809.82	21.30	508	979	-471	SVM
BG	PL	2017	Corn	GroupA-0943	2.26	0.05	1.74	0.02	3360.23	21.73	1426	979	447	SVM
BBEA	PL	2017	Corn	GroupA-0944	2.42	0.00	1.83	0.06	3759.77	23.30	2889	979	1910	SVM
JL	PL	2017	Corn	GroupA-0945	2.95	0.01	2.40	0.01	31562.14	28.34	862	979	-117	SVM
BS	PL	2017	Corn	GroupA-0946	2.51	0.01	2.01	0.01	3972.53	24.16	757	979	-222	SVM
6	PL	2018	Corn	GroupA-0947	2.58	0.02	2.10	0.00	632.74	37.88	244	974	-730	SVM
AM	PL	2018	Corn	GroupA-0948	2.49	0.01	2.04	0.02	1797.09	36.56	1727	974	753	SVM
CF	PL	2018	Corn	GroupA-0949	2.40	0.03	1.93	0.01	1531.30	35.21	1098	974	124	SVM
HB	PL	2018	Corn	GroupA-0950	3.04	0.01	2.51	0.00	1056.49	44.60	363	974	-611	SVM
NH	PL	2018	Corn	GroupA-0951	2.22	0.01	1.87	0.00	2690.61	32.61	222	974	-752	SVM
PLB	PL	2018	Corn	GroupA-0952	2.77	0.00	2.27	0.00	809.82	40.71	506	974	-468	SVM
BG	PL	2018	Corn	GroupA-0953	2.95	0.02	2.38	0.02	3360.23	43.32	1421	974	447	SVM
BBEA	PL	2018	Corn	GroupA-0954	2.37	0.02	1.90	0.07	3759.77	34.85	3047	974	2073	SVM
JL	PL	2018	Corn	GroupA-0955	2.68	0.00	2.16	0.01	31562.14	39.40	901	974	-73	SVM
AM	PL	2020	Corn	GroupA-0956	2.41	0.02	2.05	0.01	1797.09	26.30	742	976	-234	SVM
CF	PL	2020	Corn	GroupA-0957	1.89	0.05	1.43	0.01	1531.30	20.63	1095	976	119	SVM
PB	PL	2020	Corn	GroupA-0958	1.89	0.00	1.51	0.00	2233.71	20.56	333	976	-643	SVM
PE	PL	2020	Corn	GroupA-0959	3.28	0.03	2.93	0.01	2576.96	35.68	942	976	-34	SVM
PW	PL	2020	Corn	GroupA-0960	2.09	0.00	1.69	0.00	2757.07	22.72	260	976	-716	SVM
PLB	PL	2020	Corn	GroupA-0961	1.90	0.02	1.55	0.00	809.82	20.66	498	976	-478	SVM
JL	PL	2020	Corn	GroupA-0962	2.60	0.02	2.13	0.01	31562.14	28.27	889	976	-87	SVM
CF	PLB	2013	Corn	GroupA-0963	2.12	0.00	1.84	0.01	1177.89	21.54	1093	503	590	SVM
PB	PLB	2013	Corn	GroupA-0964	1.68	0.01	1.40	0.00	1437.03	17.06	327	503	-176	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PL	PLB	2013	Corn	GroupA-0965	1.52	0.00	1.19	0.01	809.82	15.45	972	503	469	SVM
6	PLB	2016	Corn	GroupA-0966	1.31	0.00	1.02	0.00	1403.96	15.81	249	501	-252	SVM
AM	PLB	2016	Corn	GroupA-0967	1.12	0.04	0.88	0.03	2601.80	13.50	1759	501	1258	SVM
HB	PLB	2016	Corn	GroupA-0968	1.34	0.00	1.06	0.00	1650.52	16.18	366	501	-135	SVM
NH	PLB	2016	Corn	GroupA-0969	1.37	0.01	1.14	0.00	3474.91	16.48	222	501	-279	SVM
PL	PLB	2016	Corn	GroupA-0970	1.04	0.20	0.76	0.01	809.82	12.47	978	501	477	SVM
BG	PLB	2016	Corn	GroupA-0971	1.48	0.02	1.18	0.02	2941.78	17.84	1426	501	925	SVM
BBEA	PLB	2016	Corn	GroupA-0972	1.42	0.06	1.09	0.07	3296.50	17.12	3066	501	2565	SVM
6	PLB	2017	Corn	GroupA-0973	3.79	0.00	3.30	0.00	1403.96	39.59	248	508	-260	SVM
AM	PLB	2017	Corn	GroupA-0974	2.41	0.03	2.01	0.03	2601.80	25.14	1746	508	1238	SVM
CF	PLB	2017	Corn	GroupA-0975	2.35	0.04	1.87	0.01	1177.89	24.58	1099	508	591	SVM
HB	PLB	2017	Corn	GroupA-0976	3.49	0.03	2.92	0.00	1650.52	36.50	557	508	49	SVM
NH	PLB	2017	Corn	GroupA-0977	2.10	0.00	1.68	0.00	3474.91	21.96	226	508	-282	SVM
PB	PLB	2017	Corn	GroupA-0978	3.62	0.00	3.08	0.00	1437.03	37.76	338	508	-170	SVM
PTB	PLB	2017	Corn	GroupA-0979	4.32	0.01	3.77	0.00	2652.61	45.09	296	508	-212	SVM
PL	PLB	2017	Corn	GroupA-0980	2.17	0.04	1.66	0.01	809.82	22.70	979	508	471	SVM
BG	PLB	2017	Corn	GroupA-0981	2.34	0.00	1.84	0.02	2941.78	24.48	1426	508	918	SVM
BBEA	PLB	2017	Corn	GroupA-0982	2.79	0.00	2.23	0.07	3296.50	29.09	2889	508	2381	SVM
JL	PLB	2017	Corn	GroupA-0983	4.65	0.06	4.01	0.01	31878.96	48.58	862	508	354	SVM
BS	PLB	2017	Corn	GroupA-0984	2.50	0.00	2.01	0.01	4109.93	26.15	757	508	249	SVM
6	PLB	2018	Corn	GroupA-0985	3.27	0.00	2.65	0.00	1403.96	58.27	244	506	-262	SVM
AM	PLB	2018	Corn	GroupA-0986	3.13	0.04	2.59	0.03	2601.80	55.91	1727	506	1221	SVM
CF	PLB	2018	Corn	GroupA-0987	2.94	0.01	2.41	0.01	1177.89	52.50	1098	506	592	SVM
HB	PLB	2018	Corn	GroupA-0988	2.89	0.00	2.41	0.00	1650.52	51.55	363	506	-143	SVM
NH	PLB	2018	Corn	GroupA-0989	2.46	0.04	2.05	0.00	3474.91	43.89	222	506	-284	SVM
PL	PLB	2018	Corn	GroupA-0990	2.57	0.04	2.07	0.01	809.82	45.76	974	506	468	SVM
BG	PLB	2018	Corn	GroupA-0991	3.70	0.02	3.09	0.02	2941.78	66.04	1421	506	915	SVM
BBEA	PLB	2018	Corn	GroupA-0992	2.88	0.05	2.28	0.07	3296.50	51.37	3047	506	2541	SVM
JL	PLB	2018	Corn	GroupA-0993	4.32	0.05	3.49	0.01	31878.96	77.10	901	506	395	SVM
AM	PLB	2020	Corn	GroupA-0994	2.48	0.07	2.09	0.01	2601.80	26.77	742	498	244	SVM
CF	PLB	2020	Corn	GroupA-0995	2.13	0.02	1.53	0.01	1177.89	22.95	1095	498	597	SVM
PB	PLB	2020	Corn	GroupA-0996	1.85	0.02	1.44	0.00	1437.03	19.97	333	498	-165	SVM
PE	PLB	2020	Corn	GroupA-0997	3.52	0.00	3.15	0.01	1832.05	37.96	942	498	444	SVM
PW	PLB	2020	Corn	GroupA-0998	2.11	0.01	1.72	0.00	2110.84	22.74	260	498	-238	SVM
PL	PLB	2020	Corn	GroupA-0999	2.01	0.00	1.64	0.01	809.82	21.71	976	498	478	SVM
JL	PLB	2020	Corn	GroupA-1000	3.12	0.02	2.62	0.01	31878.96	33.57	889	498	391	SVM
6	BG	2016	Corn	GroupA-1001	1.69	0.00	1.24	0.00	3938.74	19.58	249	1426	-1177	SVM
AM	BG	2016	Corn	GroupA-1002	1.79	0.02	1.39	0.02	4801.99	20.71	1759	1426	333	SVM
HB	BG	2016	Corn	GroupA-1003	1.66	0.01	1.21	0.00	4415.29	19.28	366	1426	-1060	SVM
NH	BG	2016	Corn	GroupA-1004	2.11	0.00	1.87	0.00	4995.12	24.43	222	1426	-1204	SVM
PL	BG	2016	Corn	GroupA-1005	1.73	0.00	1.26	0.01	3360.23	20.11	978	1426	-448	SVM
PLB	BG	2016	Corn	GroupA-1006	1.69	0.02	1.27	0.00	2941.78	19.64	501	1426	-925	SVM
BBEA	BG	2016	Corn	GroupA-1007	1.89	0.04	1.48	0.08	438.12	21.89	3066	1426	1640	SVM
6	BG	2017	Corn	GroupA-1008	3.73	0.01	3.08	0.00	3938.74	39.78	248	1426	-1178	SVM
AM	BG	2017	Corn	GroupA-1009	3.51	0.00	2.85	0.02	4801.99	37.41	1746	1426	320	SVM
CF	BG	2017	Corn	GroupA-1010	3.63	0.10	2.80	0.01	3976.07	38.72	1099	1426	-327	SVM
HB	BG	2017	Corn	GroupA-1011	2.73	0.09	2.15	0.00	4415.29	29.09	557	1426	-869	SVM
NH	BG	2017	Corn	GroupA-1012	2.61	0.00	2.01	0.00	4995.12	27.87	226	1426	-1200	SVM
PB	BG	2017	Corn	GroupA-1013	4.19	0.04	3.42	0.00	3001.92	44.74	338	1426	-1088	SVM
PTB	BG	2017	Corn	GroupA-1014	4.09	0.05	3.51	0.00	5528.32	43.60	296	1426	-1130	SVM
PL	BG	2017	Corn	GroupA-1015	3.62	0.05	2.88	0.01	3360.23	38.65	979	1426	-447	SVM
PLB	BG	2017	Corn	GroupA-1016	2.98	0.00	2.32	0.00	2941.78	31.78	508	1426	-918	SVM
BBEA	BG	2017	Corn	GroupA-1017	2.45	0.24	1.94	0.06	438.12	26.12	2889	1426	1463	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
JL	BG	2017	Corn	GroupA-1018	3.97	0.00	3.25	0.01	34820.43	42.31	862	1426	-564	SVM
BS	BG	2017	Corn	GroupA-1019	2.72	0.02	2.14	0.01	7029.70	29.00	757	1426	-669	SVM
6	BG	2018	Corn	GroupA-1020	2.83	0.02	2.31	0.00	3938.74	36.62	244	1421	-1177	SVM
AM	BG	2018	Corn	GroupA-1021	3.00	0.01	2.37	0.02	4801.99	38.85	1727	1421	306	SVM
CF	BG	2018	Corn	GroupA-1022	2.97	0.02	2.39	0.01	3976.07	38.44	1098	1421	-323	SVM
HB	BG	2018	Corn	GroupA-1023	3.41	0.06	2.91	0.00	4415.29	44.14	363	1421	-1058	SVM
NH	BG	2018	Corn	GroupA-1024	3.27	0.00	2.79	0.00	4995.12	42.33	222	1421	-1199	SVM
PL	BG	2018	Corn	GroupA-1025	3.05	0.01	2.51	0.01	3360.23	39.51	974	1421	-447	SVM
PLB	BG	2018	Corn	GroupA-1026	3.69	0.01	3.09	0.00	2941.78	47.75	506	1421	-915	SVM
BBEA	BG	2018	Corn	GroupA-1027	2.50	0.21	1.94	0.07	438.12	32.38	3047	1421	1626	SVM
JL	BG	2018	Corn	GroupA-1028	3.26	0.00	2.55	0.01	34820.43	42.19	901	1421	-520	SVM
6	BG	2019	Corn	GroupA-1029	2.42	0.01	2.01	0.00	3938.74	32.26	246	1428	-1182	SVM
AM	BG	2019	Corn	GroupA-1030	2.81	0.00	2.43	0.01	4801.99	37.50	992	1428	-436	SVM
HB	BG	2019	Corn	GroupA-1031	3.13	0.00	2.60	0.00	4415.29	41.81	365	1428	-1063	SVM
NH	BG	2019	Corn	GroupA-1032	2.63	0.00	2.18	0.00	4995.12	35.14	215	1428	-1213	SVM
BBEA	BG	2019	Corn	GroupA-1033	2.41	0.03	1.85	0.08	438.12	32.24	3067	1428	1639	SVM
BS	BG	2019	Corn	GroupA-1034	2.58	0.00	2.01	0.00	7029.70	34.47	749	1428	-679	SVM
BBEA	BG	2021	Corn	GroupA-1035	2.30	0.14	1.83	0.07	438.12	22.19	3029	1430	1599	SVM
BS	BG	2021	Corn	GroupA-1036	4.82	0.06	4.17	0.00	7029.70	46.36	645	1430	-785	SVM
6	BBEA	2016	Corn	GroupA-1037	1.97	0.00	1.41	0.00	4348.89	24.38	249	3066	-2817	SVM
AM	BBEA	2016	Corn	GroupA-1038	1.90	0.04	1.41	0.02	5233.55	23.54	1759	3066	-1307	SVM
HB	BBEA	2016	Corn	GroupA-1039	2.02	0.00	1.47	0.00	4811.25	24.96	366	3066	-2700	SVM
NH	BBEA	2016	Corn	GroupA-1040	1.96	0.01	1.61	0.00	5431.98	24.31	222	3066	-2844	SVM
PL	BBEA	2016	Corn	GroupA-1041	2.02	0.01	1.48	0.01	3759.77	24.98	978	3066	-2088	SVM
PLB	BBEA	2016	Corn	GroupA-1042	2.03	0.00	1.46	0.00	3296.50	25.16	501	3066	-2565	SVM
BG	BBEA	2016	Corn	GroupA-1043	1.88	0.08	1.41	0.01	438.12	23.32	1426	3066	-1640	SVM
6	BBEA	2017	Corn	GroupA-1044	3.00	0.01	2.28	0.00	4348.89	28.16	248	2889	-2641	SVM
AM	BBEA	2017	Corn	GroupA-1045	3.21	0.01	2.54	0.02	5233.55	30.11	1746	2889	-1143	SVM
CF	BBEA	2017	Corn	GroupA-1046	3.17	0.05	2.48	0.01	4282.54	29.76	1099	2889	-1790	SVM
HB	BBEA	2017	Corn	GroupA-1047	2.93	0.05	2.30	0.00	4811.25	27.46	557	2889	-2332	SVM
NH	BBEA	2017	Corn	GroupA-1048	2.88	0.00	2.40	0.00	5431.98	27.03	226	2889	-2663	SVM
PB	BBEA	2017	Corn	GroupA-1049	3.31	0.02	2.45	0.00	3203.03	31.04	338	2889	-2551	SVM
PTB	BBEA	2017	Corn	GroupA-1050	5.20	0.04	4.68	0.00	5911.78	48.79	296	2889	-2593	SVM
PL	BBEA	2017	Corn	GroupA-1051	3.00	0.03	2.38	0.01	3759.77	28.12	979	2889	-1910	SVM
PLB	BBEA	2017	Corn	GroupA-1052	2.90	0.00	2.34	0.00	3296.50	27.24	508	2889	-2381	SVM
BG	BBEA	2017	Corn	GroupA-1053	2.61	0.17	2.06	0.01	438.12	24.43	1426	2889	-1463	SVM
JL	BBEA	2017	Corn	GroupA-1054	3.10	0.00	2.40	0.01	35161.19	29.06	862	2889	-2027	SVM
BS	BBEA	2017	Corn	GroupA-1055	2.95	0.05	2.42	0.01	7352.54	27.64	757	2889	-2132	SVM
6	BBEA	2018	Corn	GroupA-1056	3.09	0.00	2.57	0.00	4348.89	39.74	244	3047	-2803	SVM
AM	BBEA	2018	Corn	GroupA-1057	3.29	0.00	2.61	0.02	5233.55	42.39	1727	3047	-1320	SVM
CF	BBEA	2018	Corn	GroupA-1058	2.99	0.00	2.43	0.01	4282.54	38.50	1098	3047	-1949	SVM
HB	BBEA	2018	Corn	GroupA-1059	3.23	0.07	2.65	0.00	4811.25	41.54	363	3047	-2684	SVM
NH	BBEA	2018	Corn	GroupA-1060	3.38	0.00	2.88	0.00	5431.98	43.58	222	3047	-2825	SVM
PL	BBEA	2018	Corn	GroupA-1061	3.08	0.01	2.49	0.01	3759.77	39.69	974	3047	-2073	SVM
PLB	BBEA	2018	Corn	GroupA-1062	3.36	0.02	2.70	0.00	3296.50	43.24	506	3047	-2541	SVM
BG	BBEA	2018	Corn	GroupA-1063	2.94	0.11	2.26	0.01	438.12	37.88	1421	3047	-1626	SVM
JL	BBEA	2018	Corn	GroupA-1064	3.68	0.02	2.93	0.01	35161.19	47.43	901	3047	-2146	SVM
6	BBEA	2019	Corn	GroupA-1065	2.13	0.00	1.74	0.00	4348.89	29.60	246	3067	-2821	SVM
AM	BBEA	2019	Corn	GroupA-1066	2.40	0.03	2.01	0.01	5233.55	33.33	992	3067	-2075	SVM
HB	BBEA	2019	Corn	GroupA-1067	2.76	0.00	2.24	0.00	4811.25	38.35	365	3067	-2702	SVM
NH	BBEA	2019	Corn	GroupA-1068	2.21	0.01	1.78	0.00	5431.98	30.71	215	3067	-2852	SVM
BG	BBEA	2019	Corn	GroupA-1069	2.21	0.05	1.68	0.01	438.12	30.74	1428	3067	-1639	SVM
BS	BBEA	2019	Corn	GroupA-1070	2.65	0.00	2.10	0.01	7352.54	36.79	749	3067	-2318	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BG	BBEA	2021	Corn	GroupA-1071	2.80	0.11	2.11	0.01	438.12	29.40	1430	3029	-1599	SVM
BS	BBEA	2021	Corn	GroupA-1072	3.81	0.02	3.08	0.00	7352.54	40.02	645	3029	-2384	SVM
CS	AA	2015	Corn	GroupA-1073	3.15	0.06	2.55	0.04	1521.14	26.89	2451	3961	-1510	SVM
RD	AA	2015	Corn	GroupA-1074	3.65	0.00	3.20	0.01	28035.93	31.15	1261	3961	-2700	SVM
CS	AA	2016	Corn	GroupA-1075	2.14	0.23	1.66	0.04	1521.14	21.90	2440	3973	-1533	SVM
SP	AA	2016	Corn	GroupA-1076	2.87	0.06	2.39	0.03	3305.23	29.40	1988	3973	-1985	SVM
CS	AA	2017	Corn	GroupA-1077	2.73	0.09	2.20	0.04	1521.14	22.00	2373	3860	-1487	SVM
SP	AA	2017	Corn	GroupA-1078	3.03	0.04	2.40	0.02	3305.23	24.42	1799	3860	-2061	SVM
RD	AA	2017	Corn	GroupA-1079	3.25	0.00	2.74	0.01	28035.93	26.12	1261	3860	-2599	SVM
CS	AA	2018	Corn	GroupA-1080	3.50	0.09	2.83	0.04	1521.14	31.20	2437	3975	-1538	SVM
SP	AA	2018	Corn	GroupA-1081	3.14	0.11	2.53	0.03	3305.23	28.01	1988	3975	-1987	SVM
1P	AA	2018	Corn	GroupA-1082	4.22	0.00	3.64	0.00	14966.67	37.64	770	3975	-3205	SVM
2PB	AA	2018	Corn	GroupA-1083	6.56	0.01	5.81	0.02	14577.73	58.51	1764	3975	-2211	SVM
1P	AA	2020	Corn	GroupA-1084	2.23	0.04	1.87	0.00	14966.67	17.71	770	3962	-3192	SVM
2PB	AA	2020	Corn	GroupA-1085	2.57	0.04	2.16	0.02	14577.73	20.38	1769	3962	-2193	SVM
AA	CS	2015	Corn	GroupA-1086	3.51	0.06	2.77	0.11	1521.14	40.17	3961	2451	1510	SVM
RD	CS	2015	Corn	GroupA-1087	2.45	0.01	2.09	0.01	28340.32	28.02	1261	2451	-1190	SVM
AA	CS	2016	Corn	GroupA-1088	2.35	0.23	1.89	0.11	1521.14	26.12	3973	2440	1533	SVM
SP	CS	2016	Corn	GroupA-1089	2.85	0.13	2.24	0.03	2392.70	31.66	1988	2440	-452	SVM
AA	CS	2017	Corn	GroupA-1090	2.47	0.05	1.94	0.11	1521.14	20.34	3860	2373	1487	SVM
SP	CS	2017	Corn	GroupA-1091	2.42	0.05	1.92	0.02	2392.70	19.97	1799	2373	-574	SVM
RD	CS	2017	Corn	GroupA-1092	2.38	0.02	1.91	0.01	28340.32	19.59	1261	2373	-1112	SVM
AA	CS	2018	Corn	GroupA-1093	3.23	0.08	2.64	0.11	1521.14	28.15	3975	2437	1538	SVM
SP	CS	2018	Corn	GroupA-1094	3.11	0.11	2.56	0.03	2392.70	27.15	1988	2437	-449	SVM
1P	CS	2018	Corn	GroupA-1095	4.35	0.03	3.77	0.00	13564.88	37.98	770	2437	-1667	SVM
2PB	CS	2018	Corn	GroupA-1096	6.36	0.02	5.72	0.02	13145.07	55.50	1764	2437	-673	SVM
SP	CS	2019	Corn	GroupA-1097	2.75	0.12	2.25	0.03	2392.70	25.26	1989	2440	-451	SVM
RD	CS	2019	Corn	GroupA-1098	3.72	0.01	3.16	0.01	28340.32	34.15	1257	2440	-1183	SVM
SP	CS	2021	Corn	GroupA-1099	1.89	0.17	1.52	0.03	2392.70	13.29	1978	2437	-459	SVM
MP	CS	2021	Corn	GroupA-1100	3.92	0.00	3.56	0.01	10327.57	27.60	924	2437	-1513	SVM
6	JL	2017	Corn	GroupA-1101	2.86	0.02	2.36	0.00	31086.42	22.51	248	862	-614	SVM
AM	JL	2017	Corn	GroupA-1102	3.07	0.01	2.48	0.02	30699.89	24.16	1746	862	884	SVM
CF	JL	2017	Corn	GroupA-1103	3.46	0.00	3.01	0.01	30895.46	27.26	1099	862	237	SVM
HB	JL	2017	Corn	GroupA-1104	3.87	0.04	3.33	0.00	30527.42	30.46	557	862	-305	SVM
NH	JL	2017	Corn	GroupA-1105	3.71	0.00	3.30	0.00	31398.77	29.26	226	862	-636	SVM
PB	JL	2017	Corn	GroupA-1106	2.57	0.03	2.05	0.00	32178.80	20.22	338	862	-524	SVM
PTB	JL	2017	Corn	GroupA-1107	7.05	0.05	6.53	0.00	29375.83	55.52	296	862	-566	SVM
PL	JL	2017	Corn	GroupA-1108	3.60	0.01	3.06	0.01	31562.14	28.36	979	862	117	SVM
PLB	JL	2017	Corn	GroupA-1109	4.42	0.03	3.94	0.00	31878.96	34.85	508	862	-354	SVM
BG	JL	2017	Corn	GroupA-1110	4.11	0.02	3.67	0.01	34820.43	32.35	1426	862	564	SVM
BBEA	JL	2017	Corn	GroupA-1111	3.23	0.00	2.73	0.05	35161.19	25.45	2889	862	2027	SVM
BS	JL	2017	Corn	GroupA-1112	4.78	0.02	4.26	0.01	27818.58	37.71	757	862	-105	SVM
6	JL	2018	Corn	GroupA-1113	3.26	0.01	2.79	0.00	31086.42	39.03	244	901	-657	SVM
AM	JL	2018	Corn	GroupA-1114	2.97	0.06	2.38	0.02	30699.89	35.49	1727	901	826	SVM
CF	JL	2018	Corn	GroupA-1115	3.81	0.10	3.24	0.01	30895.46	45.53	1098	901	197	SVM
HB	JL	2018	Corn	GroupA-1116	3.68	0.08	3.15	0.00	30527.42	44.05	363	901	-538	SVM
NH	JL	2018	Corn	GroupA-1117	3.88	0.01	3.29	0.00	31398.77	46.40	222	901	-679	SVM
PL	JL	2018	Corn	GroupA-1118	3.47	0.00	2.88	0.01	31562.14	41.49	974	901	73	SVM
PLB	JL	2018	Corn	GroupA-1119	4.88	0.01	4.21	0.00	31878.96	58.32	506	901	-395	SVM
BG	JL	2018	Corn	GroupA-1120	3.27	0.00	2.73	0.01	34820.43	39.16	1421	901	520	SVM
BBEA	JL	2018	Corn	GroupA-1121	3.38	0.01	2.79	0.06	35161.19	40.40	3047	901	2146	SVM
AM	JL	2020	Corn	GroupA-1122	3.84	0.01	3.41	0.00	30699.89	35.03	742	889	-147	SVM
CF	JL	2020	Corn	GroupA-1123	3.17	0.00	2.77	0.01	30895.46	28.87	1095	889	206	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PB	JL	2020	Corn	GroupA-1124	2.30	0.01	1.98	0.00	32178.80	20.95	333	889	-556	SVM
PE	JL	2020	Corn	GroupA-1125	2.42	0.10	1.78	0.01	31805.51	22.07	942	889	53	SVM
PW	JL	2020	Corn	GroupA-1126	2.17	0.01	1.83	0.00	31235.93	19.79	260	889	-629	SVM
PL	JL	2020	Corn	GroupA-1127	3.15	0.02	2.73	0.01	31562.14	28.75	976	889	87	SVM
PLB	JL	2020	Corn	GroupA-1128	3.56	0.00	3.10	0.00	31878.96	32.46	498	889	-391	SVM
AA	SP	2016	Corn	GroupA-1129	2.53	0.23	2.11	0.12	3305.23	29.00	3973	1988	1985	SVM
CS	SP	2016	Corn	GroupA-1130	2.31	0.38	1.66	0.04	2392.70	26.45	2440	1988	452	SVM
AA	SP	2017	Corn	GroupA-1131	2.92	0.08	2.31	0.10	3305.23	23.17	3860	1799	2061	SVM
CS	SP	2017	Corn	GroupA-1132	2.76	0.04	2.23	0.04	2392.70	21.95	2373	1799	574	SVM
RD	SP	2017	Corn	GroupA-1133	3.12	0.01	2.70	0.01	30697.43	24.78	1261	1799	-538	SVM
AA	SP	2018	Corn	GroupA-1134	3.14	0.06	2.43	0.11	3305.23	30.58	3975	1988	1987	SVM
CS	SP	2018	Corn	GroupA-1135	2.65	0.24	2.08	0.04	2392.70	25.83	2437	1988	449	SVM
1P	SP	2018	Corn	GroupA-1136	3.72	0.01	3.10	0.01	13803.38	36.21	770	1988	-1218	SVM
2PB	SP	2018	Corn	GroupA-1137	6.09	0.02	5.41	0.02	13252.46	59.26	1764	1988	-224	SVM
CS	SP	2019	Corn	GroupA-1138	2.60	0.18	2.06	0.04	2392.70	24.79	2440	1989	451	SVM
RD	SP	2019	Corn	GroupA-1139	3.40	0.06	2.90	0.01	30697.43	32.39	1257	1989	-732	SVM
CS	SP	2021	Corn	GroupA-1140	2.00	0.16	1.50	0.04	2392.70	15.08	2437	1978	459	SVM
MP	SP	2021	Corn	GroupA-1141	3.09	0.00	2.72	0.01	10398.84	23.29	924	1978	-1054	SVM
AA	1P	2018	Corn	GroupA-1142	3.91	0.07	3.09	0.10	14966.67	37.87	3975	770	3205	SVM
CS	1P	2018	Corn	GroupA-1143	4.16	0.02	3.55	0.04	13564.88	40.32	2437	770	1667	SVM
SP	1P	2018	Corn	GroupA-1144	2.69	0.01	2.15	0.03	13803.38	26.06	1988	770	1218	SVM
2PB	1P	2018	Corn	GroupA-1145	2.80	0.04	2.20	0.03	884.63	27.08	1764	770	994	SVM
AA	1P	2020	Corn	GroupA-1146	2.38	0.04	1.93	0.11	14966.67	18.82	3962	770	3192	SVM
2PB	1P	2020	Corn	GroupA-1147	1.61	0.06	1.27	0.03	884.63	12.74	1769	770	999	SVM
AA	2PB	2018	Corn	GroupA-1148	3.97	0.01	3.18	0.09	14577.73	37.34	3975	1764	2211	SVM
CS	2PB	2018	Corn	GroupA-1149	4.17	0.01	3.50	0.03	13145.07	39.20	2437	1764	673	SVM
SP	2PB	2018	Corn	GroupA-1150	2.88	0.00	2.36	0.03	13252.46	27.05	1988	1764	224	SVM
1P	2PB	2018	Corn	GroupA-1151	3.04	0.05	2.52	0.01	884.63	28.55	770	1764	-994	SVM
AA	2PB	2020	Corn	GroupA-1152	2.71	0.01	2.15	0.10	14577.73	22.60	3962	1769	2193	SVM
1P	2PB	2020	Corn	GroupA-1153	1.94	0.10	1.49	0.01	884.63	16.19	770	1769	-999	SVM
CS	MP	2021	Corn	GroupA-1154	2.89	0.03	2.34	0.05	10327.57	26.85	2437	924	1513	SVM
SP	MP	2021	Corn	GroupA-1155	2.46	0.01	1.91	0.03	10398.84	22.80	1978	924	1054	SVM
6	BS	2017	Corn	GroupA-1156	4.08	0.00	3.31	0.00	3688.53	44.38	248	757	-509	SVM
AM	BS	2017	Corn	GroupA-1157	3.18	0.00	2.48	0.02	4011.02	34.59	1746	757	989	SVM
CF	BS	2017	Corn	GroupA-1158	3.31	0.00	2.52	0.01	3076.95	36.01	1099	757	342	SVM
HB	BS	2017	Corn	GroupA-1159	3.35	0.00	2.61	0.00	3100.07	36.42	557	757	-200	SVM
NH	BS	2017	Corn	GroupA-1160	2.71	0.00	2.21	0.00	5253.94	29.52	226	757	-531	SVM
PB	BS	2017	Corn	GroupA-1161	4.08	0.01	3.28	0.00	4411.96	44.37	338	757	-419	SVM
PTB	BS	2017	Corn	GroupA-1162	3.88	0.00	3.31	0.00	2114.72	42.25	296	757	-461	SVM
PL	BS	2017	Corn	GroupA-1163	2.98	0.02	2.28	0.01	3972.53	32.40	979	757	222	SVM
PLB	BS	2017	Corn	GroupA-1164	2.64	0.04	2.07	0.00	4109.93	28.72	508	757	-249	SVM
BG	BS	2017	Corn	GroupA-1165	2.80	0.00	2.22	0.02	7029.70	30.53	1426	757	669	SVM
BBEA	BS	2017	Corn	GroupA-1166	3.37	0.00	2.58	0.07	7352.54	36.68	2889	757	2132	SVM
JL	BS	2017	Corn	GroupA-1167	3.67	0.00	2.86	0.01	27818.58	39.96	862	757	105	SVM
6	BS	2019	Corn	GroupA-1168	3.82	0.01	3.39	0.00	3688.53	39.98	246	749	-503	SVM
AM	BS	2019	Corn	GroupA-1169	4.36	0.00	3.88	0.01	4011.02	45.72	992	749	243	SVM
HB	BS	2019	Corn	GroupA-1170	4.35	0.05	3.82	0.00	3100.07	45.61	365	749	-384	SVM
NH	BS	2019	Corn	GroupA-1171	3.74	0.00	3.29	0.00	5253.94	39.21	215	749	-534	SVM
BG	BS	2019	Corn	GroupA-1172	3.34	0.00	3.01	0.02	7029.70	34.96	1428	749	679	SVM
BBEA	BS	2019	Corn	GroupA-1173	3.73	0.00	3.28	0.07	7352.54	39.11	3067	749	2318	SVM
BG	BS	2021	Corn	GroupA-1174	4.05	0.02	3.29	0.02	7029.70	49.47	1430	645	785	SVM
BBEA	BS	2021	Corn	GroupA-1175	2.79	0.02	2.18	0.07	7352.54	34.08	3029	645	2384	SVM
AA	RD	2015	Corn	GroupA-1176	3.44	0.00	2.94	0.11	28035.93	39.49	3961	1261	2700	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CS	RD	2015	Corn	GroupA-1177	2.30	0.00	1.87	0.04	28340.32	26.38	2451	1261	1190	SVM
AA	RD	2017	Corn	GroupA-1178	2.53	0.08	1.92	0.09	28035.93	21.08	3860	1261	2599	SVM
CS	RD	2017	Corn	GroupA-1179	2.05	0.13	1.63	0.04	28340.32	17.10	2373	1261	1112	SVM
SP	RD	2017	Corn	GroupA-1180	2.44	0.01	1.92	0.02	30697.43	20.34	1799	1261	538	SVM
CS	RD	2019	Corn	GroupA-1181	3.22	0.00	2.82	0.04	28340.32	32.27	2440	1257	1183	SVM
SP	RD	2019	Corn	GroupA-1182	2.30	0.00	1.85	0.03	30697.43	23.06	1989	1257	732	SVM
AM	6	2013	Soybeans	GroupA-0001	0.71	0.05	0.59	0.00	1216.49	18.54	1748	249	1499	ENR
HB	6	2013	Soybeans	GroupA-0002	1.25	0.03	1.14	0.00	593.20	32.75	558	249	309	ENR
NH	6	2013	Soybeans	GroupA-0003	2.99	0.03	2.37	0.00	2271.12	78.60	173	249	-76	ENR
PTB	6	2013	Soybeans	GroupA-0004	2.14	0.01	1.62	0.00	1728.12	56.20	289	249	40	ENR
BG	6	2013	Soybeans	GroupA-0005	1.27	0.04	1.13	0.00	3938.74	33.28	1438	249	1189	ENR
BBEA	6	2013	Soybeans	GroupA-0006	1.48	0.06	1.40	0.00	4348.89	38.95	3081	249	2832	ENR
SP	6	2013	Soybeans	GroupA-0008	2.87	0.00	2.83	0.00	32717.90	75.34	1994	249	1745	ENR
BS	6	2013	Soybeans	GroupA-0009	0.84	0.04	0.69	0.00	3688.53	21.97	656	249	407	ENR
AM	6	2014	Soybeans	GroupA-0010	0.73	0.00	0.63	0.00	1216.49	16.76	1748	250	1498	ENR
HB	6	2014	Soybeans	GroupA-0011	2.11	0.18	1.92	0.00	593.20	48.39	555	250	305	ENR
PB	6	2014	Soybeans	GroupA-0012	1.01	0.00	0.93	0.00	2775.62	23.17	334	250	84	ENR
PTB	6	2014	Soybeans	GroupA-0013	1.45	0.14	1.36	0.00	1728.12	33.13	299	250	49	ENR
PL	6	2014	Soybeans	GroupA-0014	0.71	0.01	0.63	0.00	632.74	16.33	974	250	724	ENR
PLB	6	2014	Soybeans	GroupA-0015	1.24	0.01	0.98	0.00	1403.96	28.49	500	250	250	ENR
BG	6	2014	Soybeans	GroupA-0016	2.74	0.02	2.67	0.00	3938.74	62.64	1438	250	1188	ENR
BBEA	6	2014	Soybeans	GroupA-0017	2.72	0.06	2.66	0.00	4348.89	62.20	3084	250	2834	ENR
BS	6	2014	Soybeans	GroupA-0019	2.11	0.00	1.95	0.00	3688.53	48.21	656	250	406	ENR
AM	6	2015	Soybeans	GroupA-0020	0.68	0.02	0.59	0.00	1216.49	25.90	1467	251	1216	ENR
CF	6	2015	Soybeans	GroupA-0021	0.83	0.02	0.66	0.00	1790.97	31.30	1097	251	846	ENR
HB	6	2015	Soybeans	GroupA-0022	2.05	0.16	1.95	0.00	593.20	77.73	549	251	298	ENR
PB	6	2015	Soybeans	GroupA-0023	1.05	0.06	0.93	0.00	2775.62	39.78	327	251	76	ENR
PTB	6	2015	Soybeans	GroupA-0024	0.55	0.02	0.43	0.00	1728.12	20.96	303	251	52	ENR
PL	6	2015	Soybeans	GroupA-0025	0.70	0.03	0.60	0.00	632.74	26.36	905	251	654	ENR
PLB	6	2015	Soybeans	GroupA-0026	2.09	0.03	1.88	0.00	1403.96	79.09	499	251	248	ENR
BG	6	2015	Soybeans	GroupA-0027	1.81	0.00	1.74	0.00	3938.74	68.62	1384	251	1133	ENR
BBEA	6	2015	Soybeans	GroupA-0028	1.84	0.00	1.77	0.00	4348.89	69.82	2811	251	2560	ENR
BS	6	2015	Soybeans	GroupA-0029	0.82	0.01	0.72	0.00	3688.53	31.20	659	251	408	ENR
AM	6	2020	Soybeans	GroupA-0030	0.68	0.03	0.46	0.01	1216.49	18.35	991	247	744	ENR
HB	6	2020	Soybeans	GroupA-0031	0.76	0.01	0.62	0.00	593.20	20.56	555	247	308	ENR
NH	6	2020	Soybeans	GroupA-0032	3.33	0.00	2.78	0.00	2271.12	89.93	181	247	-66	ENR
PTB	6	2020	Soybeans	GroupA-0033	1.95	0.00	1.82	0.00	1728.12	52.53	262	247	15	ENR
BG	6	2020	Soybeans	GroupA-0034	0.59	0.00	0.49	0.00	3938.74	15.91	1436	247	1189	ENR
BBEA	6	2020	Soybeans	GroupA-0035	0.69	0.02	0.60	0.00	4348.89	18.68	3036	247	2789	ENR
BS	6	2020	Soybeans	GroupA-0036	1.15	0.00	0.94	0.00	3688.53	31.03	748	247	501	ENR
AM	6	2021	Soybeans	GroupA-0037	0.79	0.04	0.63	0.00	1216.49	20.45	1730	246	1484	ENR
CF	6	2021	Soybeans	GroupA-0038	0.87	0.01	0.66	0.00	1790.97	22.66	1090	246	844	ENR
HB	6	2021	Soybeans	GroupA-0039	0.95	0.03	0.77	0.00	593.20	24.67	363	246	117	ENR
NH	6	2021	Soybeans	GroupA-0040	1.78	0.01	1.58	0.00	2271.12	46.04	51	246	-195	ENR
PE	6	2021	Soybeans	GroupA-0042	2.80	0.09	2.67	0.00	3050.40	72.44	938	246	692	ENR
PW	6	2021	Soybeans	GroupA-0043	1.36	0.01	1.09	0.00	3135.13	35.26	246	246	0	ENR
PL	6	2021	Soybeans	GroupA-0045	0.92	0.07	0.77	0.00	632.74	23.94	978	246	732	ENR
JL	6	2021	Soybeans	GroupA-0047	2.54	0.00	2.28	0.00	31086.42	65.91	884	246	638	ENR
BS	6	2021	Soybeans	GroupA-0048	2.77	0.00	2.58	0.00	3688.53	71.86	85	246	-161	ENR
6	AM	2013	Soybeans	GroupA-0049	2.02	0.01	1.63	0.00	1216.49	62.56	249	1748	-1499	ENR
HB	AM	2013	Soybeans	GroupA-0050	1.19	0.01	1.02	0.00	1351.32	36.78	558	1748	-1190	ENR
PTB	AM	2013	Soybeans	GroupA-0052	3.06	0.23	2.47	0.00	1901.85	94.47	289	1748	-1459	ENR
BG	AM	2013	Soybeans	GroupA-0053	0.85	0.06	0.68	0.00	4801.99	26.16	1438	1748	-310	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BBEA	AM	2013	Soybeans	GroupA-0054	1.12	0.04	0.93	0.00	5233.55	34.56	3081	1748	1333	ENR
AA	AM	2013	Soybeans	GroupA-0055	2.77	0.03	2.60	0.00	29801.06	85.62	378	1748	-1370	ENR
SP	AM	2013	Soybeans	GroupA-0056	2.44	0.09	2.33	0.00	32227.99	75.55	1994	1748	246	ENR
BS	AM	2013	Soybeans	GroupA-0057	0.92	0.07	0.69	0.00	4011.02	28.41	656	1748	-1092	ENR
6	AM	2014	Soybeans	GroupA-0058	1.37	0.11	1.12	0.00	1216.49	35.02	250	1748	-1498	ENR
HB	AM	2014	Soybeans	GroupA-0059	1.74	0.00	1.42	0.00	1351.32	44.55	555	1748	-1193	ENR
PB	AM	2014	Soybeans	GroupA-0060	0.87	0.13	0.75	0.00	3991.90	22.32	334	1748	-1414	ENR
PTB	AM	2014	Soybeans	GroupA-0061	1.41	0.04	1.19	0.00	1901.85	35.94	299	1748	-1449	ENR
PL	AM	2014	Soybeans	GroupA-0062	0.86	0.00	0.68	0.00	1797.09	21.88	974	1748	-774	ENR
PLB	AM	2014	Soybeans	GroupA-0063	1.93	0.00	1.60	0.00	2601.80	49.27	500	1748	-1248	ENR
BG	AM	2014	Soybeans	GroupA-0064	2.20	0.07	2.07	0.00	4801.99	56.29	1438	1748	-310	ENR
BBEA	AM	2014	Soybeans	GroupA-0065	2.23	0.07	2.10	0.00	5233.55	57.03	3084	1748	1336	ENR
BS	AM	2014	Soybeans	GroupA-0067	1.85	0.18	1.72	0.00	4011.02	47.24	656	1748	-1092	ENR
6	AM	2015	Soybeans	GroupA-0068	0.83	0.02	0.66	0.00	1216.49	40.47	251	1467	-1216	ENR
CF	AM	2015	Soybeans	GroupA-0069	1.38	0.00	1.25	0.00	2925.31	67.09	1097	1467	-370	ENR
PB	AM	2015	Soybeans	GroupA-0071	0.84	0.00	0.70	0.00	3991.90	40.94	327	1467	-1140	ENR
PTB	AM	2015	Soybeans	GroupA-0072	0.92	0.01	0.74	0.00	1901.85	44.44	303	1467	-1164	ENR
PL	AM	2015	Soybeans	GroupA-0073	0.84	0.04	0.67	0.00	1797.09	40.69	905	1467	-562	ENR
BG	AM	2015	Soybeans	GroupA-0075	1.30	0.00	1.19	0.00	4801.99	63.06	1384	1467	-83	ENR
BBEA	AM	2015	Soybeans	GroupA-0076	1.35	0.00	1.23	0.00	5233.55	65.36	2811	1467	1344	ENR
BS	AM	2015	Soybeans	GroupA-0077	0.96	0.01	0.78	0.00	4011.02	46.49	659	1467	-808	ENR
CF	AM	2019	Soybeans	GroupA-0078	0.82	0.00	0.66	0.00	2925.31	29.90	1095	745	350	ENR
PE	AM	2019	Soybeans	GroupA-0081	1.87	0.01	1.68	0.00	4256.93	67.97	942	745	197	ENR
PL	AM	2019	Soybeans	GroupA-0084	1.00	0.00	0.81	0.00	1797.09	36.20	968	745	223	ENR
PLB	AM	2019	Soybeans	GroupA-0085	1.48	0.11	1.22	0.00	2601.80	53.68	502	745	-243	ENR
JL	AM	2019	Soybeans	GroupA-0086	1.33	0.01	1.14	0.00	30699.89	48.39	888	745	143	ENR
6	AM	2020	Soybeans	GroupA-0087	1.95	0.02	1.60	0.00	1216.49	45.72	247	991	-744	ENR
HB	AM	2020	Soybeans	GroupA-0088	1.10	0.02	0.85	0.00	1351.32	25.77	555	991	-436	ENR
NH	AM	2020	Soybeans	GroupA-0089	3.56	0.04	2.94	0.00	1283.59	83.28	181	991	-810	ENR
PTB	AM	2020	Soybeans	GroupA-0090	3.00	0.01	2.90	0.00	1901.85	70.30	262	991	-729	ENR
BG	AM	2020	Soybeans	GroupA-0091	0.96	0.02	0.82	0.00	4801.99	22.43	1436	991	445	ENR
BBEA	AM	2020	Soybeans	GroupA-0092	0.88	0.01	0.77	0.00	5233.55	20.52	3036	991	2045	ENR
BS	AM	2020	Soybeans	GroupA-0093	1.22	0.02	0.99	0.00	4011.02	28.53	748	991	-243	ENR
6	AM	2021	Soybeans	GroupA-0094	1.49	0.08	1.18	0.00	1216.49	42.14	246	1730	-1484	ENR
CF	AM	2021	Soybeans	GroupA-0095	1.10	0.01	0.83	0.00	2925.31	31.15	1090	1730	-640	ENR
HB	AM	2021	Soybeans	GroupA-0096	1.09	0.00	0.84	0.00	1351.32	30.86	363	1730	-1367	ENR
NH	AM	2021	Soybeans	GroupA-0097	2.77	0.00	2.30	0.00	1283.59	78.55	51	1730	-1679	ENR
PW	AM	2021	Soybeans	GroupA-0100	2.07	0.04	1.78	0.00	4299.79	58.65	246	1730	-1484	ENR
PL	AM	2021	Soybeans	GroupA-0102	1.10	0.00	0.84	0.00	1797.09	31.15	978	1730	-752	ENR
JL	AM	2021	Soybeans	GroupA-0104	1.49	0.01	1.07	0.00	30699.89	42.10	884	1730	-846	ENR
BS	AM	2021	Soybeans	GroupA-0105	1.69	0.03	1.33	0.00	4011.02	47.77	85	1730	-1645	ENR
PL	CF	2012	Soybeans	GroupA-0107	1.50	0.06	1.23	0.00	1531.30	39.17	855	1099	-244	ENR
PLB	CF	2012	Soybeans	GroupA-0108	1.43	0.01	1.12	0.00	1177.89	37.45	502	1099	-597	ENR
CS	CF	2012	Soybeans	GroupA-0109	1.02	0.13	0.87	0.00	30336.27	26.74	1942	1099	843	ENR
SP	CF	2012	Soybeans	GroupA-0110	2.10	0.06	1.93	0.00	32684.73	54.97	1929	1099	830	ENR
6	CF	2015	Soybeans	GroupA-0111	1.70	0.04	1.34	0.00	1790.97	50.85	251	1097	-846	ENR
AM	CF	2015	Soybeans	GroupA-0112	1.79	0.04	1.68	0.00	2925.31	53.72	1467	1097	370	ENR
HB	CF	2015	Soybeans	GroupA-0113	2.44	0.00	2.30	0.00	1609.48	73.17	549	1097	-548	ENR
PB	CF	2015	Soybeans	GroupA-0114	1.86	0.06	1.64	0.00	1477.63	55.67	327	1097	-770	ENR
PTB	CF	2015	Soybeans	GroupA-0115	2.44	0.02	2.31	0.00	2125.67	73.13	303	1097	-794	ENR
PL	CF	2015	Soybeans	GroupA-0116	0.86	0.05	0.70	0.00	1531.30	25.77	905	1097	-192	ENR
PLB	CF	2015	Soybeans	GroupA-0117	0.84	0.01	0.65	0.00	1177.89	25.26	499	1097	-598	ENR
BG	CF	2015	Soybeans	GroupA-0118	2.67	0.01	2.60	0.00	3976.07	79.82	1384	1097	287	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BBEA	CF	2015	Soybeans	GroupA-0119	2.60	0.00	2.54	0.00	4282.54	77.70	2811	1097	1714	ENR
BS	CF	2015	Soybeans	GroupA-0120	2.24	0.01	2.10	0.00	3076.95	66.90	659	1097	-438	ENR
PB	CF	2016	Soybeans	GroupA-0122	3.05	0.01	2.03	0.00	1477.63	86.60	331	1083	-752	ENR
PTB	CF	2016	Soybeans	GroupA-0123	2.74	0.00	2.44	0.00	2125.67	77.72	297	1083	-786	ENR
BS	CF	2016	Soybeans	GroupA-0124	1.76	0.01	1.64	0.00	3076.95	50.07	655	1083	-428	ENR
AM	CF	2019	Soybeans	GroupA-0125	2.23	0.01	1.91	0.00	2925.31	64.29	745	1095	-350	ENR
PB	CF	2019	Soybeans	GroupA-0127	2.34	0.01	1.82	0.00	1477.63	67.67	278	1095	-817	ENR
PE	CF	2019	Soybeans	GroupA-0128	0.74	0.01	0.55	0.00	1470.34	21.44	942	1095	-153	ENR
PW	CF	2019	Soybeans	GroupA-0129	1.73	0.00	1.25	0.00	1380.51	49.83	259	1095	-836	ENR
PTB	CF	2019	Soybeans	GroupA-0130	3.36	0.00	2.38	0.00	2125.67	97.15	270	1095	-825	ENR
PL	CF	2019	Soybeans	GroupA-0131	0.68	0.06	0.53	0.00	1531.30	19.55	968	1095	-127	ENR
PLB	CF	2019	Soybeans	GroupA-0132	0.90	0.00	0.69	0.00	1177.89	25.88	502	1095	-593	ENR
JL	CF	2019	Soybeans	GroupA-0133	1.37	0.01	1.10	0.00	30895.46	39.44	888	1095	-207	ENR
6	CF	2021	Soybeans	GroupA-0134	3.06	0.00	2.76	0.00	1790.97	69.01	246	1090	-844	ENR
AM	CF	2021	Soybeans	GroupA-0135	1.48	0.01	1.17	0.00	2925.31	33.34	1730	1090	640	ENR
HB	CF	2021	Soybeans	GroupA-0136	0.89	0.01	0.67	0.00	1609.48	20.05	363	1090	-727	ENR
PE	CF	2021	Soybeans	GroupA-0139	1.69	0.00	1.39	0.00	1470.34	38.01	938	1090	-152	ENR
PW	CF	2021	Soybeans	GroupA-0140	1.67	0.01	1.39	0.00	1380.51	37.54	246	1090	-844	ENR
PL	CF	2021	Soybeans	GroupA-0142	1.14	0.00	0.86	0.00	1531.30	25.60	978	1090	-112	ENR
PLB	CF	2021	Soybeans	GroupA-0143	3.36	0.00	2.61	0.00	1177.89	75.70	491	1090	-599	ENR
JL	CF	2021	Soybeans	GroupA-0144	1.56	0.00	1.20	0.00	30895.46	35.02	884	1090	-206	ENR
BS	CF	2021	Soybeans	GroupA-0145	4.05	0.01	3.85	0.00	3076.95	91.17	85	1090	-1005	ENR
6	HB	2013	Soybeans	GroupA-0146	2.26	0.00	1.66	0.00	593.20	79.94	249	558	-309	ENR
AM	HB	2013	Soybeans	GroupA-0147	0.79	0.01	0.66	0.00	1351.32	27.87	1748	558	1190	ENR
BG	HB	2013	Soybeans	GroupA-0150	0.80	0.00	0.64	0.00	4415.29	28.14	1438	558	880	ENR
BBEA	HB	2013	Soybeans	GroupA-0151	0.64	0.00	0.54	0.00	4811.25	22.75	3081	558	2523	ENR
SP	HB	2013	Soybeans	GroupA-0153	2.03	0.01	1.95	0.00	32179.07	71.83	1994	558	1436	ENR
BS	HB	2013	Soybeans	GroupA-0154	1.01	0.00	0.77	0.00	3100.07	35.75	656	558	98	ENR
6	HB	2014	Soybeans	GroupA-0155	2.01	0.04	1.69	0.00	593.20	65.68	250	555	-305	ENR
AM	HB	2014	Soybeans	GroupA-0156	1.33	0.03	1.14	0.00	1351.32	43.47	1748	555	1193	ENR
PB	HB	2014	Soybeans	GroupA-0157	1.14	0.04	0.90	0.00	2853.21	37.22	334	555	-221	ENR
PTB	HB	2014	Soybeans	GroupA-0158	1.09	0.00	0.82	0.00	1152.69	35.60	299	555	-256	ENR
PL	HB	2014	Soybeans	GroupA-0159	1.46	0.01	1.18	0.00	1056.49	47.81	974	555	419	ENR
PLB	HB	2014	Soybeans	GroupA-0160	2.53	0.01	2.27	0.00	1650.52	82.77	500	555	-55	ENR
BG	HB	2014	Soybeans	GroupA-0161	1.65	0.05	1.45	0.00	4415.29	54.03	1438	555	883	ENR
BBEA	HB	2014	Soybeans	GroupA-0162	1.62	0.03	1.40	0.01	4811.25	53.05	3084	555	2529	ENR
BS	HB	2014	Soybeans	GroupA-0164	1.80	0.09	1.32	0.00	3100.07	58.86	656	555	101	ENR
BG	HB	2015	Soybeans	GroupA-0172	0.67	0.23	0.56	0.00	4415.29	67.08	1384	549	835	ENR
BBEA	HB	2015	Soybeans	GroupA-0173	0.74	0.08	0.61	0.00	4811.25	73.51	2811	549	2262	ENR
CF	HB	2016	Soybeans	GroupA-0175	1.29	0.08	1.07	0.00	1609.48	53.81	1083	181	902	ENR
PB	HB	2016	Soybeans	GroupA-0176	1.05	0.17	0.82	0.00	2853.21	43.77	331	181	150	ENR
BS	HB	2016	Soybeans	GroupA-0178	0.87	0.04	0.72	0.00	3100.07	36.32	655	181	474	ENR
PB	HB	2018	Soybeans	GroupA-0179	1.75	0.09	1.20	0.00	2853.21	48.87	327	184	143	ENR
PE	HB	2018	Soybeans	GroupA-0180	1.93	0.01	1.77	0.01	3020.77	54.10	941	184	757	ENR
PW	HB	2018	Soybeans	GroupA-0181	1.39	0.00	1.13	0.00	2989.69	38.99	257	184	73	ENR
BS	HB	2018	Soybeans	GroupA-0183	1.21	0.04	1.00	0.00	3100.07	33.82	752	184	568	ENR
AM	HB	2019	Soybeans	GroupA-0184	1.20	0.00	0.93	0.00	1351.32	63.71	745	174	571	ENR
CF	HB	2019	Soybeans	GroupA-0185	1.37	0.13	1.09	0.00	1609.48	73.19	1095	174	921	ENR
PB	HB	2019	Soybeans	GroupA-0186	1.19	0.07	0.91	0.00	2853.21	63.14	278	174	104	ENR
PL	HB	2019	Soybeans	GroupA-0190	1.27	0.04	0.99	0.00	1056.49	67.56	968	174	794	ENR
PLB	HB	2019	Soybeans	GroupA-0191	1.17	0.15	0.93	0.00	1650.52	62.06	502	174	328	ENR
JL	HB	2019	Soybeans	GroupA-0192	1.18	0.06	0.91	0.00	30527.42	62.80	888	174	714	ENR
6	HB	2020	Soybeans	GroupA-0193	1.95	0.02	1.46	0.00	593.20	60.76	247	555	-308	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
AM	HB	2020	Soybeans	GroupA-0194	1.45	0.13	1.07	0.01	1351.32	45.11	991	555	436	ENR
PTB	HB	2020	Soybeans	GroupA-0196	2.10	0.04	1.84	0.00	1152.69	65.28	262	555	-293	ENR
BG	HB	2020	Soybeans	GroupA-0197	1.21	0.19	0.91	0.00	4415.29	37.74	1436	555	881	ENR
BBEA	HB	2020	Soybeans	GroupA-0198	1.14	0.21	0.95	0.00	4811.25	35.49	3036	555	2481	ENR
BS	HB	2020	Soybeans	GroupA-0199	0.89	0.38	0.70	0.00	3100.07	27.67	748	555	193	ENR
6	HB	2021	Soybeans	GroupA-0200	1.15	0.02	0.96	0.00	593.20	31.84	246	363	-117	ENR
AM	HB	2021	Soybeans	GroupA-0201	0.65	0.06	0.50	0.00	1351.32	17.82	1730	363	1367	ENR
CF	HB	2021	Soybeans	GroupA-0202	0.80	0.01	0.62	0.00	1609.48	22.18	1090	363	727	ENR
NH	HB	2021	Soybeans	GroupA-0203	1.90	0.27	1.59	0.00	2580.18	52.40	51	363	-312	ENR
PE	HB	2021	Soybeans	GroupA-0205	3.22	0.09	3.09	0.00	3020.77	88.90	938	363	575	ENR
PW	HB	2021	Soybeans	GroupA-0206	0.76	0.10	0.57	0.00	2989.69	20.88	246	363	-117	ENR
PTB	HB	2021	Soybeans	GroupA-0207	2.46	0.02	2.05	0.01	1152.69	67.77	251	363	-112	ENR
PL	HB	2021	Soybeans	GroupA-0208	0.85	0.00	0.68	0.00	1056.49	23.52	978	363	615	ENR
JL	HB	2021	Soybeans	GroupA-0210	2.40	0.00	2.19	0.00	30527.42	66.23	884	363	521	ENR
BS	HB	2021	Soybeans	GroupA-0211	1.60	0.01	1.28	0.00	3100.07	44.18	85	363	-278	ENR
6	NH	2013	Soybeans	GroupA-0212	2.27	0.19	1.54	0.00	2271.12	90.94	249	173	76	ENR
AM	NH	2013	Soybeans	GroupA-0213	1.31	0.25	0.92	0.00	1283.59	52.61	1748	173	1575	ENR
HB	NH	2013	Soybeans	GroupA-0214	1.15	0.13	0.85	0.00	2580.18	46.20	558	173	385	ENR
PTB	NH	2013	Soybeans	GroupA-0215	1.91	0.20	1.52	0.00	3164.44	76.67	289	173	116	ENR
BG	NH	2013	Soybeans	GroupA-0216	1.89	0.04	1.50	0.00	4995.12	75.59	1438	173	1265	ENR
BBEA	NH	2013	Soybeans	GroupA-0217	1.37	0.03	0.99	0.00	5431.98	54.86	3081	173	2908	ENR
SP	NH	2013	Soybeans	GroupA-0219	1.85	0.00	1.66	0.00	32824.38	74.10	1994	173	1821	ENR
BS	NH	2013	Soybeans	GroupA-0220	1.10	0.44	0.80	0.00	5253.94	44.17	656	173	483	ENR
6	NH	2020	Soybeans	GroupA-0221	2.82	0.10	2.56	0.00	2271.12	86.75	247	181	66	ENR
AM	NH	2020	Soybeans	GroupA-0222	1.46	0.05	1.04	0.01	1283.59	44.82	991	181	810	ENR
HB	NH	2020	Soybeans	GroupA-0223	1.04	0.27	0.76	0.00	2580.18	32.02	555	181	374	ENR
PTB	NH	2020	Soybeans	GroupA-0224	1.77	0.08	1.54	0.00	3164.44	54.43	262	181	81	ENR
BG	NH	2020	Soybeans	GroupA-0225	1.52	0.02	1.07	0.00	4995.12	46.78	1436	181	1255	ENR
BBEA	NH	2020	Soybeans	GroupA-0226	1.22	0.02	0.85	0.00	5431.98	37.57	3036	181	2855	ENR
BS	NH	2020	Soybeans	GroupA-0227	1.44	0.33	1.17	0.00	5253.94	44.34	748	181	567	ENR
6	NH	2021	Soybeans	GroupA-0228	1.45	0.49	1.26	0.00	2271.12	57.07	246	51	195	ENR
AM	NH	2021	Soybeans	GroupA-0229	0.83	0.26	0.58	0.00	1283.59	32.85	1730	51	1679	ENR
CF	NH	2021	Soybeans	GroupA-0230	1.59	0.02	1.32	0.00	4061.52	62.55	1090	51	1039	ENR
HB	NH	2021	Soybeans	GroupA-0231	1.71	0.39	1.43	0.00	2580.18	67.39	363	51	312	ENR
PW	NH	2021	Soybeans	GroupA-0234	0.86	0.04	0.69	0.00	5399.77	33.88	246	51	195	ENR
PL	NH	2021	Soybeans	GroupA-0236	1.57	0.20	1.36	0.00	2690.61	62.04	978	51	927	ENR
JL	NH	2021	Soybeans	GroupA-0238	1.67	0.00	1.41	0.00	31398.77	65.98	884	51	833	ENR
BS	NH	2021	Soybeans	GroupA-0239	2.50	0.00	2.33	0.00	5253.94	98.67	85	51	34	ENR
CF	PB	2012	Soybeans	GroupA-0240	1.23	0.11	1.06	0.00	1477.63	38.47	1099	335	764	ENR
PL	PB	2012	Soybeans	GroupA-0241	1.06	0.05	0.82	0.00	2233.71	33.07	855	335	520	ENR
PLB	PB	2012	Soybeans	GroupA-0242	1.73	0.01	1.41	0.00	1437.03	54.05	502	335	167	ENR
CS	PB	2012	Soybeans	GroupA-0243	2.75	0.12	2.55	0.00	31668.37	86.03	1942	335	1607	ENR
6	PB	2014	Soybeans	GroupA-0245	3.38	0.00	3.12	0.00	2775.62	96.82	250	334	-84	ENR
AM	PB	2014	Soybeans	GroupA-0246	1.26	0.05	0.97	0.00	3991.90	36.25	1748	334	1414	ENR
HB	PB	2014	Soybeans	GroupA-0247	2.83	0.01	1.57	0.00	2853.21	81.12	555	334	221	ENR
PTB	PB	2014	Soybeans	GroupA-0248	1.23	0.02	1.04	0.00	3582.30	35.24	299	334	-35	ENR
PL	PB	2014	Soybeans	GroupA-0249	1.41	0.04	0.97	0.00	2233.71	40.36	974	334	640	ENR
PLB	PB	2014	Soybeans	GroupA-0250	1.01	0.06	0.84	0.00	1437.03	29.10	500	334	166	ENR
BG	PB	2014	Soybeans	GroupA-0251	1.74	0.09	1.57	0.00	3001.92	49.85	1438	334	1104	ENR
BBEA	PB	2014	Soybeans	GroupA-0252	1.97	0.03	1.79	0.00	3203.03	56.58	3084	334	2750	ENR
BS	PB	2014	Soybeans	GroupA-0254	2.11	0.02	1.91	0.00	4411.96	60.49	656	334	322	ENR
AM	PB	2015	Soybeans	GroupA-0256	0.90	0.03	0.77	0.00	3991.90	44.74	1467	327	1140	ENR
CF	PB	2015	Soybeans	GroupA-0257	1.25	0.01	1.02	0.00	1477.63	61.89	1097	327	770	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
HB	PB	2015	Soybeans	GroupA-0258	1.51	0.02	1.31	0.00	2853.21	74.75	549	327	222	ENR
PLB	PB	2015	Soybeans	GroupA-0261	1.08	0.11	0.90	0.00	1437.03	53.55	499	327	172	ENR
BG	PB	2015	Soybeans	GroupA-0262	1.33	0.03	1.19	0.00	3001.92	65.83	1384	327	1057	ENR
BBEA	PB	2015	Soybeans	GroupA-0263	1.05	0.01	0.90	0.00	3203.03	52.12	2811	327	2484	ENR
BS	PB	2015	Soybeans	GroupA-0264	1.01	0.00	0.85	0.00	4411.96	50.08	659	327	332	ENR
CF	PB	2016	Soybeans	GroupA-0265	0.98	0.01	0.76	0.00	1477.63	37.39	1083	331	752	ENR
PTB	PB	2016	Soybeans	GroupA-0267	0.85	0.01	0.65	0.00	3582.30	32.55	297	331	-34	ENR
BS	PB	2016	Soybeans	GroupA-0268	1.97	0.03	1.79	0.00	4411.96	75.49	655	331	324	ENR
HB	PB	2018	Soybeans	GroupA-0269	1.30	0.06	1.02	0.00	2853.21	45.15	184	327	-143	ENR
PE	PB	2018	Soybeans	GroupA-0270	1.92	0.00	1.44	0.01	573.60	66.77	941	327	614	ENR
BS	PB	2018	Soybeans	GroupA-0273	1.61	0.02	1.35	0.00	4411.96	55.94	752	327	425	ENR
CF	PB	2019	Soybeans	GroupA-0275	1.99	0.12	1.69	0.00	1477.63	97.89	1095	278	817	ENR
PE	PB	2019	Soybeans	GroupA-0277	1.30	0.20	1.02	0.00	573.60	64.12	942	278	664	ENR
PW	PB	2019	Soybeans	GroupA-0278	1.43	0.04	1.14	0.00	1133.42	70.38	259	278	-19	ENR
PLB	PB	2019	Soybeans	GroupA-0281	1.45	0.25	1.21	0.00	1437.03	71.56	502	278	224	ENR
JL	PB	2019	Soybeans	GroupA-0282	1.77	0.02	1.49	0.00	32178.80	87.15	888	278	610	ENR
6	PB	2021	Soybeans	GroupA-0283	2.49	0.58	2.24	0.00	2775.62	88.62	246	246	0	ENR
AM	PB	2021	Soybeans	GroupA-0284	1.84	0.03	1.55	0.00	3991.90	65.72	1730	246	1484	ENR
PE	PB	2021	Soybeans	GroupA-0288	1.44	0.48	1.14	0.00	573.60	51.18	938	246	692	ENR
PTB	PB	2021	Soybeans	GroupA-0290	2.33	0.34	2.02	0.00	3582.30	82.93	251	246	5	ENR
PLB	PB	2021	Soybeans	GroupA-0292	2.50	0.27	2.13	0.00	1437.03	88.98	491	246	245	ENR
HB	PE	2018	Soybeans	GroupA-0295	1.19	0.04	1.00	0.00	3020.77	25.48	184	941	-757	ENR
PB	PE	2018	Soybeans	GroupA-0296	3.11	0.00	2.28	0.00	573.60	66.92	327	941	-614	ENR
PW	PE	2018	Soybeans	GroupA-0297	1.77	0.00	1.44	0.00	602.45	38.03	257	941	-684	ENR
PTB	PE	2018	Soybeans	GroupA-0298	2.32	0.01	2.18	0.00	3583.16	49.85	289	941	-652	ENR
BS	PE	2018	Soybeans	GroupA-0299	1.99	0.00	1.82	0.00	4129.23	42.70	752	941	-189	ENR
AM	PE	2019	Soybeans	GroupA-0300	3.23	0.23	2.73	0.00	4256.93	92.34	745	942	-197	ENR
CF	PE	2019	Soybeans	GroupA-0301	0.89	0.06	0.70	0.00	1470.34	25.48	1095	942	153	ENR
PB	PE	2019	Soybeans	GroupA-0303	1.85	0.10	1.41	0.00	573.60	52.92	278	942	-664	ENR
PL	PE	2019	Soybeans	GroupA-0306	1.17	0.11	0.93	0.00	2576.96	33.33	968	942	26	ENR
PLB	PE	2019	Soybeans	GroupA-0307	0.88	0.12	0.74	0.00	1832.05	25.06	502	942	-440	ENR
JL	PE	2019	Soybeans	GroupA-0308	1.79	0.00	1.38	0.00	31805.51	51.23	888	942	-54	ENR
6	PE	2021	Soybeans	GroupA-0309	3.90	0.30	3.60	0.00	3050.40	82.77	246	938	-692	ENR
AM	PE	2021	Soybeans	GroupA-0310	1.58	0.35	1.42	0.00	4256.93	33.49	1730	938	792	ENR
CF	PE	2021	Soybeans	GroupA-0311	1.92	0.17	1.21	0.00	1470.34	40.80	1090	938	152	ENR
HB	PE	2021	Soybeans	GroupA-0312	1.33	0.00	0.91	0.00	3020.77	28.20	363	938	-575	ENR
PB	PE	2021	Soybeans	GroupA-0314	3.35	0.33	2.50	0.00	573.60	71.05	246	938	-692	ENR
PW	PE	2021	Soybeans	GroupA-0315	3.40	0.33	2.73	0.00	602.45	72.22	246	938	-692	ENR
PL	PE	2021	Soybeans	GroupA-0317	1.71	0.12	1.44	0.00	2576.96	36.27	978	938	40	ENR
PLB	PE	2021	Soybeans	GroupA-0318	4.00	0.11	3.56	0.00	1832.05	84.91	491	938	-447	ENR
JL	PE	2021	Soybeans	GroupA-0319	2.51	0.24	1.74	0.00	31805.51	53.39	884	938	-54	ENR
HB	PW	2018	Soybeans	GroupA-0321	2.32	0.29	1.81	0.00	2989.69	50.78	184	257	-73	ENR
PE	PW	2018	Soybeans	GroupA-0323	0.81	0.08	0.58	0.01	602.45	17.65	941	257	684	ENR
PTB	PW	2018	Soybeans	GroupA-0324	1.85	0.05	1.64	0.00	3360.13	40.45	289	257	32	ENR
BS	PW	2018	Soybeans	GroupA-0325	1.30	0.12	1.16	0.00	3638.27	28.48	752	257	495	ENR
AM	PW	2019	Soybeans	GroupA-0326	1.21	0.01	0.99	0.00	4299.79	33.62	745	259	486	ENR
CF	PW	2019	Soybeans	GroupA-0327	0.60	0.04	0.49	0.00	1380.51	16.51	1095	259	836	ENR
PE	PW	2019	Soybeans	GroupA-0330	0.65	0.00	0.53	0.00	602.45	17.91	942	259	683	ENR
PL	PW	2019	Soybeans	GroupA-0332	0.68	0.05	0.55	0.00	2757.07	18.74	968	259	709	ENR
PLB	PW	2019	Soybeans	GroupA-0333	0.91	0.10	0.70	0.00	2110.84	25.14	502	259	243	ENR
JL	PW	2019	Soybeans	GroupA-0334	0.72	0.01	0.54	0.00	31235.93	19.89	888	259	629	ENR
6	PW	2021	Soybeans	GroupA-0335	1.76	0.09	1.34	0.00	3135.13	40.12	246	246	0	ENR
AM	PW	2021	Soybeans	GroupA-0336	0.98	0.01	0.71	0.00	4299.79	22.20	1730	246	1484	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CF	PW	2021	Soybeans	GroupA-0337	0.77	0.01	0.62	0.00	1380.51	17.47	1090	246	844	ENR
HB	PW	2021	Soybeans	GroupA-0338	0.92	0.01	0.77	0.00	2989.69	20.93	363	246	117	ENR
PE	PW	2021	Soybeans	GroupA-0341	1.97	0.04	1.79	0.00	602.45	44.77	938	246	692	ENR
PTB	PW	2021	Soybeans	GroupA-0342	1.44	0.04	1.13	0.01	3360.13	32.81	251	246	5	ENR
PL	PW	2021	Soybeans	GroupA-0343	0.85	0.03	0.66	0.00	2757.07	19.44	978	246	732	ENR
JL	PW	2021	Soybeans	GroupA-0345	0.73	0.03	0.61	0.00	31235.93	16.57	884	246	638	ENR
AM	PTB	2013	Soybeans	GroupA-0348	0.81	0.00	0.70	0.00	1901.85	22.38	1748	289	1459	ENR
HB	PTB	2013	Soybeans	GroupA-0349	0.99	0.00	0.84	0.00	1152.69	27.07	558	289	269	ENR
NH	PTB	2013	Soybeans	GroupA-0350	3.51	0.07	2.57	0.00	3164.44	96.41	173	289	-116	ENR
BG	PTB	2013	Soybeans	GroupA-0351	0.67	0.13	0.55	0.00	5528.32	18.40	1438	289	1149	ENR
BBEA	PTB	2013	Soybeans	GroupA-0352	1.14	0.11	1.03	0.00	5911.78	31.17	3081	289	2792	ENR
AA	PTB	2013	Soybeans	GroupA-0353	3.10	0.02	2.99	0.00	28506.53	85.11	378	289	89	ENR
SP	PTB	2013	Soybeans	GroupA-0354	2.72	0.06	2.65	0.00	31037.05	74.58	1994	289	1705	ENR
BS	PTB	2013	Soybeans	GroupA-0355	1.99	0.03	1.82	0.00	2114.72	54.73	656	289	367	ENR
6	PTB	2014	Soybeans	GroupA-0356	1.71	0.07	1.48	0.00	1728.12	50.88	250	299	-49	ENR
AM	PTB	2014	Soybeans	GroupA-0357	1.11	0.08	0.96	0.00	1901.85	33.03	1748	299	1449	ENR
HB	PTB	2014	Soybeans	GroupA-0358	2.22	0.00	1.08	0.00	1152.69	66.16	555	299	256	ENR
PB	PTB	2014	Soybeans	GroupA-0359	0.84	0.09	0.71	0.00	3582.30	24.90	334	299	35	ENR
PL	PTB	2014	Soybeans	GroupA-0360	1.19	0.02	0.87	0.00	2192.01	35.48	974	299	675	ENR
PLB	PTB	2014	Soybeans	GroupA-0361	1.65	0.15	1.32	0.00	2652.61	49.09	500	299	201	ENR
BG	PTB	2014	Soybeans	GroupA-0362	1.62	0.09	1.47	0.00	5528.32	48.20	1438	299	1139	ENR
BBEA	PTB	2014	Soybeans	GroupA-0363	1.69	0.03	1.50	0.00	5911.78	50.23	3084	299	2785	ENR
SP	PTB	2014	Soybeans	GroupA-0364	3.32	0.00	2.76	0.00	31037.05	98.90	1993	299	1694	ENR
BS	PTB	2014	Soybeans	GroupA-0365	2.12	0.04	1.92	0.00	2114.72	63.02	656	299	357	ENR
6	PTB	2015	Soybeans	GroupA-0366	0.98	0.03	0.78	0.00	1728.12	56.05	251	303	-52	ENR
AM	PTB	2015	Soybeans	GroupA-0367	1.00	0.00	0.82	0.00	1901.85	57.24	1467	303	1164	ENR
CF	PTB	2015	Soybeans	GroupA-0368	1.13	0.09	0.98	0.00	2125.67	64.19	1097	303	794	ENR
HB	PTB	2015	Soybeans	GroupA-0369	0.70	0.05	0.56	0.00	1152.69	39.82	549	303	246	ENR
PB	PTB	2015	Soybeans	GroupA-0370	0.83	0.02	0.67	0.00	3582.30	47.36	327	303	24	ENR
PL	PTB	2015	Soybeans	GroupA-0371	1.24	0.05	0.96	0.00	2192.01	70.66	905	303	602	ENR
BG	PTB	2015	Soybeans	GroupA-0373	1.15	0.04	1.00	0.00	5528.32	65.45	1384	303	1081	ENR
BBEA	PTB	2015	Soybeans	GroupA-0374	1.16	0.05	1.01	0.00	5911.78	66.17	2811	303	2508	ENR
BS	PTB	2015	Soybeans	GroupA-0375	1.22	0.00	0.97	0.00	2114.72	69.58	659	303	356	ENR
CF	PTB	2016	Soybeans	GroupA-0376	0.87	0.03	0.71	0.00	2125.67	30.04	1083	297	786	ENR
BS	PTB	2016	Soybeans	GroupA-0379	1.54	0.02	1.29	0.00	2114.72	53.02	655	297	358	ENR
HB	PTB	2018	Soybeans	GroupA-0380	1.42	0.03	1.02	0.00	1152.69	35.44	184	289	-105	ENR
PB	PTB	2018	Soybeans	GroupA-0381	4.00	0.01	2.64	0.00	3582.30	99.87	327	289	38	ENR
PE	PTB	2018	Soybeans	GroupA-0382	1.18	0.01	1.00	0.01	3583.16	29.52	941	289	652	ENR
PW	PTB	2018	Soybeans	GroupA-0383	2.20	0.01	1.85	0.00	3360.13	54.95	257	289	-32	ENR
BS	PTB	2018	Soybeans	GroupA-0384	1.81	0.01	1.61	0.00	2114.72	45.17	752	289	463	ENR
HB	PTB	2020	Soybeans	GroupA-0396	1.80	0.00	1.31	0.00	1152.69	97.68	555	262	293	ENR
BBEA	PTB	2020	Soybeans	GroupA-0399	1.85	0.08	1.74	0.00	5911.78	99.97	3036	262	2774	ENR
BS	PTB	2020	Soybeans	GroupA-0400	1.46	0.01	1.03	0.00	2114.72	78.91	748	262	486	ENR
6	PTB	2021	Soybeans	GroupA-0401	1.90	0.04	1.45	0.00	1728.12	98.33	246	251	-5	ENR
AM	PTB	2021	Soybeans	GroupA-0402	1.85	0.01	1.55	0.00	1901.85	95.58	1730	251	1479	ENR
PL	PTB	2021	Soybeans	GroupA-0409	1.79	0.01	1.47	0.00	2192.01	92.52	978	251	727	ENR
CF	PL	2012	Soybeans	GroupA-0413	0.74	0.02	0.56	0.00	1531.30	20.56	1099	855	244	ENR
PB	PL	2012	Soybeans	GroupA-0414	3.53	0.08	2.85	0.00	2233.71	98.06	335	855	-520	ENR
PLB	PL	2012	Soybeans	GroupA-0415	0.77	0.10	0.60	0.00	809.82	21.48	502	855	-353	ENR
CS	PL	2012	Soybeans	GroupA-0416	0.97	0.01	0.75	0.00	30903.15	26.85	1942	855	1087	ENR
SP	PL	2012	Soybeans	GroupA-0417	1.47	0.06	1.23	0.00	33228.68	40.71	1929	855	1074	ENR
6	PL	2014	Soybeans	GroupA-0418	1.61	0.01	1.37	0.00	632.74	40.62	250	974	-724	ENR
AM	PL	2014	Soybeans	GroupA-0419	0.86	0.03	0.67	0.00	1797.09	21.75	1748	974	774	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
HB	PL	2014	Soybeans	GroupA-0420	2.09	0.00	1.60	0.00	1056.49	52.75	555	974	-419	ENR
PB	PL	2014	Soybeans	GroupA-0421	0.86	0.05	0.74	0.00	2233.71	21.60	334	974	-640	ENR
PTB	PL	2014	Soybeans	GroupA-0422	1.30	0.02	1.11	0.00	2192.01	32.94	299	974	-675	ENR
PLB	PL	2014	Soybeans	GroupA-0423	1.24	0.01	0.94	0.00	809.82	31.40	500	974	-474	ENR
BG	PL	2014	Soybeans	GroupA-0424	2.34	0.03	2.23	0.00	3360.23	58.99	1438	974	464	ENR
BBEA	PL	2014	Soybeans	GroupA-0425	2.44	0.03	2.32	0.01	3759.77	61.46	3084	974	2110	ENR
BS	PL	2014	Soybeans	GroupA-0427	2.13	0.02	1.97	0.00	3972.53	53.66	656	974	-318	ENR
6	PL	2015	Soybeans	GroupA-0428	0.86	0.01	0.67	0.00	632.74	29.47	251	905	-654	ENR
AM	PL	2015	Soybeans	GroupA-0429	1.08	0.00	0.85	0.00	1797.09	36.94	1467	905	562	ENR
CF	PL	2015	Soybeans	GroupA-0430	0.89	0.01	0.71	0.00	1531.30	30.18	1097	905	192	ENR
HB	PL	2015	Soybeans	GroupA-0431	1.48	0.08	1.29	0.00	1056.49	50.48	549	905	-356	ENR
PB	PL	2015	Soybeans	GroupA-0432	1.33	0.01	1.14	0.00	2233.71	45.19	327	905	-578	ENR
PTB	PL	2015	Soybeans	GroupA-0433	1.23	0.12	0.96	0.00	2192.01	42.06	303	905	-602	ENR
PLB	PL	2015	Soybeans	GroupA-0434	1.24	0.09	0.97	0.00	809.82	42.26	499	905	-406	ENR
BG	PL	2015	Soybeans	GroupA-0435	2.11	0.03	1.99	0.00	3360.23	71.80	1384	905	479	ENR
BBEA	PL	2015	Soybeans	GroupA-0436	2.07	0.06	1.96	0.00	3759.77	70.69	2811	905	1906	ENR
BS	PL	2015	Soybeans	GroupA-0437	1.46	0.00	1.24	0.00	3972.53	49.63	659	905	-246	ENR
AM	PL	2019	Soybeans	GroupA-0438	1.62	0.05	1.20	0.00	1797.09	50.15	745	968	-223	ENR
CF	PL	2019	Soybeans	GroupA-0439	0.62	0.11	0.48	0.00	1531.30	19.12	1095	968	127	ENR
HB	PL	2019	Soybeans	GroupA-0440	2.51	0.33	2.06	0.00	1056.49	77.78	174	968	-794	ENR
PB	PL	2019	Soybeans	GroupA-0441	2.99	0.22	2.43	0.00	2233.71	92.74	278	968	-690	ENR
PE	PL	2019	Soybeans	GroupA-0442	1.50	0.11	1.25	0.00	2576.96	46.61	942	968	-26	ENR
PW	PL	2019	Soybeans	GroupA-0443	2.43	0.16	1.75	0.00	2757.07	75.40	259	968	-709	ENR
PLB	PL	2019	Soybeans	GroupA-0445	0.68	0.09	0.52	0.00	809.82	21.08	502	968	-466	ENR
JL	PL	2019	Soybeans	GroupA-0446	1.20	0.01	0.93	0.00	31562.14	37.16	888	968	-80	ENR
6	PL	2021	Soybeans	GroupA-0447	2.03	0.02	1.70	0.00	632.74	44.09	246	978	-732	ENR
AM	PL	2021	Soybeans	GroupA-0448	1.56	0.00	1.25	0.00	1797.09	33.95	1730	978	752	ENR
CF	PL	2021	Soybeans	GroupA-0449	1.23	0.01	1.02	0.00	1531.30	26.75	1090	978	112	ENR
HB	PL	2021	Soybeans	GroupA-0450	1.07	0.02	0.91	0.00	1056.49	23.28	363	978	-615	ENR
PE	PL	2021	Soybeans	GroupA-0453	1.70	0.00	1.28	0.00	2576.96	36.77	938	978	-40	ENR
PW	PL	2021	Soybeans	GroupA-0454	1.24	0.10	0.95	0.00	2757.07	26.87	246	978	-732	ENR
JL	PL	2021	Soybeans	GroupA-0457	2.37	0.01	2.02	0.00	31562.14	51.39	884	978	-94	ENR
BS	PL	2021	Soybeans	GroupA-0458	3.74	0.04	3.43	0.00	3972.53	81.10	85	978	-893	ENR
CF	PLB	2012	Soybeans	GroupA-0459	0.54	0.01	0.45	0.00	1177.89	15.25	1099	502	597	ENR
PL	PLB	2012	Soybeans	GroupA-0461	0.59	0.04	0.46	0.00	809.82	16.53	855	502	353	ENR
CS	PLB	2012	Soybeans	GroupA-0462	1.05	0.00	0.88	0.00	31271.27	29.57	1942	502	1440	ENR
SP	PLB	2012	Soybeans	GroupA-0463	1.53	0.00	1.36	0.00	33608.76	42.86	1929	502	1427	ENR
6	PLB	2014	Soybeans	GroupA-0464	2.28	0.02	1.90	0.00	1403.96	60.33	250	500	-250	ENR
AM	PLB	2014	Soybeans	GroupA-0465	0.99	0.05	0.79	0.00	2601.80	26.33	1748	500	1248	ENR
HB	PLB	2014	Soybeans	GroupA-0466	2.17	0.01	1.62	0.00	1650.52	57.52	555	500	55	ENR
PB	PLB	2014	Soybeans	GroupA-0467	0.92	0.13	0.79	0.00	1437.03	24.24	334	500	-166	ENR
PTB	PLB	2014	Soybeans	GroupA-0468	1.42	0.04	1.20	0.00	2652.61	37.53	299	500	-201	ENR
PL	PLB	2014	Soybeans	GroupA-0469	0.91	0.06	0.68	0.00	809.82	24.20	974	500	474	ENR
BG	PLB	2014	Soybeans	GroupA-0470	2.16	0.08	1.97	0.00	2941.78	57.10	1438	500	938	ENR
BBEA	PLB	2014	Soybeans	GroupA-0471	2.40	0.07	2.24	0.00	3296.50	63.46	3084	500	2584	ENR
BS	PLB	2014	Soybeans	GroupA-0473	2.04	0.07	1.84	0.00	4109.93	53.87	656	500	156	ENR
6	PLB	2015	Soybeans	GroupA-0474	1.10	0.00	0.81	0.00	1403.96	48.18	251	499	-248	ENR
AM	PLB	2015	Soybeans	GroupA-0475	0.70	0.17	0.59	0.00	2601.80	30.93	1467	499	968	ENR
CF	PLB	2015	Soybeans	GroupA-0476	1.33	0.10	1.04	0.00	1177.89	58.72	1097	499	598	ENR
HB	PLB	2015	Soybeans	GroupA-0477	1.08	0.11	0.93	0.00	1650.52	47.70	549	499	50	ENR
PB	PLB	2015	Soybeans	GroupA-0478	0.94	0.05	0.80	0.00	1437.03	41.37	327	499	-172	ENR
PTB	PLB	2015	Soybeans	GroupA-0479	1.09	0.00	0.94	0.00	2652.61	47.98	303	499	-196	ENR
PL	PLB	2015	Soybeans	GroupA-0480	1.38	0.03	1.07	0.00	809.82	60.80	905	499	406	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BG	PLB	2015	Soybeans	GroupA-0481	1.56	0.07	1.37	0.00	2941.78	68.69	1384	499	885	ENR
BBEA	PLB	2015	Soybeans	GroupA-0482	1.46	0.06	1.27	0.00	3296.50	64.20	2811	499	2312	ENR
BS	PLB	2015	Soybeans	GroupA-0483	0.98	0.03	0.78	0.00	4109.93	42.96	659	499	160	ENR
AM	PLB	2019	Soybeans	GroupA-0484	1.39	0.04	1.03	0.00	2601.80	49.66	745	502	243	ENR
CF	PLB	2019	Soybeans	GroupA-0485	1.25	0.01	0.94	0.00	1177.89	44.50	1095	502	593	ENR
HB	PLB	2019	Soybeans	GroupA-0486	2.74	0.13	2.28	0.00	1650.52	97.58	174	502	-328	ENR
PE	PLB	2019	Soybeans	GroupA-0488	1.99	0.01	1.68	0.00	1832.05	70.84	942	502	440	ENR
PL	PLB	2019	Soybeans	GroupA-0491	1.07	0.27	0.78	0.00	809.82	38.02	968	502	466	ENR
JL	PLB	2019	Soybeans	GroupA-0492	1.87	0.02	1.51	0.00	31878.96	66.79	888	502	386	ENR
6	PLB	2021	Soybeans	GroupA-0493	2.50	0.04	2.20	0.00	1403.96	60.49	246	491	-245	ENR
AM	PLB	2021	Soybeans	GroupA-0494	1.45	0.08	1.19	0.00	2601.80	35.03	1730	491	1239	ENR
CF	PLB	2021	Soybeans	GroupA-0495	1.51	0.04	1.14	0.00	1177.89	36.60	1090	491	599	ENR
HB	PLB	2021	Soybeans	GroupA-0496	1.56	0.25	1.08	0.00	1650.52	37.63	363	491	-128	ENR
PE	PLB	2021	Soybeans	GroupA-0499	1.75	0.00	1.26	0.00	1832.05	42.35	938	491	447	ENR
PW	PLB	2021	Soybeans	GroupA-0500	2.54	0.23	1.99	0.00	2110.84	61.36	246	491	-245	ENR
PL	PLB	2021	Soybeans	GroupA-0502	1.52	0.02	1.01	0.00	809.82	36.63	978	491	487	ENR
JL	PLB	2021	Soybeans	GroupA-0503	2.97	0.01	2.53	0.00	31878.96	71.88	884	491	393	ENR
AM	BG	2013	Soybeans	GroupA-0506	1.43	0.14	1.16	0.00	4801.99	41.09	1748	1438	310	ENR
HB	BG	2013	Soybeans	GroupA-0507	1.54	0.05	1.30	0.00	4415.29	44.14	558	1438	-880	ENR
PTB	BG	2013	Soybeans	GroupA-0509	2.25	0.02	1.76	0.00	5528.32	64.40	289	1438	-1149	ENR
BBEA	BG	2013	Soybeans	GroupA-0510	1.25	0.30	1.07	0.00	438.12	35.84	3081	1438	1643	ENR
SP	BG	2013	Soybeans	GroupA-0512	2.56	0.05	2.35	0.00	36543.85	73.53	1994	1438	556	ENR
BS	BG	2013	Soybeans	GroupA-0513	1.78	0.00	1.45	0.00	7029.70	50.96	656	1438	-782	ENR
PTB	BG	2014	Soybeans	GroupA-0518	1.41	0.04	1.23	0.00	5528.32	80.27	299	1438	-1139	ENR
BBEA	BG	2014	Soybeans	GroupA-0521	0.71	0.03	0.58	0.00	438.12	40.80	3084	1438	1646	ENR
BS	BG	2014	Soybeans	GroupA-0523	0.87	0.00	0.71	0.00	7029.70	49.45	656	1438	-782	ENR
BBEA	BG	2015	Soybeans	GroupA-0532	0.52	0.14	0.43	0.00	438.12	64.07	2811	1384	1427	ENR
AM	BG	2020	Soybeans	GroupA-0535	1.29	0.00	1.00	0.00	4801.99	34.42	991	1436	-445	ENR
HB	BG	2020	Soybeans	GroupA-0536	1.37	0.01	1.12	0.00	4415.29	36.48	555	1436	-881	ENR
PTB	BG	2020	Soybeans	GroupA-0538	2.12	0.00	1.92	0.00	5528.32	56.46	262	1436	-1174	ENR
BBEA	BG	2020	Soybeans	GroupA-0539	0.83	0.10	0.67	0.00	438.12	22.14	3036	1436	1600	ENR
BS	BG	2020	Soybeans	GroupA-0540	2.20	0.00	1.82	0.00	7029.70	58.58	748	1436	-688	ENR
AM	BBEA	2013	Soybeans	GroupA-0542	1.18	0.05	0.95	0.00	5233.55	42.75	1748	3081	-1333	ENR
HB	BBEA	2013	Soybeans	GroupA-0543	1.11	0.01	0.89	0.00	4811.25	40.13	558	3081	-2523	ENR
BG	BBEA	2013	Soybeans	GroupA-0546	1.18	0.15	0.91	0.00	438.12	42.78	1438	3081	-1643	ENR
SP	BBEA	2013	Soybeans	GroupA-0548	1.92	0.01	1.71	0.00	36905.03	69.56	1994	3081	-1087	ENR
BS	BBEA	2013	Soybeans	GroupA-0549	1.23	0.01	1.00	0.00	7352.54	44.65	656	3081	-2425	ENR
PB	BBEA	2014	Soybeans	GroupA-0553	1.74	0.01	1.58	0.00	3203.03	96.11	334	3084	-2750	ENR
PTB	BBEA	2014	Soybeans	GroupA-0554	1.43	0.00	1.21	0.00	5911.78	78.83	299	3084	-2785	ENR
BG	BBEA	2014	Soybeans	GroupA-0557	0.78	0.01	0.64	0.00	438.12	42.79	1438	3084	-1646	ENR
BS	BBEA	2014	Soybeans	GroupA-0559	1.07	0.01	0.85	0.00	7352.54	59.23	656	3084	-2428	ENR
BG	BBEA	2015	Soybeans	GroupA-0568	0.52	0.22	0.42	0.00	438.12	69.69	1384	2811	-1427	ENR
AM	BBEA	2020	Soybeans	GroupA-0571	1.72	0.03	1.28	0.00	5233.55	50.99	991	3036	-2045	ENR
HB	BBEA	2020	Soybeans	GroupA-0572	1.38	0.00	1.13	0.00	4811.25	40.82	555	3036	-2481	ENR
PTB	BBEA	2020	Soybeans	GroupA-0574	2.01	0.00	1.81	0.00	5911.78	59.50	262	3036	-2774	ENR
BG	BBEA	2020	Soybeans	GroupA-0575	1.03	0.03	0.75	0.00	438.12	30.56	1436	3036	-1600	ENR
BS	BBEA	2020	Soybeans	GroupA-0576	2.17	0.03	1.81	0.00	7352.54	64.40	748	3036	-2288	ENR
RD	AA	2014	Soybeans	GroupA-0579	3.50	0.04	2.92	0.00	28035.93	89.36	1259	3968	-2709	ENR
2PB	AA	2019	Soybeans	GroupA-0581	3.07	0.01	2.92	0.00	14577.73	80.13	1767	3976	-2209	ENR
2PB	AA	2021	Soybeans	GroupA-0583	3.22	0.02	3.04	0.00	14577.73	69.75	1771	3966	-2195	ENR
SP	CS	2020	Soybeans	GroupA-0586	1.06	0.05	0.88	0.00	2392.70	22.16	1984	2437	-453	ENR
MP	CS	2020	Soybeans	GroupA-0587	1.72	0.04	1.43	0.00	10327.57	35.85	954	2437	-1483	ENR
RD	CS	2020	Soybeans	GroupA-0588	3.79	0.01	3.50	0.00	28340.32	78.95	1254	2437	-1183	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CF	JL	2019	Soybeans	GroupA-0590	1.51	0.00	1.38	0.00	30895.46	69.23	1095	888	207	ENR
PE	JL	2019	Soybeans	GroupA-0593	2.15	0.06	2.07	0.00	31805.51	98.90	942	888	54	ENR
PL	JL	2019	Soybeans	GroupA-0596	1.28	0.00	1.13	0.00	31562.14	58.68	968	888	80	ENR
PLB	JL	2019	Soybeans	GroupA-0597	1.02	0.00	0.82	0.00	31878.96	46.84	502	888	-386	ENR
6	JL	2021	Soybeans	GroupA-0598	2.43	0.01	2.08	0.00	31086.42	53.55	246	884	-638	ENR
AM	JL	2021	Soybeans	GroupA-0599	1.53	0.02	1.32	0.00	30699.89	33.73	1730	884	846	ENR
CF	JL	2021	Soybeans	GroupA-0600	1.29	0.00	1.03	0.00	30895.46	28.48	1090	884	206	ENR
HB	JL	2021	Soybeans	GroupA-0601	0.73	0.02	0.57	0.00	30527.42	16.04	363	884	-521	ENR
PE	JL	2021	Soybeans	GroupA-0604	2.46	0.05	2.31	0.00	31805.51	54.07	938	884	54	ENR
PW	JL	2021	Soybeans	GroupA-0605	1.13	0.02	0.91	0.00	31235.93	24.83	246	884	-638	ENR
PL	JL	2021	Soybeans	GroupA-0607	0.85	0.01	0.65	0.00	31562.14	18.62	978	884	94	ENR
PLB	JL	2021	Soybeans	GroupA-0608	4.18	0.01	3.56	0.00	31878.96	91.93	491	884	-393	ENR
BS	JL	2021	Soybeans	GroupA-0609	4.36	0.03	4.03	0.00	27818.58	95.94	85	884	-799	ENR
AA	SP	2014	Soybeans	GroupA-0612	1.06	0.00	0.83	0.01	3305.23	49.96	3968	1993	1975	ENR
CS	SP	2020	Soybeans	GroupA-0614	0.74	0.07	0.59	0.00	2392.70	17.09	2437	1984	453	ENR
MP	SP	2020	Soybeans	GroupA-0615	1.54	0.01	1.26	0.00	10398.84	35.49	954	1984	-1030	ENR
RD	SP	2020	Soybeans	GroupA-0616	4.24	0.04	4.05	0.00	30697.43	97.73	1254	1984	-730	ENR
AA	1P	2019	Soybeans	GroupA-0617	1.27	0.20	1.06	0.00	14966.67	36.42	3976	770	3206	ENR
2PB	1P	2019	Soybeans	GroupA-0618	0.70	0.41	0.53	0.00	884.63	20.01	1767	770	997	ENR
AA	1P	2021	Soybeans	GroupA-0619	0.78	0.00	0.53	0.00	14966.67	16.39	3966	770	3196	ENR
2PB	1P	2021	Soybeans	GroupA-0620	0.91	0.07	0.78	0.00	884.63	18.99	1771	770	1001	ENR
RD	1P	2021	Soybeans	GroupA-0621	3.35	0.04	2.35	0.00	28988.76	70.00	1259	770	489	ENR
AA	2PB	2019	Soybeans	GroupA-0622	1.10	0.07	0.86	0.00	14577.73	30.28	3976	1767	2209	ENR
1P	2PB	2019	Soybeans	GroupA-0623	0.96	0.10	0.77	0.00	884.63	26.34	770	1767	-997	ENR
AA	2PB	2021	Soybeans	GroupA-0624	1.04	0.00	0.81	0.00	14577.73	24.62	3966	1771	2195	ENR
1P	2PB	2021	Soybeans	GroupA-0625	1.16	0.00	0.94	0.00	884.63	27.47	770	1771	-1001	ENR
CS	MP	2020	Soybeans	GroupA-0627	0.88	0.21	0.66	0.00	10327.57	22.89	2437	954	1483	ENR
SP	MP	2020	Soybeans	GroupA-0628	1.29	0.41	1.12	0.00	10398.84	33.63	1984	954	1030	ENR
6	BS	2013	Soybeans	GroupA-0630	1.82	0.00	1.46	0.00	3688.53	57.28	249	656	-407	ENR
AM	BS	2013	Soybeans	GroupA-0631	0.82	0.02	0.64	0.00	4011.02	25.85	1748	656	1092	ENR
HB	BS	2013	Soybeans	GroupA-0632	1.47	0.01	1.26	0.00	3100.07	46.11	558	656	-98	ENR
PTB	BS	2013	Soybeans	GroupA-0634	2.55	0.00	2.09	0.00	2114.72	80.27	289	656	-367	ENR
BG	BS	2013	Soybeans	GroupA-0635	1.57	0.11	1.40	0.00	7029.70	49.28	1438	656	782	ENR
BBEA	BS	2013	Soybeans	GroupA-0636	1.19	0.04	1.04	0.00	7352.54	37.42	3081	656	2425	ENR
SP	BS	2013	Soybeans	GroupA-0638	2.39	0.01	2.27	0.00	29622.57	75.02	1994	656	1338	ENR
6	BS	2014	Soybeans	GroupA-0639	2.30	0.02	1.98	0.00	3688.53	95.61	250	656	-406	ENR
AM	BS	2014	Soybeans	GroupA-0640	1.89	0.00	1.55	0.00	4011.02	78.45	1748	656	1092	ENR
HB	BS	2014	Soybeans	GroupA-0641	2.14	0.04	1.59	0.00	3100.07	88.95	555	656	-101	ENR
PB	BS	2014	Soybeans	GroupA-0642	1.40	0.10	1.10	0.00	4411.96	58.35	334	656	-322	ENR
PTB	BS	2014	Soybeans	GroupA-0643	1.15	0.00	0.86	0.00	2114.72	47.82	299	656	-357	ENR
PL	BS	2014	Soybeans	GroupA-0644	1.68	0.00	1.38	0.00	3972.53	69.78	974	656	318	ENR
BG	BS	2014	Soybeans	GroupA-0646	1.33	0.00	1.16	0.00	7029.70	55.22	1438	656	782	ENR
BBEA	BS	2014	Soybeans	GroupA-0647	1.31	0.03	1.14	0.00	7352.54	54.60	3084	656	2428	ENR
AM	BS	2015	Soybeans	GroupA-0650	0.98	0.12	0.82	0.00	4011.02	71.16	1467	659	808	ENR
HB	BS	2015	Soybeans	GroupA-0652	1.21	0.01	1.01	0.00	3100.07	87.84	549	659	-110	ENR
PB	BS	2015	Soybeans	GroupA-0653	0.79	0.08	0.61	0.00	4411.96	57.34	327	659	-332	ENR
PTB	BS	2015	Soybeans	GroupA-0654	1.29	0.02	1.09	0.00	2114.72	93.97	303	659	-356	ENR
PL	BS	2015	Soybeans	GroupA-0655	1.29	0.00	1.08	0.00	3972.53	93.74	905	659	246	ENR
BG	BS	2015	Soybeans	GroupA-0657	0.85	0.00	0.71	0.00	7029.70	61.54	1384	659	725	ENR
BBEA	BS	2015	Soybeans	GroupA-0658	0.75	0.03	0.63	0.00	7352.54	54.17	2811	659	2152	ENR
CF	BS	2016	Soybeans	GroupA-0659	1.08	0.00	0.86	0.00	3076.95	43.00	1083	655	428	ENR
PTB	BS	2016	Soybeans	GroupA-0662	1.36	0.01	1.08	0.00	2114.72	53.98	297	655	-358	ENR
HB	BS	2018	Soybeans	GroupA-0663	1.18	0.00	0.90	0.00	3100.07	31.12	184	752	-568	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PE	BS	2018	Soybeans	GroupA-0665	1.21	0.00	0.88	0.00	4129.23	32.01	941	752	189	ENR
PW	BS	2018	Soybeans	GroupA-0666	1.19	0.00	0.92	0.00	3638.27	31.36	257	752	-495	ENR
PTB	BS	2018	Soybeans	GroupA-0667	1.53	0.01	1.17	0.00	2114.72	40.51	289	752	-463	ENR
6	BS	2020	Soybeans	GroupA-0668	2.94	0.00	2.25	0.00	3688.53	86.53	247	748	-501	ENR
AM	BS	2020	Soybeans	GroupA-0669	1.27	0.04	0.93	0.00	4011.02	37.26	991	748	243	ENR
HB	BS	2020	Soybeans	GroupA-0670	0.73	0.30	0.59	0.00	3100.07	21.57	555	748	-193	ENR
PTB	BS	2020	Soybeans	GroupA-0672	2.09	0.00	1.92	0.00	2114.72	61.43	262	748	-486	ENR
BG	BS	2020	Soybeans	GroupA-0673	1.00	0.00	0.74	0.00	7029.70	29.50	1436	748	688	ENR
BBEA	BS	2020	Soybeans	GroupA-0674	0.95	0.00	0.79	0.00	7352.54	27.91	3036	748	2288	ENR
AA	RD	2014	Soybeans	GroupA-0688	2.43	0.00	1.56	0.00	28035.93	53.30	3968	1259	2709	ENR
CS	RD	2020	Soybeans	GroupA-0689	1.48	0.08	1.26	0.00	28340.32	40.70	2437	1254	1183	ENR
SP	RD	2020	Soybeans	GroupA-0690	1.18	0.07	0.96	0.00	30697.43	32.42	1984	1254	730	ENR
MP	RD	2020	Soybeans	GroupA-0691	1.73	0.03	1.49	0.00	29241.14	47.55	954	1254	-300	ENR
AA	RD	2021	Soybeans	GroupA-0692	1.30	0.13	0.97	0.00	28035.93	34.07	3966	1259	2707	ENR
AM	6	2016	Corn	GroupA-0695	1.13	0.03	0.89	0.00	1216.49	12.58	1759	249	1510	ENR
HB	6	2016	Corn	GroupA-0696	1.30	0.01	0.98	0.00	593.20	14.47	366	249	117	ENR
NH	6	2016	Corn	GroupA-0697	1.96	0.05	1.59	0.00	2271.12	21.70	222	249	-27	ENR
PL	6	2016	Corn	GroupA-0698	1.13	0.02	0.89	0.00	632.74	12.50	978	249	729	ENR
PLB	6	2016	Corn	GroupA-0699	1.29	0.00	1.04	0.00	1403.96	14.30	501	249	252	ENR
BG	6	2016	Corn	GroupA-0700	1.25	0.00	1.04	0.00	3938.74	13.84	1426	249	1177	ENR
BBEA	6	2016	Corn	GroupA-0701	1.08	0.11	0.83	0.00	4348.89	11.94	3066	249	2817	ENR
AM	6	2017	Corn	GroupA-0702	2.36	0.01	2.01	0.00	1216.49	19.52	1746	248	1498	ENR
CF	6	2017	Corn	GroupA-0703	3.16	0.14	2.67	0.00	1790.97	26.18	1099	248	851	ENR
HB	6	2017	Corn	GroupA-0704	4.51	0.01	3.94	0.00	593.20	37.32	557	248	309	ENR
NH	6	2017	Corn	GroupA-0705	6.24	0.01	5.16	0.00	2271.12	51.60	226	248	-22	ENR
PB	6	2017	Corn	GroupA-0706	4.57	0.01	3.79	0.00	2775.62	37.80	338	248	90	ENR
PTB	6	2017	Corn	GroupA-0707	6.24	0.00	5.24	0.00	1728.12	51.62	296	248	48	ENR
PL	6	2017	Corn	GroupA-0708	2.64	0.15	2.24	0.00	632.74	21.85	979	248	731	ENR
PLB	6	2017	Corn	GroupA-0709	2.72	0.00	2.25	0.00	1403.96	22.51	508	248	260	ENR
BG	6	2017	Corn	GroupA-0710	3.15	0.08	2.67	0.00	3938.74	26.10	1426	248	1178	ENR
BBEA	6	2017	Corn	GroupA-0711	2.91	0.01	2.46	0.00	4348.89	24.07	2889	248	2641	ENR
JL	6	2017	Corn	GroupA-0712	11.27	0.00	10.48	0.00	31086.42	93.24	862	248	614	ENR
BS	6	2017	Corn	GroupA-0713	3.90	0.06	3.34	0.01	3688.53	32.27	757	248	509	ENR
AM	6	2018	Corn	GroupA-0714	2.48	0.00	2.03	0.00	1216.49	31.49	1727	244	1483	ENR
CF	6	2018	Corn	GroupA-0715	2.93	0.03	2.24	0.00	1790.97	37.20	1098	244	854	ENR
HB	6	2018	Corn	GroupA-0716	5.33	0.03	4.70	0.00	593.20	67.64	363	244	119	ENR
NH	6	2018	Corn	GroupA-0717	2.22	0.21	1.74	0.00	2271.12	28.13	222	244	-22	ENR
PL	6	2018	Corn	GroupA-0718	2.64	0.00	2.07	0.00	632.74	33.51	974	244	730	ENR
PLB	6	2018	Corn	GroupA-0719	2.39	0.01	1.95	0.00	1403.96	30.36	506	244	262	ENR
BG	6	2018	Corn	GroupA-0720	2.56	0.01	1.99	0.00	3938.74	32.52	1421	244	1177	ENR
BBEA	6	2018	Corn	GroupA-0721	2.37	0.00	2.01	0.00	4348.89	30.11	3047	244	2803	ENR
AM	6	2019	Corn	GroupA-0723	0.98	0.27	0.76	0.01	1216.49	14.76	992	246	746	ENR
HB	6	2019	Corn	GroupA-0724	2.71	0.05	2.19	0.00	593.20	41.05	365	246	119	ENR
NH	6	2019	Corn	GroupA-0725	5.41	0.00	4.24	0.00	2271.12	81.82	215	246	-31	ENR
BG	6	2019	Corn	GroupA-0726	1.90	0.00	1.61	0.00	3938.74	28.79	1428	246	1182	ENR
BBEA	6	2019	Corn	GroupA-0727	1.73	0.06	1.44	0.00	4348.89	26.23	3067	246	2821	ENR
BS	6	2019	Corn	GroupA-0728	5.47	0.00	4.92	0.01	3688.53	82.66	749	246	503	ENR
NH	AM	2015	Corn	GroupA-0729	1.51	0.01	1.17	0.00	1283.59	21.08	221	276	-55	ENR
PL	AM	2015	Corn	GroupA-0730	4.71	0.14	4.28	0.00	1797.09	65.91	55	276	-221	ENR
6	AM	2016	Corn	GroupA-0731	3.10	0.00	1.79	0.00	1216.49	35.02	249	1759	-1510	ENR
HB	AM	2016	Corn	GroupA-0732	5.07	0.01	1.76	0.00	1351.32	57.34	366	1759	-1393	ENR
NH	AM	2016	Corn	GroupA-0733	2.08	0.00	1.57	0.00	1283.59	23.57	222	1759	-1537	ENR
PL	AM	2016	Corn	GroupA-0734	1.04	0.01	0.80	0.00	1797.09	11.81	978	1759	-781	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PLB	AM	2016	Corn	GroupA-0735	1.89	0.01	1.58	0.00	2601.80	21.38	501	1759	-1258	ENR
BG	AM	2016	Corn	GroupA-0736	1.32	0.01	0.92	0.00	4801.99	14.94	1426	1759	-333	ENR
BBEA	AM	2016	Corn	GroupA-0737	1.33	0.00	0.94	0.00	5233.55	15.06	3066	1759	1307	ENR
6	AM	2017	Corn	GroupA-0738	4.06	0.00	3.29	0.00	1216.49	33.70	248	1746	-1498	ENR
CF	AM	2017	Corn	GroupA-0739	2.78	0.02	2.22	0.00	2925.31	23.11	1099	1746	-647	ENR
HB	AM	2017	Corn	GroupA-0740	3.42	0.00	2.81	0.00	1351.32	28.38	557	1746	-1189	ENR
NH	AM	2017	Corn	GroupA-0741	6.55	0.03	5.19	0.00	1283.59	54.38	226	1746	-1520	ENR
PB	AM	2017	Corn	GroupA-0742	6.97	0.00	5.92	0.00	3991.90	57.85	338	1746	-1408	ENR
PTB	AM	2017	Corn	GroupA-0743	6.70	0.04	5.82	0.00	1901.85	55.63	296	1746	-1450	ENR
PL	AM	2017	Corn	GroupA-0744	4.01	0.03	3.43	0.00	1797.09	33.29	979	1746	-767	ENR
PLB	AM	2017	Corn	GroupA-0745	5.11	0.00	4.42	0.00	2601.80	42.43	508	1746	-1238	ENR
BG	AM	2017	Corn	GroupA-0746	2.55	0.00	2.15	0.00	4801.99	21.15	1426	1746	-320	ENR
BBEA	AM	2017	Corn	GroupA-0747	2.77	0.03	2.40	0.00	5233.55	23.04	2889	1746	1143	ENR
JL	AM	2017	Corn	GroupA-0748	9.83	0.04	9.25	0.00	30699.89	81.61	862	1746	-884	ENR
BS	AM	2017	Corn	GroupA-0749	3.52	0.00	2.97	0.00	4011.02	29.23	757	1746	-989	ENR
6	AM	2018	Corn	GroupA-0750	4.80	0.00	3.72	0.00	1216.49	60.43	244	1727	-1483	ENR
CF	AM	2018	Corn	GroupA-0751	2.83	0.00	2.14	0.00	2925.31	35.67	1098	1727	-629	ENR
HB	AM	2018	Corn	GroupA-0752	3.99	0.03	3.26	0.00	1351.32	50.26	363	1727	-1364	ENR
NH	AM	2018	Corn	GroupA-0753	2.85	0.00	2.28	0.00	1283.59	35.91	222	1727	-1505	ENR
PL	AM	2018	Corn	GroupA-0754	2.78	0.02	2.24	0.00	1797.09	35.05	974	1727	-753	ENR
PLB	AM	2018	Corn	GroupA-0755	3.00	0.03	2.44	0.00	2601.80	37.73	506	1727	-1221	ENR
BG	AM	2018	Corn	GroupA-0756	2.50	0.05	1.92	0.00	4801.99	31.52	1421	1727	-306	ENR
BBEA	AM	2018	Corn	GroupA-0757	2.23	0.00	1.82	0.00	5233.55	28.02	3047	1727	1320	ENR
6	AM	2019	Corn	GroupA-0759	1.65	0.09	1.32	0.00	1216.49	25.95	246	992	-746	ENR
HB	AM	2019	Corn	GroupA-0760	3.15	0.00	2.45	0.00	1351.32	49.63	365	992	-627	ENR
BG	AM	2019	Corn	GroupA-0762	2.84	0.00	2.56	0.00	4801.99	44.81	1428	992	436	ENR
BBEA	AM	2019	Corn	GroupA-0763	1.61	0.10	1.33	0.00	5233.55	25.39	3067	992	2075	ENR
CF	AM	2020	Corn	GroupA-0765	2.41	0.03	2.10	0.00	2925.31	31.09	1095	742	353	ENR
PB	AM	2020	Corn	GroupA-0766	2.91	0.04	2.50	0.00	3991.90	37.62	333	742	-409	ENR
PE	AM	2020	Corn	GroupA-0767	5.58	0.06	5.18	0.00	4256.93	72.11	942	742	200	ENR
PW	AM	2020	Corn	GroupA-0768	4.15	0.01	3.65	0.00	4299.79	53.62	260	742	-482	ENR
PL	AM	2020	Corn	GroupA-0769	2.27	0.00	1.86	0.00	1797.09	29.29	976	742	234	ENR
PLB	AM	2020	Corn	GroupA-0770	3.10	0.02	2.64	0.00	2601.80	40.00	498	742	-244	ENR
JL	AM	2020	Corn	GroupA-0771	2.16	0.00	1.72	0.00	30699.89	27.94	889	742	147	ENR
PL	CF	2013	Corn	GroupA-0773	1.64	0.01	1.33	0.00	1531.30	18.38	972	1093	-121	ENR
PLB	CF	2013	Corn	GroupA-0774	3.11	0.01	2.72	0.00	1177.89	34.92	503	1093	-590	ENR
NH	CF	2014	Corn	GroupA-0775	2.89	0.01	2.36	0.00	4061.52	23.93	223	1086	-863	ENR
6	CF	2017	Corn	GroupA-0776	4.21	0.05	3.33	0.00	1790.97	38.44	248	1099	-851	ENR
AM	CF	2017	Corn	GroupA-0777	2.13	0.01	1.58	0.00	2925.31	19.46	1746	1099	647	ENR
HB	CF	2017	Corn	GroupA-0778	3.07	0.01	2.61	0.00	1609.48	28.09	557	1099	-542	ENR
NH	CF	2017	Corn	GroupA-0779	7.04	0.00	5.22	0.00	4061.52	64.35	226	1099	-873	ENR
PB	CF	2017	Corn	GroupA-0780	5.15	0.02	3.90	0.00	1477.63	47.09	338	1099	-761	ENR
PTB	CF	2017	Corn	GroupA-0781	5.46	0.00	4.83	0.00	2125.67	49.87	296	1099	-803	ENR
PL	CF	2017	Corn	GroupA-0782	1.97	0.01	1.49	0.00	1531.30	17.99	979	1099	-120	ENR
PLB	CF	2017	Corn	GroupA-0783	2.94	0.01	2.24	0.00	1177.89	26.83	508	1099	-591	ENR
BG	CF	2017	Corn	GroupA-0784	2.14	0.00	1.60	0.00	3976.07	19.56	1426	1099	327	ENR
BBEA	CF	2017	Corn	GroupA-0785	2.16	0.02	1.63	0.00	4282.54	19.75	2889	1099	1790	ENR
JL	CF	2017	Corn	GroupA-0786	10.85	0.07	9.32	0.00	30895.46	99.17	862	1099	-237	ENR
BS	CF	2017	Corn	GroupA-0787	4.95	0.01	4.52	0.00	3076.95	45.26	757	1099	-342	ENR
6	CF	2018	Corn	GroupA-0788	4.84	0.01	3.64	0.00	1790.97	65.08	244	1098	-854	ENR
AM	CF	2018	Corn	GroupA-0789	2.50	0.01	1.96	0.00	2925.31	33.64	1727	1098	629	ENR
HB	CF	2018	Corn	GroupA-0790	5.58	0.00	4.72	0.00	1609.48	74.98	363	1098	-735	ENR
NH	CF	2018	Corn	GroupA-0791	3.86	0.03	3.06	0.00	4061.52	51.85	222	1098	-876	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PL	CF	2018	Corn	GroupA-0792	2.56	0.00	1.96	0.00	1531.30	34.41	974	1098	-124	ENR
PLB	CF	2018	Corn	GroupA-0793	2.66	0.05	2.14	0.00	1177.89	35.68	506	1098	-592	ENR
BG	CF	2018	Corn	GroupA-0794	2.24	0.00	1.76	0.00	3976.07	30.08	1421	1098	323	ENR
BBEA	CF	2018	Corn	GroupA-0795	2.27	0.00	1.77	0.01	4282.54	30.50	3047	1098	1949	ENR
JL	CF	2018	Corn	GroupA-0796	7.32	0.02	6.55	0.00	30895.46	98.42	901	1098	-197	ENR
AM	CF	2020	Corn	GroupA-0797	2.14	0.00	1.73	0.00	2925.31	25.50	742	1095	-353	ENR
PB	CF	2020	Corn	GroupA-0798	2.54	0.14	2.08	0.00	1477.63	30.28	333	1095	-762	ENR
PE	CF	2020	Corn	GroupA-0799	3.53	0.02	3.04	0.00	1470.34	41.97	942	1095	-153	ENR
PW	CF	2020	Corn	GroupA-0800	3.69	0.01	3.27	0.00	1380.51	43.87	260	1095	-835	ENR
PL	CF	2020	Corn	GroupA-0801	2.08	0.07	1.71	0.00	1531.30	24.76	976	1095	-119	ENR
PLB	CF	2020	Corn	GroupA-0802	2.38	0.00	1.81	0.00	1177.89	28.32	498	1095	-597	ENR
JL	CF	2020	Corn	GroupA-0803	3.42	0.01	2.85	0.00	30895.46	40.69	889	1095	-206	ENR
6	HB	2016	Corn	GroupA-0804	1.39	0.08	1.04	0.00	593.20	15.14	249	366	-117	ENR
AM	HB	2016	Corn	GroupA-0805	1.01	0.00	0.84	0.00	1351.32	11.02	1759	366	1393	ENR
NH	HB	2016	Corn	GroupA-0806	1.59	0.03	1.30	0.00	2580.18	17.40	222	366	-144	ENR
PL	HB	2016	Corn	GroupA-0807	0.90	0.02	0.71	0.00	1056.49	9.84	978	366	612	ENR
PLB	HB	2016	Corn	GroupA-0808	1.18	0.01	0.93	0.00	1650.52	12.93	501	366	135	ENR
BG	HB	2016	Corn	GroupA-0809	1.16	0.01	0.97	0.00	4415.29	12.72	1426	366	1060	ENR
BBEA	HB	2016	Corn	GroupA-0810	1.13	0.00	0.93	0.00	4811.25	12.33	3066	366	2700	ENR
6	HB	2017	Corn	GroupA-0811	6.53	0.12	4.82	0.00	593.20	69.23	248	557	-309	ENR
AM	HB	2017	Corn	GroupA-0812	3.44	0.06	2.70	0.00	1351.32	36.52	1746	557	1189	ENR
CF	HB	2017	Corn	GroupA-0813	3.59	0.19	2.75	0.00	1609.48	38.09	1099	557	542	ENR
NH	HB	2017	Corn	GroupA-0814	7.06	0.00	6.07	0.00	2580.18	74.85	226	557	-331	ENR
PB	HB	2017	Corn	GroupA-0815	6.19	0.27	5.37	0.00	2853.21	65.67	338	557	-219	ENR
PTB	HB	2017	Corn	GroupA-0816	4.53	0.00	3.65	0.00	1152.69	48.07	296	557	-261	ENR
PL	HB	2017	Corn	GroupA-0817	3.77	0.18	3.04	0.00	1056.49	39.99	979	557	422	ENR
PLB	HB	2017	Corn	GroupA-0818	4.81	0.09	3.78	0.00	1650.52	50.96	508	557	-49	ENR
BG	HB	2017	Corn	GroupA-0819	3.39	0.05	2.62	0.00	4415.29	35.95	1426	557	869	ENR
BBEA	HB	2017	Corn	GroupA-0820	3.78	0.02	2.87	0.00	4811.25	40.05	2889	557	2332	ENR
JL	HB	2017	Corn	GroupA-0821	9.40	0.02	8.55	0.00	30527.42	99.66	862	557	305	ENR
BS	HB	2017	Corn	GroupA-0822	3.86	0.06	3.24	0.00	3100.07	40.95	757	557	200	ENR
6	HB	2018	Corn	GroupA-0823	4.74	0.03	4.05	0.00	593.20	83.28	244	363	-119	ENR
AM	HB	2018	Corn	GroupA-0824	3.05	0.00	2.62	0.00	1351.32	53.56	1727	363	1364	ENR
CF	HB	2018	Corn	GroupA-0825	4.51	0.00	3.85	0.00	1609.48	79.27	1098	363	735	ENR
NH	HB	2018	Corn	GroupA-0826	4.77	0.00	4.19	0.00	2580.18	83.79	222	363	-141	ENR
PL	HB	2018	Corn	GroupA-0827	4.00	0.24	3.46	0.00	1056.49	70.39	974	363	611	ENR
PLB	HB	2018	Corn	GroupA-0828	4.57	0.01	3.90	0.00	1650.52	80.32	506	363	143	ENR
BG	HB	2018	Corn	GroupA-0829	3.97	0.19	3.43	0.00	4415.29	69.89	1421	363	1058	ENR
BBEA	HB	2018	Corn	GroupA-0830	3.28	0.10	2.81	0.00	4811.25	57.60	3047	363	2684	ENR
6	HB	2019	Corn	GroupA-0832	3.15	0.16	2.51	0.00	593.20	51.53	246	365	-119	ENR
AM	HB	2019	Corn	GroupA-0833	2.11	0.09	1.66	0.01	1351.32	34.47	992	365	627	ENR
NH	HB	2019	Corn	GroupA-0834	4.66	0.00	3.68	0.00	2580.18	76.27	215	365	-150	ENR
BG	HB	2019	Corn	GroupA-0835	2.93	0.01	2.41	0.00	4415.29	48.01	1428	365	1063	ENR
BBEA	HB	2019	Corn	GroupA-0836	2.64	0.00	2.09	0.00	4811.25	43.29	3067	365	2702	ENR
CF	NH	2014	Corn	GroupA-0838	1.96	0.03	1.56	0.00	4061.52	18.87	1086	223	863	ENR
AM	NH	2015	Corn	GroupA-0839	1.92	0.07	1.48	0.00	1283.59	27.48	276	221	55	ENR
PL	NH	2015	Corn	GroupA-0840	1.23	0.06	0.92	0.00	2690.61	17.54	55	221	-166	ENR
6	NH	2016	Corn	GroupA-0841	1.74	0.15	1.42	0.00	2271.12	22.67	249	222	27	ENR
AM	NH	2016	Corn	GroupA-0842	1.28	0.01	1.05	0.00	1283.59	16.66	1759	222	1537	ENR
HB	NH	2016	Corn	GroupA-0843	2.08	0.10	1.93	0.00	2580.18	27.14	366	222	144	ENR
PL	NH	2016	Corn	GroupA-0844	1.05	0.00	0.86	0.00	2690.61	13.72	978	222	756	ENR
PLB	NH	2016	Corn	GroupA-0845	1.70	0.12	1.47	0.00	3474.91	22.17	501	222	279	ENR
BG	NH	2016	Corn	GroupA-0846	1.81	0.17	1.64	0.00	4995.12	23.63	1426	222	1204	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BBEA	NH	2016	Corn	GroupA-0847	1.26	0.01	1.04	0.00	5431.98	16.45	3066	222	2844	ENR
6	NH	2017	Corn	GroupA-0848	4.98	0.00	4.04	0.00	2271.12	48.19	248	226	22	ENR
AM	NH	2017	Corn	GroupA-0849	3.43	0.00	2.78	0.00	1283.59	33.13	1746	226	1520	ENR
CF	NH	2017	Corn	GroupA-0850	4.07	0.10	3.22	0.00	4061.52	39.39	1099	226	873	ENR
HB	NH	2017	Corn	GroupA-0851	3.33	0.14	2.72	0.00	2580.18	32.17	557	226	331	ENR
PB	NH	2017	Corn	GroupA-0852	4.85	0.00	4.14	0.00	4911.94	46.86	338	226	112	ENR
PTB	NH	2017	Corn	GroupA-0853	8.24	0.00	7.80	0.00	3164.44	79.67	296	226	70	ENR
PL	NH	2017	Corn	GroupA-0854	2.38	0.01	2.01	0.00	2690.61	23.02	979	226	753	ENR
PLB	NH	2017	Corn	GroupA-0855	3.85	0.00	3.24	0.00	3474.91	37.25	508	226	282	ENR
BG	NH	2017	Corn	GroupA-0856	2.19	0.01	1.84	0.00	4995.12	21.21	1426	226	1200	ENR
BBEA	NH	2017	Corn	GroupA-0857	1.93	0.03	1.47	0.00	5431.98	18.64	2889	226	2663	ENR
JL	NH	2017	Corn	GroupA-0858	4.56	0.17	4.07	0.00	31398.77	44.07	862	226	636	ENR
BS	NH	2017	Corn	GroupA-0859	2.62	0.05	2.23	0.00	5253.94	25.34	757	226	531	ENR
6	NH	2018	Corn	GroupA-0860	4.67	0.01	3.60	0.00	2271.12	74.38	244	222	22	ENR
AM	NH	2018	Corn	GroupA-0861	3.63	0.03	3.13	0.00	1283.59	57.93	1727	222	1505	ENR
CF	NH	2018	Corn	GroupA-0862	2.95	0.01	2.24	0.00	4061.52	47.08	1098	222	876	ENR
HB	NH	2018	Corn	GroupA-0863	3.29	0.04	2.58	0.00	2580.18	52.48	363	222	141	ENR
PL	NH	2018	Corn	GroupA-0864	3.21	0.13	2.66	0.00	2690.61	51.19	974	222	752	ENR
PLB	NH	2018	Corn	GroupA-0865	3.23	0.02	2.86	0.00	3474.91	51.51	506	222	284	ENR
BG	NH	2018	Corn	GroupA-0866	4.03	0.00	3.45	0.00	4995.12	64.26	1421	222	1199	ENR
BBEA	NH	2018	Corn	GroupA-0867	2.41	0.00	1.73	0.00	5431.98	38.45	3047	222	2825	ENR
JL	NH	2018	Corn	GroupA-0868	4.26	0.07	3.76	0.00	31398.77	67.93	901	222	679	ENR
6	NH	2019	Corn	GroupA-0869	2.66	0.00	1.93	0.00	2271.12	35.40	246	215	31	ENR
AM	NH	2019	Corn	GroupA-0870	2.28	0.03	2.02	0.01	1283.59	30.34	992	215	777	ENR
HB	NH	2019	Corn	GroupA-0871	3.72	0.29	3.35	0.00	2580.18	49.55	365	215	150	ENR
BG	NH	2019	Corn	GroupA-0872	2.54	0.02	1.89	0.00	4995.12	33.81	1428	215	1213	ENR
BBEA	NH	2019	Corn	GroupA-0873	1.73	0.05	1.34	0.00	5431.98	23.01	3067	215	2852	ENR
BS	NH	2019	Corn	GroupA-0874	6.72	0.29	6.19	0.00	5253.94	89.54	749	215	534	ENR
CF	PB	2013	Corn	GroupA-0875	3.11	0.08	2.44	0.00	1477.63	28.30	1093	327	766	ENR
PL	PB	2013	Corn	GroupA-0876	1.91	0.25	1.56	0.00	2233.71	17.37	972	327	645	ENR
PLB	PB	2013	Corn	GroupA-0877	2.46	0.02	1.93	0.00	1437.03	22.35	503	327	176	ENR
6	PB	2017	Corn	GroupA-0878	5.19	0.01	3.31	0.00	2775.62	39.76	248	338	-90	ENR
AM	PB	2017	Corn	GroupA-0879	3.35	0.00	2.39	0.00	3991.90	25.65	1746	338	1408	ENR
CF	PB	2017	Corn	GroupA-0880	2.32	0.02	1.82	0.00	1477.63	17.79	1099	338	761	ENR
HB	PB	2017	Corn	GroupA-0881	2.77	0.02	2.19	0.00	2853.21	21.22	557	338	219	ENR
PL	PB	2017	Corn	GroupA-0884	3.23	0.02	2.85	0.00	2233.71	24.71	979	338	641	ENR
PLB	PB	2017	Corn	GroupA-0885	3.87	0.07	3.28	0.00	1437.03	29.65	508	338	170	ENR
BG	PB	2017	Corn	GroupA-0886	6.52	0.01	6.06	0.00	3001.92	49.98	1426	338	1088	ENR
BBEA	PB	2017	Corn	GroupA-0887	5.80	0.00	5.38	0.00	3203.03	44.41	2889	338	2551	ENR
BS	PB	2017	Corn	GroupA-0889	9.83	0.02	9.16	0.00	4411.96	75.36	757	338	419	ENR
AM	PB	2020	Corn	GroupA-0890	3.28	0.00	2.78	0.00	3991.90	29.95	742	333	409	ENR
CF	PB	2020	Corn	GroupA-0891	2.44	0.09	2.09	0.00	1477.63	22.27	1095	333	762	ENR
PE	PB	2020	Corn	GroupA-0892	2.03	0.00	1.58	0.00	573.60	18.58	942	333	609	ENR
PW	PB	2020	Corn	GroupA-0893	4.91	0.03	4.46	0.00	1133.42	44.84	260	333	-73	ENR
PL	PB	2020	Corn	GroupA-0894	2.12	0.00	1.65	0.00	2233.71	19.38	976	333	643	ENR
PLB	PB	2020	Corn	GroupA-0895	3.11	0.00	2.71	0.00	1437.03	28.42	498	333	165	ENR
JL	PB	2020	Corn	GroupA-0896	5.80	0.02	5.36	0.00	32178.80	52.97	889	333	556	ENR
AM	PE	2020	Corn	GroupA-0897	2.90	0.00	2.41	0.00	4256.93	24.92	742	942	-200	ENR
CF	PE	2020	Corn	GroupA-0898	4.16	0.02	3.72	0.00	1470.34	35.71	1095	942	153	ENR
PB	PE	2020	Corn	GroupA-0899	4.11	0.00	3.34	0.00	573.60	35.27	333	942	-609	ENR
PW	PE	2020	Corn	GroupA-0900	6.67	0.01	4.31	0.00	602.45	57.26	260	942	-682	ENR
PL	PE	2020	Corn	GroupA-0901	1.78	0.07	1.42	0.00	2576.96	15.28	976	942	34	ENR
PLB	PE	2020	Corn	GroupA-0902	3.07	0.00	2.66	0.00	1832.05	26.33	498	942	-444	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
JL	PE	2020	Corn	GroupA-0903	5.44	0.07	5.06	0.00	31805.51	46.69	889	942	-53	ENR
AM	PW	2020	Corn	GroupA-0904	2.16	0.01	1.78	0.00	4299.79	20.82	742	260	482	ENR
CF	PW	2020	Corn	GroupA-0905	2.26	0.00	1.90	0.00	1380.51	21.77	1095	260	835	ENR
PB	PW	2020	Corn	GroupA-0906	5.60	0.05	5.26	0.00	1133.42	53.96	333	260	73	ENR
PE	PW	2020	Corn	GroupA-0907	1.88	0.00	1.51	0.00	602.45	18.17	942	260	682	ENR
PL	PW	2020	Corn	GroupA-0908	1.85	0.00	1.53	0.00	2757.07	17.81	976	260	716	ENR
PLB	PW	2020	Corn	GroupA-0909	2.84	0.02	2.37	0.00	2110.84	27.38	498	260	238	ENR
JL	PW	2020	Corn	GroupA-0910	6.87	0.01	6.57	0.00	31235.93	66.23	889	260	629	ENR
AM	PTB	2017	Corn	GroupA-0912	5.62	0.03	5.14	0.00	1901.85	94.56	1746	296	1450	ENR
CF	PTB	2017	Corn	GroupA-0913	5.37	0.31	4.33	0.00	2125.67	90.25	1099	296	803	ENR
HB	PTB	2017	Corn	GroupA-0914	5.65	0.03	4.91	0.00	1152.69	95.02	557	296	261	ENR
PL	PTB	2017	Corn	GroupA-0917	5.32	0.00	4.74	0.00	2192.01	89.38	979	296	683	ENR
BG	PTB	2017	Corn	GroupA-0919	4.12	0.10	3.56	0.00	5528.32	69.22	1426	296	1130	ENR
BBEA	PTB	2017	Corn	GroupA-0920	4.72	0.32	4.35	0.00	5911.78	79.36	2889	296	2593	ENR
BS	PTB	2017	Corn	GroupA-0922	2.04	0.17	1.54	0.00	2114.72	34.34	757	296	461	ENR
CF	PL	2013	Corn	GroupA-0923	2.52	0.01	2.18	0.00	1531.30	24.85	1093	972	121	ENR
PLB	PL	2013	Corn	GroupA-0925	1.41	0.00	1.08	0.00	809.82	13.91	503	972	-469	ENR
AM	PL	2015	Corn	GroupA-0926	1.73	0.03	1.49	0.00	1797.09	21.68	276	55	221	ENR
NH	PL	2015	Corn	GroupA-0927	1.35	0.02	1.12	0.00	2690.61	16.92	221	55	166	ENR
6	PL	2016	Corn	GroupA-0928	2.81	0.00	1.98	0.00	632.74	31.99	249	978	-729	ENR
AM	PL	2016	Corn	GroupA-0929	0.99	0.03	0.76	0.00	1797.09	11.20	1759	978	781	ENR
HB	PL	2016	Corn	GroupA-0930	2.06	0.00	1.12	0.00	1056.49	23.47	366	978	-612	ENR
NH	PL	2016	Corn	GroupA-0931	3.00	0.00	2.45	0.00	2690.61	34.16	222	978	-756	ENR
PLB	PL	2016	Corn	GroupA-0932	1.17	0.00	0.93	0.00	809.82	13.29	501	978	-477	ENR
BG	PL	2016	Corn	GroupA-0933	1.39	0.02	1.05	0.00	3360.23	15.82	1426	978	448	ENR
BBEA	PL	2016	Corn	GroupA-0934	1.33	0.01	1.04	0.00	3759.77	15.11	3066	978	2088	ENR
6	PL	2017	Corn	GroupA-0935	4.93	0.00	3.86	0.00	632.74	47.42	248	979	-731	ENR
AM	PL	2017	Corn	GroupA-0936	3.35	0.04	2.28	0.00	1797.09	32.17	1746	979	767	ENR
CF	PL	2017	Corn	GroupA-0937	3.02	0.01	2.34	0.00	1531.30	29.08	1099	979	120	ENR
HB	PL	2017	Corn	GroupA-0938	3.77	0.00	2.89	0.00	1056.49	36.28	557	979	-422	ENR
NH	PL	2017	Corn	GroupA-0939	5.50	0.01	4.13	0.00	2690.61	52.87	226	979	-753	ENR
PB	PL	2017	Corn	GroupA-0940	2.95	0.04	2.42	0.00	2233.71	28.41	338	979	-641	ENR
PTB	PL	2017	Corn	GroupA-0941	6.80	0.01	6.22	0.00	2192.01	65.37	296	979	-683	ENR
PLB	PL	2017	Corn	GroupA-0942	2.48	0.00	1.92	0.00	809.82	23.85	508	979	-471	ENR
BG	PL	2017	Corn	GroupA-0943	2.45	0.06	1.83	0.00	3360.23	23.58	1426	979	447	ENR
BBEA	PL	2017	Corn	GroupA-0944	2.18	0.00	1.65	0.00	3759.77	20.94	2889	979	1910	ENR
JL	PL	2017	Corn	GroupA-0945	9.19	0.06	7.51	0.00	31562.14	88.42	862	979	-117	ENR
BS	PL	2017	Corn	GroupA-0946	3.53	0.02	2.79	0.00	3972.53	33.95	757	979	-222	ENR
6	PL	2018	Corn	GroupA-0947	5.41	0.01	4.01	0.00	632.74	79.42	244	974	-730	ENR
AM	PL	2018	Corn	GroupA-0948	3.42	0.00	2.45	0.00	1797.09	50.23	1727	974	753	ENR
CF	PL	2018	Corn	GroupA-0949	3.05	0.02	2.41	0.00	1531.30	44.73	1098	974	124	ENR
HB	PL	2018	Corn	GroupA-0950	4.46	0.00	3.47	0.00	1056.49	65.52	363	974	-611	ENR
NH	PL	2018	Corn	GroupA-0951	3.87	0.00	2.99	0.00	2690.61	56.81	222	974	-752	ENR
PLB	PL	2018	Corn	GroupA-0952	2.73	0.01	2.12	0.00	809.82	40.10	506	974	-468	ENR
BG	PL	2018	Corn	GroupA-0953	2.60	0.02	2.00	0.00	3360.23	38.11	1421	974	447	ENR
BBEA	PL	2018	Corn	GroupA-0954	2.28	0.02	1.88	0.01	3759.77	33.46	3047	974	2073	ENR
AM	PL	2020	Corn	GroupA-0956	1.99	0.05	1.58	0.00	1797.09	21.70	742	976	-234	ENR
CF	PL	2020	Corn	GroupA-0957	1.94	0.11	1.56	0.00	1531.30	21.14	1095	976	119	ENR
PB	PL	2020	Corn	GroupA-0958	3.08	0.05	2.40	0.00	2233.71	33.58	333	976	-643	ENR
PE	PL	2020	Corn	GroupA-0959	3.63	0.03	3.24	0.00	2576.96	39.58	942	976	-34	ENR
PW	PL	2020	Corn	GroupA-0960	2.98	0.00	2.39	0.00	2757.07	32.48	260	976	-716	ENR
PLB	PL	2020	Corn	GroupA-0961	2.46	0.15	2.03	0.00	809.82	26.81	498	976	-478	ENR
JL	PL	2020	Corn	GroupA-0962	3.50	0.07	2.80	0.00	31562.14	38.08	889	976	-87	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CF	PLB	2013	Corn	GroupA-0963	1.88	0.00	1.57	0.00	1177.89	19.06	1093	503	590	ENR
PL	PLB	2013	Corn	GroupA-0965	1.52	0.00	1.14	0.00	809.82	15.42	972	503	469	ENR
6	PLB	2016	Corn	GroupA-0966	3.08	0.03	2.36	0.00	1403.96	37.04	249	501	-252	ENR
AM	PLB	2016	Corn	GroupA-0967	1.06	0.09	0.86	0.00	2601.80	12.80	1759	501	1258	ENR
HB	PLB	2016	Corn	GroupA-0968	2.04	0.01	1.22	0.00	1650.52	24.60	366	501	-135	ENR
NH	PLB	2016	Corn	GroupA-0969	3.11	0.00	2.66	0.00	3474.91	37.48	222	501	-279	ENR
PL	PLB	2016	Corn	GroupA-0970	1.04	0.18	0.79	0.00	809.82	12.54	978	501	477	ENR
BG	PLB	2016	Corn	GroupA-0971	1.55	0.00	1.20	0.00	2941.78	18.61	1426	501	925	ENR
BBEA	PLB	2016	Corn	GroupA-0972	1.34	0.00	1.11	0.00	3296.50	16.15	3066	501	2565	ENR
6	PLB	2017	Corn	GroupA-0973	7.06	0.00	5.61	0.00	1403.96	73.71	248	508	-260	ENR
AM	PLB	2017	Corn	GroupA-0974	3.45	0.00	2.79	0.00	2601.80	36.02	1746	508	1238	ENR
CF	PLB	2017	Corn	GroupA-0975	2.62	0.01	2.14	0.00	1177.89	27.31	1099	508	591	ENR
HB	PLB	2017	Corn	GroupA-0976	3.50	0.01	2.91	0.00	1650.52	36.52	557	508	49	ENR
NH	PLB	2017	Corn	GroupA-0977	9.17	0.00	7.99	0.00	3474.91	95.80	226	508	-282	ENR
PB	PLB	2017	Corn	GroupA-0978	2.68	0.08	1.90	0.00	1437.03	28.01	338	508	-170	ENR
PTB	PLB	2017	Corn	GroupA-0979	7.66	0.02	7.13	0.00	2652.61	80.04	296	508	-212	ENR
PL	PLB	2017	Corn	GroupA-0980	2.30	0.00	1.82	0.00	809.82	23.97	979	508	471	ENR
BG	PLB	2017	Corn	GroupA-0981	2.38	0.00	1.86	0.00	2941.78	24.86	1426	508	918	ENR
BBEA	PLB	2017	Corn	GroupA-0982	2.24	0.00	1.79	0.00	3296.50	23.44	2889	508	2381	ENR
JL	PLB	2017	Corn	GroupA-0983	7.45	0.04	5.55	0.00	31878.96	77.76	862	508	354	ENR
BS	PLB	2017	Corn	GroupA-0984	3.61	0.00	2.94	0.00	4109.93	37.69	757	508	249	ENR
AM	PLB	2018	Corn	GroupA-0986	4.15	0.04	3.38	0.00	2601.80	74.06	1727	506	1221	ENR
CF	PLB	2018	Corn	GroupA-0987	2.74	0.06	2.16	0.00	1177.89	48.84	1098	506	592	ENR
HB	PLB	2018	Corn	GroupA-0988	4.55	0.09	3.65	0.00	1650.52	81.21	363	506	-143	ENR
NH	PLB	2018	Corn	GroupA-0989	4.48	0.00	3.28	0.00	3474.91	79.97	222	506	-284	ENR
PL	PLB	2018	Corn	GroupA-0990	2.84	0.01	2.32	0.00	809.82	50.73	974	506	468	ENR
BG	PLB	2018	Corn	GroupA-0991	3.05	0.02	2.42	0.00	2941.78	54.39	1421	506	915	ENR
BBEA	PLB	2018	Corn	GroupA-0992	2.63	0.02	2.17	0.01	3296.50	46.92	3047	506	2541	ENR
AM	PLB	2020	Corn	GroupA-0994	2.01	0.03	1.67	0.00	2601.80	21.61	742	498	244	ENR
CF	PLB	2020	Corn	GroupA-0995	2.02	0.00	1.47	0.00	1177.89	21.73	1095	498	597	ENR
PB	PLB	2020	Corn	GroupA-0996	3.14	0.00	2.53	0.00	1437.03	33.81	333	498	-165	ENR
PE	PLB	2020	Corn	GroupA-0997	4.18	0.01	3.71	0.00	1832.05	45.02	942	498	444	ENR
PW	PLB	2020	Corn	GroupA-0998	3.95	0.02	3.31	0.00	2110.84	42.57	260	498	-238	ENR
PL	PLB	2020	Corn	GroupA-0999	2.25	0.00	1.80	0.00	809.82	24.28	976	498	478	ENR
JL	PLB	2020	Corn	GroupA-1000	3.76	0.01	3.08	0.00	31878.96	40.49	889	498	391	ENR
6	BG	2016	Corn	GroupA-1001	2.96	0.00	2.18	0.00	3938.74	34.27	249	1426	-1177	ENR
AM	BG	2016	Corn	GroupA-1002	1.89	0.04	1.49	0.00	4801.99	21.90	1759	1426	333	ENR
HB	BG	2016	Corn	GroupA-1003	3.39	0.03	2.41	0.00	4415.29	39.34	366	1426	-1060	ENR
NH	BG	2016	Corn	GroupA-1004	4.29	0.00	3.59	0.00	4995.12	49.76	222	1426	-1204	ENR
PL	BG	2016	Corn	GroupA-1005	1.72	0.00	1.34	0.00	3360.23	19.95	978	1426	-448	ENR
PLB	BG	2016	Corn	GroupA-1006	2.04	0.03	1.57	0.00	2941.78	23.59	501	1426	-925	ENR
BBEA	BG	2016	Corn	GroupA-1007	1.83	0.05	1.45	0.00	438.12	21.22	3066	1426	1640	ENR
6	BG	2017	Corn	GroupA-1008	6.68	0.10	5.28	0.00	3938.74	71.32	248	1426	-1178	ENR
AM	BG	2017	Corn	GroupA-1009	3.96	0.02	3.16	0.00	4801.99	42.29	1746	1426	320	ENR
CF	BG	2017	Corn	GroupA-1010	3.90	0.06	2.95	0.00	3976.07	41.57	1099	1426	-327	ENR
HB	BG	2017	Corn	GroupA-1011	3.37	0.03	2.69	0.00	4415.29	35.99	557	1426	-869	ENR
NH	BG	2017	Corn	GroupA-1012	6.21	0.00	4.72	0.00	4995.12	66.28	226	1426	-1200	ENR
PB	BG	2017	Corn	GroupA-1013	5.93	0.17	4.76	0.00	3001.92	63.26	338	1426	-1088	ENR
PTB	BG	2017	Corn	GroupA-1014	5.59	0.03	4.80	0.00	5528.32	59.63	296	1426	-1130	ENR
PL	BG	2017	Corn	GroupA-1015	3.65	0.19	2.84	0.00	3360.23	38.94	979	1426	-447	ENR
PLB	BG	2017	Corn	GroupA-1016	4.29	0.08	3.40	0.00	2941.78	45.73	508	1426	-918	ENR
BBEA	BG	2017	Corn	GroupA-1017	2.32	0.28	1.82	0.00	438.12	24.80	2889	1426	1463	ENR
JL	BG	2017	Corn	GroupA-1018	8.00	0.12	6.57	0.00	34820.43	85.36	862	1426	-564	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BS	BG	2017	Corn	GroupA-1019	3.50	0.21	2.89	0.00	7029.70	37.31	757	1426	-669	ENR
AM	BG	2018	Corn	GroupA-1021	3.72	0.02	2.72	0.00	4801.99	48.15	1727	1421	306	ENR
CF	BG	2018	Corn	GroupA-1022	2.80	0.05	2.20	0.00	3976.07	36.23	1098	1421	-323	ENR
HB	BG	2018	Corn	GroupA-1023	7.11	0.16	6.28	0.00	4415.29	91.94	363	1421	-1058	ENR
NH	BG	2018	Corn	GroupA-1024	4.54	0.01	3.57	0.00	4995.12	58.67	222	1421	-1199	ENR
PL	BG	2018	Corn	GroupA-1025	3.86	0.02	2.84	0.00	3360.23	49.89	974	1421	-447	ENR
PLB	BG	2018	Corn	GroupA-1026	3.46	0.06	2.90	0.00	2941.78	44.80	506	1421	-915	ENR
BBEA	BG	2018	Corn	GroupA-1027	2.40	0.26	1.90	0.00	438.12	30.99	3047	1421	1626	ENR
JL	BG	2018	Corn	GroupA-1028	6.10	0.02	5.14	0.00	34820.43	78.94	901	1421	-520	ENR
6	BG	2019	Corn	GroupA-1029	2.98	0.03	2.45	0.00	3938.74	39.85	246	1428	-1182	ENR
AM	BG	2019	Corn	GroupA-1030	3.27	0.07	2.67	0.00	4801.99	43.70	992	1428	-436	ENR
HB	BG	2019	Corn	GroupA-1031	7.12	0.02	5.88	0.00	4415.29	95.07	365	1428	-1063	ENR
BBEA	BG	2019	Corn	GroupA-1033	2.24	0.06	1.73	0.00	438.12	29.85	3067	1428	1639	ENR
BS	BG	2019	Corn	GroupA-1034	6.70	0.02	4.93	0.00	7029.70	89.41	749	1428	-679	ENR
BBEA	BG	2021	Corn	GroupA-1035	2.36	0.11	1.98	0.01	438.12	22.77	3029	1430	1599	ENR
BS	BG	2021	Corn	GroupA-1036	6.15	0.00	4.72	0.00	7029.70	59.18	645	1430	-785	ENR
6	BBEA	2016	Corn	GroupA-1037	3.35	0.00	2.47	0.00	4348.89	41.41	249	3066	-2817	ENR
AM	BBEA	2016	Corn	GroupA-1038	1.84	0.06	1.35	0.00	5233.55	22.73	1759	3066	-1307	ENR
HB	BBEA	2016	Corn	GroupA-1039	3.09	0.01	2.31	0.00	4811.25	38.26	366	3066	-2700	ENR
NH	BBEA	2016	Corn	GroupA-1040	3.76	0.00	2.84	0.00	5431.98	46.57	222	3066	-2844	ENR
PL	BBEA	2016	Corn	GroupA-1041	2.37	0.01	1.85	0.00	3759.77	29.26	978	3066	-2088	ENR
PLB	BBEA	2016	Corn	GroupA-1042	2.54	0.00	1.99	0.00	3296.50	31.41	501	3066	-2565	ENR
BG	BBEA	2016	Corn	GroupA-1043	1.84	0.05	1.35	0.00	438.12	22.76	1426	3066	-1640	ENR
6	BBEA	2017	Corn	GroupA-1044	6.09	0.03	4.72	0.00	4348.89	57.10	248	2889	-2641	ENR
AM	BBEA	2017	Corn	GroupA-1045	3.45	0.03	2.72	0.00	5233.55	32.35	1746	2889	-1143	ENR
CF	BBEA	2017	Corn	GroupA-1046	3.79	0.00	2.99	0.00	4282.54	35.57	1099	2889	-1790	ENR
HB	BBEA	2017	Corn	GroupA-1047	4.28	0.05	3.48	0.00	4811.25	40.08	557	2889	-2332	ENR
NH	BBEA	2017	Corn	GroupA-1048	8.85	0.01	7.05	0.00	5431.98	82.94	226	2889	-2663	ENR
PB	BBEA	2017	Corn	GroupA-1049	7.00	0.15	5.76	0.00	3203.03	65.61	338	2889	-2551	ENR
PTB	BBEA	2017	Corn	GroupA-1050	6.44	0.10	5.21	0.00	5911.78	60.41	296	2889	-2593	ENR
PL	BBEA	2017	Corn	GroupA-1051	3.82	0.13	3.09	0.00	3759.77	35.78	979	2889	-1910	ENR
PLB	BBEA	2017	Corn	GroupA-1052	4.41	0.04	3.65	0.00	3296.50	41.35	508	2889	-2381	ENR
BG	BBEA	2017	Corn	GroupA-1053	2.39	0.24	1.82	0.00	438.12	22.37	1426	2889	-1463	ENR
JL	BBEA	2017	Corn	GroupA-1054	9.43	0.07	8.27	0.00	35161.19	88.41	862	2889	-2027	ENR
BS	BBEA	2017	Corn	GroupA-1055	4.42	0.16	3.51	0.00	7352.54	41.43	757	2889	-2132	ENR
6	BBEA	2018	Corn	GroupA-1056	6.10	0.04	4.65	0.00	4348.89	78.60	244	3047	-2803	ENR
AM	BBEA	2018	Corn	GroupA-1057	3.70	0.04	2.84	0.00	5233.55	47.66	1727	3047	-1320	ENR
CF	BBEA	2018	Corn	GroupA-1058	2.77	0.10	2.23	0.00	4282.54	35.64	1098	3047	-1949	ENR
HB	BBEA	2018	Corn	GroupA-1059	6.54	0.17	5.51	0.00	4811.25	84.24	363	3047	-2684	ENR
NH	BBEA	2018	Corn	GroupA-1060	4.05	0.02	3.33	0.00	5431.98	52.12	222	3047	-2825	ENR
PL	BBEA	2018	Corn	GroupA-1061	4.32	0.04	3.37	0.00	3759.77	55.64	974	3047	-2073	ENR
PLB	BBEA	2018	Corn	GroupA-1062	3.83	0.02	3.05	0.00	3296.50	49.35	506	3047	-2541	ENR
BG	BBEA	2018	Corn	GroupA-1063	2.68	0.19	2.08	0.00	438.12	34.49	1421	3047	-1626	ENR
JL	BBEA	2018	Corn	GroupA-1064	7.50	0.03	6.42	0.00	35161.19	96.52	901	3047	-2146	ENR
6	BBEA	2019	Corn	GroupA-1065	3.94	0.02	3.09	0.00	4348.89	54.63	246	3067	-2821	ENR
AM	BBEA	2019	Corn	GroupA-1066	2.67	0.04	2.20	0.00	5233.55	37.07	992	3067	-2075	ENR
HB	BBEA	2019	Corn	GroupA-1067	6.48	0.00	5.18	0.00	4811.25	89.96	365	3067	-2702	ENR
BG	BBEA	2019	Corn	GroupA-1069	2.21	0.08	1.73	0.00	438.12	30.73	1428	3067	-1639	ENR
BG	BBEA	2021	Corn	GroupA-1071	2.86	0.10	2.17	0.00	438.12	30.02	1430	3029	-1599	ENR
BS	BBEA	2021	Corn	GroupA-1072	5.82	0.01	4.75	0.00	7352.54	61.14	645	3029	-2384	ENR
CS	AA	2015	Corn	GroupA-1073	2.65	0.10	2.08	0.00	1521.14	22.63	2451	3961	-1510	ENR
CS	AA	2016	Corn	GroupA-1075	2.33	0.31	1.76	0.00	1521.14	23.92	2440	3973	-1533	ENR
SP	AA	2016	Corn	GroupA-1076	2.89	0.14	2.27	0.00	3305.23	29.63	1988	3973	-1985	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CS	AA	2017	Corn	GroupA-1077	2.83	0.11	2.20	0.00	1521.14	22.79	2373	3860	-1487	ENR
SP	AA	2017	Corn	GroupA-1078	3.05	0.09	2.29	0.00	3305.23	24.56	1799	3860	-2061	ENR
RD	AA	2017	Corn	GroupA-1079	8.09	0.01	6.45	0.00	28035.93	65.09	1261	3860	-2599	ENR
CS	AA	2018	Corn	GroupA-1080	4.16	0.05	3.30	0.00	1521.14	37.08	2437	3975	-1538	ENR
SP	AA	2018	Corn	GroupA-1081	4.37	0.07	3.42	0.00	3305.23	38.96	1988	3975	-1987	ENR
1P	AA	2020	Corn	GroupA-1084	7.73	0.01	7.30	0.00	14966.67	61.33	770	3962	-3192	ENR
2PB	AA	2020	Corn	GroupA-1085	3.14	0.01	2.58	0.00	14577.73	24.93	1769	3962	-2193	ENR
AA	CS	2015	Corn	GroupA-1086	3.09	0.15	2.41	0.00	1521.14	35.27	3961	2451	1510	ENR
AA	CS	2016	Corn	GroupA-1088	2.06	0.50	1.68	0.00	1521.14	22.85	3973	2440	1533	ENR
SP	CS	2016	Corn	GroupA-1089	3.30	0.19	2.36	0.00	2392.70	36.70	1988	2440	-452	ENR
AA	CS	2017	Corn	GroupA-1090	2.00	0.14	1.55	0.00	1521.14	16.48	3860	2373	1487	ENR
SP	CS	2017	Corn	GroupA-1091	2.21	0.10	1.70	0.00	2392.70	18.26	1799	2373	-574	ENR
RD	CS	2017	Corn	GroupA-1092	11.10	0.03	8.40	0.00	28340.32	91.49	1261	2373	-1112	ENR
AA	CS	2018	Corn	GroupA-1093	3.04	0.13	2.51	0.00	1521.14	26.50	3975	2437	1538	ENR
SP	CS	2018	Corn	GroupA-1094	4.49	0.00	3.55	0.00	2392.70	39.16	1988	2437	-449	ENR
SP	CS	2019	Corn	GroupA-1097	3.35	0.02	2.75	0.00	2392.70	30.73	1989	2440	-451	ENR
SP	CS	2021	Corn	GroupA-1099	2.25	0.01	1.83	0.00	2392.70	15.82	1978	2437	-459	ENR
MP	CS	2021	Corn	GroupA-1100	8.02	0.03	7.71	0.00	10327.57	56.48	924	2437	-1513	ENR
6	JL	2017	Corn	GroupA-1101	5.50	0.02	4.51	0.00	31086.42	43.33	248	862	-614	ENR
AM	JL	2017	Corn	GroupA-1102	3.40	0.03	2.96	0.00	30699.89	26.77	1746	862	884	ENR
CF	JL	2017	Corn	GroupA-1103	7.97	0.13	7.39	0.00	30895.46	62.81	1099	862	237	ENR
HB	JL	2017	Corn	GroupA-1104	3.46	0.01	3.00	0.00	30527.42	27.27	557	862	-305	ENR
NH	JL	2017	Corn	GroupA-1105	8.87	0.10	7.61	0.00	31398.77	69.92	226	862	-636	ENR
PB	JL	2017	Corn	GroupA-1106	5.88	0.12	5.06	0.00	32178.80	46.38	338	862	-524	ENR
PTB	JL	2017	Corn	GroupA-1107	8.90	0.08	7.96	0.00	29375.83	70.12	296	862	-566	ENR
PL	JL	2017	Corn	GroupA-1108	4.09	0.03	3.60	0.00	31562.14	32.25	979	862	117	ENR
PLB	JL	2017	Corn	GroupA-1109	5.86	0.05	5.21	0.00	31878.96	46.20	508	862	-354	ENR
BG	JL	2017	Corn	GroupA-1110	3.15	0.01	2.71	0.00	34820.43	24.80	1426	862	564	ENR
BBEA	JL	2017	Corn	GroupA-1111	3.65	0.01	3.19	0.00	35161.19	28.76	2889	862	2027	ENR
BS	JL	2017	Corn	GroupA-1112	3.27	0.01	2.73	0.00	27818.58	25.77	757	862	-105	ENR
6	JL	2018	Corn	GroupA-1113	6.62	0.03	5.29	0.00	31086.42	79.20	244	901	-657	ENR
AM	JL	2018	Corn	GroupA-1114	2.82	0.13	2.34	0.00	30699.89	33.77	1727	901	826	ENR
CF	JL	2018	Corn	GroupA-1115	3.73	0.02	3.10	0.00	30895.46	44.66	1098	901	197	ENR
NH	JL	2018	Corn	GroupA-1117	4.22	0.00	3.54	0.00	31398.77	50.50	222	901	-679	ENR
PL	JL	2018	Corn	GroupA-1118	5.31	0.07	4.19	0.00	31562.14	63.56	974	901	73	ENR
PLB	JL	2018	Corn	GroupA-1119	5.59	0.12	4.71	0.00	31878.96	66.86	506	901	-395	ENR
BG	JL	2018	Corn	GroupA-1120	2.94	0.04	2.42	0.00	34820.43	35.17	1421	901	520	ENR
BBEA	JL	2018	Corn	GroupA-1121	3.64	0.00	3.06	0.00	35161.19	43.56	3047	901	2146	ENR
AM	JL	2020	Corn	GroupA-1122	3.20	0.02	2.79	0.00	30699.89	29.14	742	889	-147	ENR
CF	JL	2020	Corn	GroupA-1123	4.16	0.01	3.72	0.00	30895.46	37.91	1095	889	206	ENR
PB	JL	2020	Corn	GroupA-1124	4.31	0.08	3.74	0.00	32178.80	39.32	333	889	-556	ENR
PE	JL	2020	Corn	GroupA-1125	2.59	0.05	2.01	0.00	31805.51	23.58	942	889	53	ENR
PW	JL	2020	Corn	GroupA-1126	3.99	0.03	3.16	0.00	31235.93	36.34	260	889	-629	ENR
PL	JL	2020	Corn	GroupA-1127	2.21	0.01	1.78	0.00	31562.14	20.19	976	889	87	ENR
PLB	JL	2020	Corn	GroupA-1128	3.02	0.00	2.62	0.00	31878.96	27.58	498	889	-391	ENR
AA	SP	2016	Corn	GroupA-1129	2.24	0.47	1.79	0.00	3305.23	25.69	3973	1988	1985	ENR
CS	SP	2016	Corn	GroupA-1130	2.28	0.50	1.53	0.00	2392.70	26.11	2440	1988	452	ENR
AA	SP	2017	Corn	GroupA-1131	2.51	0.19	1.95	0.00	3305.23	19.91	3860	1799	2061	ENR
CS	SP	2017	Corn	GroupA-1132	2.96	0.00	2.43	0.00	2392.70	23.51	2373	1799	574	ENR
RD	SP	2017	Corn	GroupA-1133	8.79	0.06	7.26	0.00	30697.43	69.75	1261	1799	-538	ENR
AA	SP	2018	Corn	GroupA-1134	2.85	0.13	2.19	0.00	3305.23	27.74	3975	1988	1987	ENR
CS	SP	2018	Corn	GroupA-1135	2.80	0.18	2.18	0.00	2392.70	27.26	2437	1988	449	ENR
CS	SP	2019	Corn	GroupA-1138	2.56	0.18	2.02	0.00	2392.70	24.43	2440	1989	451	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CS	SP	2021	Corn	GroupA-1140	2.10	0.17	1.60	0.00	2392.70	15.84	2437	1978	459	ENR
MP	SP	2021	Corn	GroupA-1141	5.82	0.04	5.38	0.00	10398.84	43.89	924	1978	-1054	ENR
AA	1P	2018	Corn	GroupA-1142	6.87	0.05	5.65	0.00	14966.67	66.56	3975	770	3205	ENR
2PB	1P	2018	Corn	GroupA-1145	3.06	0.00	2.51	0.00	884.63	29.63	1764	770	994	ENR
AA	1P	2020	Corn	GroupA-1146	2.98	0.00	2.55	0.00	14966.67	23.55	3962	770	3192	ENR
2PB	1P	2020	Corn	GroupA-1147	1.57	0.14	1.21	0.00	884.63	12.46	1769	770	999	ENR
AA	2PB	2018	Corn	GroupA-1148	6.04	0.00	5.01	0.00	14577.73	56.78	3975	1764	2211	ENR
CS	2PB	2018	Corn	GroupA-1149	9.92	0.02	8.18	0.00	13145.07	93.19	2437	1764	673	ENR
1P	2PB	2018	Corn	GroupA-1151	4.09	0.05	3.30	0.00	884.63	38.45	770	1764	-994	ENR
AA	2PB	2020	Corn	GroupA-1152	3.49	0.02	2.90	0.00	14577.73	29.15	3962	1769	2193	ENR
1P	2PB	2020	Corn	GroupA-1153	2.43	0.04	1.80	0.00	884.63	20.28	770	1769	-999	ENR
CS	MP	2021	Corn	GroupA-1154	2.55	0.12	2.09	0.00	10327.57	23.69	2437	924	1513	ENR
SP	MP	2021	Corn	GroupA-1155	4.81	0.00	4.13	0.00	10398.84	44.70	1978	924	1054	ENR
6	BS	2017	Corn	GroupA-1156	6.38	0.00	5.41	0.00	3688.53	69.46	248	757	-509	ENR
AM	BS	2017	Corn	GroupA-1157	3.95	0.02	3.19	0.00	4011.02	43.01	1746	757	989	ENR
CF	BS	2017	Corn	GroupA-1158	6.07	0.05	5.43	0.00	3076.95	66.07	1099	757	342	ENR
HB	BS	2017	Corn	GroupA-1159	3.31	0.04	2.65	0.00	3100.07	36.05	557	757	-200	ENR
NH	BS	2017	Corn	GroupA-1160	8.66	0.01	7.18	0.00	5253.94	94.24	226	757	-531	ENR
PB	BS	2017	Corn	GroupA-1161	4.44	0.00	3.66	0.00	4411.96	48.38	338	757	-419	ENR
PTB	BS	2017	Corn	GroupA-1162	4.86	0.00	3.98	0.00	2114.72	52.91	296	757	-461	ENR
PL	BS	2017	Corn	GroupA-1163	2.95	0.01	2.31	0.00	3972.53	32.06	979	757	222	ENR
PLB	BS	2017	Corn	GroupA-1164	2.80	0.02	2.27	0.00	4109.93	30.52	508	757	-249	ENR
BG	BS	2017	Corn	GroupA-1165	2.68	0.01	2.10	0.00	7029.70	29.22	1426	757	669	ENR
BBEA	BS	2017	Corn	GroupA-1166	2.84	0.00	2.21	0.00	7352.54	30.92	2889	757	2132	ENR
JL	BS	2017	Corn	GroupA-1167	9.18	0.03	8.03	0.00	27818.58	99.94	862	757	105	ENR
6	BS	2019	Corn	GroupA-1168	4.40	0.01	3.82	0.00	3688.53	46.08	246	749	-503	ENR
AM	BS	2019	Corn	GroupA-1169	4.00	0.01	3.53	0.00	4011.02	41.88	992	749	243	ENR
HB	BS	2019	Corn	GroupA-1170	7.73	0.02	6.57	0.00	3100.07	80.95	365	749	-384	ENR
NH	BS	2019	Corn	GroupA-1171	7.38	0.00	6.04	0.00	5253.94	77.27	215	749	-534	ENR
BG	BS	2019	Corn	GroupA-1172	2.94	0.00	2.61	0.00	7029.70	30.81	1428	749	679	ENR
BBEA	BS	2019	Corn	GroupA-1173	3.27	0.01	2.90	0.00	7352.54	34.30	3067	749	2318	ENR
BG	BS	2021	Corn	GroupA-1174	4.26	0.02	3.59	0.00	7029.70	51.98	1430	645	785	ENR
BBEA	BS	2021	Corn	GroupA-1175	2.66	0.06	2.10	0.01	7352.54	32.45	3029	645	2384	ENR
AA	RD	2015	Corn	GroupA-1176	6.14	0.00	5.16	0.00	28035.93	70.45	3961	1261	2700	ENR
CS	RD	2015	Corn	GroupA-1177	5.57	0.00	5.08	0.00	28340.32	63.85	2451	1261	1190	ENR
AA	RD	2017	Corn	GroupA-1178	4.07	0.06	3.51	0.00	28035.93	33.87	3860	1261	2599	ENR
CS	RD	2017	Corn	GroupA-1179	2.55	0.17	2.05	0.00	28340.32	21.20	2373	1261	1112	ENR
SP	RD	2017	Corn	GroupA-1180	4.40	0.01	3.85	0.00	30697.43	36.66	1799	1261	538	ENR
CS	RD	2019	Corn	GroupA-1181	3.85	0.00	3.22	0.00	28340.32	38.56	2440	1257	1183	ENR
SP	RD	2019	Corn	GroupA-1182	5.73	0.00	4.64	0.00	30697.43	57.41	1989	1257	732	ENR
AM	6	2013	Soybeans	GroupA-0001	0.72	0.05	0.60	0.88	1216.49	18.96	1748	249	1499	SR
HB	6	2013	Soybeans	GroupA-0002	1.23	0.02	1.11	0.27	593.20	32.28	558	249	309	SR
BG	6	2013	Soybeans	GroupA-0005	1.39	0.03	1.25	0.70	3938.74	36.65	1438	249	1189	SR
BBEA	6	2013	Soybeans	GroupA-0006	1.61	0.09	1.52	1.74	4348.89	42.36	3081	249	2832	SR
BS	6	2013	Soybeans	GroupA-0009	1.40	0.00	0.73	0.32	3688.53	36.74	656	249	407	SR
AM	6	2014	Soybeans	GroupA-0010	0.75	0.00	0.65	0.89	1216.49	17.27	1748	250	1498	SR
HB	6	2014	Soybeans	GroupA-0011	2.27	0.18	2.01	0.28	593.20	51.85	555	250	305	SR
PL	6	2014	Soybeans	GroupA-0014	0.62	0.05	0.52	0.47	632.74	14.16	974	250	724	SR
PLB	6	2014	Soybeans	GroupA-0015	1.67	0.03	1.49	0.25	1403.96	38.19	500	250	250	SR
BG	6	2014	Soybeans	GroupA-0016	2.78	0.02	2.71	0.71	3938.74	63.53	1438	250	1188	SR
BBEA	6	2014	Soybeans	GroupA-0017	2.72	0.08	2.66	1.59	4348.89	62.18	3084	250	2834	SR
BS	6	2014	Soybeans	GroupA-0019	2.79	0.00	2.35	0.32	3688.53	63.77	656	250	406	SR
AM	6	2015	Soybeans	GroupA-0020	0.70	0.02	0.62	0.79	1216.49	26.73	1467	251	1216	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CF	6	2015	Soybeans	GroupA-0021	0.89	0.05	0.68	0.58	1790.97	33.76	1097	251	846	SR
HB	6	2015	Soybeans	GroupA-0022	2.08	0.17	1.95	0.29	593.20	78.74	549	251	298	SR
PTB	6	2015	Soybeans	GroupA-0024	1.99	0.01	1.58	0.17	1728.12	75.65	303	251	52	SR
PL	6	2015	Soybeans	GroupA-0025	0.67	0.09	0.58	0.47	632.74	25.42	905	251	654	SR
PLB	6	2015	Soybeans	GroupA-0026	2.05	0.02	1.87	0.31	1403.96	77.91	499	251	248	SR
BG	6	2015	Soybeans	GroupA-0027	1.81	0.00	1.74	0.75	3938.74	68.62	1384	251	1133	SR
BBEA	6	2015	Soybeans	GroupA-0028	1.83	0.00	1.76	1.56	4348.89	69.28	2811	251	2560	SR
BS	6	2015	Soybeans	GroupA-0029	1.63	0.05	0.79	0.35	3688.53	61.83	659	251	408	SR
AM	6	2020	Soybeans	GroupA-0030	0.68	0.02	0.45	0.52	1216.49	18.46	991	247	744	SR
HB	6	2020	Soybeans	GroupA-0031	0.76	0.01	0.61	0.30	593.20	20.53	555	247	308	SR
BG	6	2020	Soybeans	GroupA-0034	0.62	0.01	0.51	0.70	3938.74	16.67	1436	247	1189	SR
BBEA	6	2020	Soybeans	GroupA-0035	0.72	0.02	0.62	1.57	4348.89	19.31	3036	247	2789	SR
BS	6	2020	Soybeans	GroupA-0036	1.27	0.00	1.02	0.39	3688.53	34.23	748	247	501	SR
AM	6	2021	Soybeans	GroupA-0037	0.78	0.06	0.61	0.87	1216.49	20.15	1730	246	1484	SR
CF	6	2021	Soybeans	GroupA-0038	0.97	0.00	0.70	0.52	1790.97	25.08	1090	246	844	SR
HB	6	2021	Soybeans	GroupA-0039	0.99	0.00	0.77	0.18	593.20	25.74	363	246	117	SR
PE	6	2021	Soybeans	GroupA-0042	2.88	0.01	2.51	0.45	3050.40	74.54	938	246	692	SR
PW	6	2021	Soybeans	GroupA-0043	2.19	0.01	1.53	0.01	3135.13	56.67	246	246	0	SR
PL	6	2021	Soybeans	GroupA-0045	0.95	0.04	0.79	0.48	632.74	24.56	978	246	732	SR
BS	6	2021	Soybeans	GroupA-0048	3.02	0.00	2.60	0.04	3688.53	78.23	85	246	-161	SR
6	AM	2013	Soybeans	GroupA-0049	2.53	0.00	1.94	0.02	1216.49	78.34	249	1748	-1499	SR
HB	AM	2013	Soybeans	GroupA-0050	1.30	0.00	1.11	0.04	1351.32	40.04	558	1748	-1190	SR
BG	AM	2013	Soybeans	GroupA-0053	0.88	0.02	0.70	0.13	4801.99	27.12	1438	1748	-310	SR
BBEA	AM	2013	Soybeans	GroupA-0054	1.18	0.06	0.98	0.33	5233.55	36.59	3081	1748	1333	SR
BS	AM	2013	Soybeans	GroupA-0057	1.05	0.04	0.75	0.05	4011.02	32.58	656	1748	-1092	SR
HB	AM	2014	Soybeans	GroupA-0059	1.96	0.01	1.61	0.04	1351.32	50.12	555	1748	-1193	SR
PL	AM	2014	Soybeans	GroupA-0062	1.02	0.05	0.82	0.07	1797.09	26.18	974	1748	-774	SR
PLB	AM	2014	Soybeans	GroupA-0063	2.59	0.07	2.21	0.04	2601.80	66.23	500	1748	-1248	SR
BG	AM	2014	Soybeans	GroupA-0064	2.31	0.07	2.18	0.13	4801.99	59.00	1438	1748	-310	SR
BBEA	AM	2014	Soybeans	GroupA-0065	2.24	0.07	2.11	0.30	5233.55	57.32	3084	1748	1336	SR
BS	AM	2014	Soybeans	GroupA-0067	2.06	0.07	1.84	0.05	4011.02	52.62	656	1748	-1092	SR
6	AM	2015	Soybeans	GroupA-0068	1.37	0.00	1.05	0.02	1216.49	66.61	251	1467	-1216	SR
CF	AM	2015	Soybeans	GroupA-0069	1.35	0.00	1.22	0.13	2925.31	65.49	1097	1467	-370	SR
PTB	AM	2015	Soybeans	GroupA-0072	1.81	0.01	1.44	0.04	1901.85	87.88	303	1467	-1164	SR
PL	AM	2015	Soybeans	GroupA-0073	0.87	0.04	0.69	0.11	1797.09	42.02	905	1467	-562	SR
BG	AM	2015	Soybeans	GroupA-0075	1.40	0.00	1.29	0.22	4801.99	68.10	1384	1467	-83	SR
BBEA	AM	2015	Soybeans	GroupA-0076	1.35	0.00	1.23	0.43	5233.55	65.33	2811	1467	1344	SR
BS	AM	2015	Soybeans	GroupA-0077	0.96	0.00	0.73	0.05	4011.02	46.78	659	1467	-808	SR
CF	AM	2019	Soybeans	GroupA-0078	0.89	0.01	0.73	0.18	2925.31	32.32	1095	745	350	SR
PE	AM	2019	Soybeans	GroupA-0081	1.86	0.01	1.66	0.11	4256.93	67.54	942	745	197	SR
PL	AM	2019	Soybeans	GroupA-0084	0.99	0.00	0.80	0.12	1797.09	35.89	968	745	223	SR
PLB	AM	2019	Soybeans	GroupA-0085	1.39	0.01	1.14	0.06	2601.80	50.52	502	745	-243	SR
JL	AM	2019	Soybeans	GroupA-0086	1.73	0.01	1.47	0.06	30699.89	62.81	888	745	143	SR
6	AM	2020	Soybeans	GroupA-0087	2.72	0.01	2.15	0.02	1216.49	63.73	247	991	-744	SR
HB	AM	2020	Soybeans	GroupA-0088	1.09	0.01	0.85	0.03	1351.32	25.49	555	991	-436	SR
BG	AM	2020	Soybeans	GroupA-0091	0.94	0.01	0.81	0.13	4801.99	21.96	1436	991	445	SR
BBEA	AM	2020	Soybeans	GroupA-0092	0.95	0.00	0.84	0.30	5233.55	22.18	3036	991	2045	SR
BS	AM	2020	Soybeans	GroupA-0093	1.28	0.02	1.02	0.06	4011.02	30.00	748	991	-243	SR
6	AM	2021	Soybeans	GroupA-0094	2.65	0.00	2.15	0.02	1216.49	75.10	246	1730	-1484	SR
CF	AM	2021	Soybeans	GroupA-0095	1.11	0.01	0.83	0.08	2925.31	31.52	1090	1730	-640	SR
HB	AM	2021	Soybeans	GroupA-0096	1.71	0.05	1.35	0.03	1351.32	48.50	363	1730	-1367	SR
PL	AM	2021	Soybeans	GroupA-0102	1.10	0.01	0.82	0.07	1797.09	31.26	978	1730	-752	SR
BS	AM	2021	Soybeans	GroupA-0105	2.46	0.07	2.04	0.01	4011.02	69.72	85	1730	-1645	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PL	CF	2012	Soybeans	GroupA-0107	1.53	0.06	1.25	0.40	1531.30	39.87	855	1099	-244	SR
PLB	CF	2012	Soybeans	GroupA-0108	1.40	0.00	1.08	0.20	1177.89	36.61	502	1099	-597	SR
6	CF	2015	Soybeans	GroupA-0111	2.16	0.04	1.57	0.02	1790.97	64.60	251	1097	-846	SR
AM	CF	2015	Soybeans	GroupA-0112	1.80	0.07	1.67	0.43	2925.31	53.88	1467	1097	370	SR
HB	CF	2015	Soybeans	GroupA-0113	2.37	0.01	2.22	0.24	1609.48	71.02	549	1097	-548	SR
PL	CF	2015	Soybeans	GroupA-0116	0.94	0.04	0.77	0.36	1531.30	28.06	905	1097	-192	SR
PLB	CF	2015	Soybeans	GroupA-0117	0.89	0.01	0.69	0.23	1177.89	26.77	499	1097	-598	SR
BG	CF	2015	Soybeans	GroupA-0118	2.67	0.01	2.60	0.69	3976.07	79.89	1384	1097	287	SR
BBEA	CF	2015	Soybeans	GroupA-0119	2.59	0.00	2.53	1.46	4282.54	77.65	2811	1097	1714	SR
BS	CF	2015	Soybeans	GroupA-0120	2.11	0.00	1.95	0.06	3076.95	63.03	659	1097	-438	SR
BS	CF	2016	Soybeans	GroupA-0124	1.42	0.02	1.27	0.06	3076.95	40.20	655	1083	-428	SR
AM	CF	2019	Soybeans	GroupA-0125	2.19	0.01	1.86	0.21	2925.31	63.24	745	1095	-350	SR
PE	CF	2019	Soybeans	GroupA-0128	0.75	0.00	0.56	0.20	1470.34	21.60	942	1095	-153	SR
PL	CF	2019	Soybeans	GroupA-0131	0.71	0.05	0.55	0.39	1531.30	20.46	968	1095	-127	SR
PLB	CF	2019	Soybeans	GroupA-0132	1.49	0.00	0.88	0.22	1177.89	42.90	502	1095	-593	SR
JL	CF	2019	Soybeans	GroupA-0133	2.41	0.01	1.89	0.07	30895.46	69.54	888	1095	-207	SR
AM	CF	2021	Soybeans	GroupA-0135	1.44	0.01	1.12	0.51	2925.31	32.35	1730	1090	640	SR
HB	CF	2021	Soybeans	GroupA-0136	1.47	0.01	1.07	0.04	1609.48	33.15	363	1090	-727	SR
PE	CF	2021	Soybeans	GroupA-0139	1.66	0.00	1.34	0.22	1470.34	37.29	938	1090	-152	SR
PL	CF	2021	Soybeans	GroupA-0142	1.30	0.00	0.94	0.39	1531.30	29.22	978	1090	-112	SR
PLB	CF	2021	Soybeans	GroupA-0143	3.48	0.00	2.63	0.20	1177.89	78.27	491	1090	-599	SR
6	HB	2013	Soybeans	GroupA-0146	2.32	0.01	1.68	0.02	593.20	81.99	249	558	-309	SR
AM	HB	2013	Soybeans	GroupA-0147	0.82	0.01	0.68	0.52	1351.32	29.03	1748	558	1190	SR
BG	HB	2013	Soybeans	GroupA-0150	0.80	0.00	0.65	0.71	4415.29	28.22	1438	558	880	SR
BBEA	HB	2013	Soybeans	GroupA-0151	0.69	0.00	0.59	1.89	4811.25	24.53	3081	558	2523	SR
BS	HB	2013	Soybeans	GroupA-0154	1.22	0.00	0.92	0.06	3100.07	43.04	656	558	98	SR
AM	HB	2014	Soybeans	GroupA-0156	1.32	0.03	1.12	0.52	1351.32	42.96	1748	555	1193	SR
PL	HB	2014	Soybeans	GroupA-0159	1.60	0.01	1.30	0.51	1056.49	52.31	974	555	419	SR
PLB	HB	2014	Soybeans	GroupA-0160	2.82	0.03	2.57	0.25	1650.52	92.12	500	555	-55	SR
BG	HB	2014	Soybeans	GroupA-0161	1.68	0.04	1.47	0.74	4415.29	54.93	1438	555	883	SR
BBEA	HB	2014	Soybeans	GroupA-0162	1.61	0.04	1.39	1.59	4811.25	52.64	3084	555	2529	SR
BS	HB	2014	Soybeans	GroupA-0164	2.27	0.07	1.73	0.06	3100.07	74.02	656	555	101	SR
BG	HB	2015	Soybeans	GroupA-0172	0.67	0.22	0.56	0.74	4415.29	66.73	1384	549	835	SR
BBEA	HB	2015	Soybeans	GroupA-0173	0.74	0.06	0.62	1.56	4811.25	73.75	2811	549	2262	SR
CF	HB	2016	Soybeans	GroupA-0175	1.38	0.09	1.16	0.51	1609.48	57.32	1083	181	902	SR
BS	HB	2016	Soybeans	GroupA-0178	0.76	0.00	0.62	0.06	3100.07	31.56	655	181	474	SR
PE	HB	2018	Soybeans	GroupA-0180	1.84	0.01	1.67	0.26	3020.77	51.57	941	184	757	SR
PW	HB	2018	Soybeans	GroupA-0181	1.22	0.04	1.00	0.01	2989.69	34.00	257	184	73	SR
BS	HB	2018	Soybeans	GroupA-0183	1.55	0.01	1.24	0.07	3100.07	43.30	752	184	568	SR
AM	HB	2019	Soybeans	GroupA-0184	1.18	0.00	0.92	0.20	1351.32	62.63	745	174	571	SR
CF	HB	2019	Soybeans	GroupA-0185	1.41	0.18	1.13	0.53	1609.48	75.23	1095	174	921	SR
PL	HB	2019	Soybeans	GroupA-0190	1.27	0.07	1.00	0.47	1056.49	67.68	968	174	794	SR
PLB	HB	2019	Soybeans	GroupA-0191	1.28	0.20	1.07	0.26	1650.52	68.26	502	174	328	SR
JL	HB	2019	Soybeans	GroupA-0192	1.51	0.10	1.19	0.08	30527.42	80.25	888	174	714	SR
6	HB	2020	Soybeans	GroupA-0193	2.98	0.00	2.06	0.02	593.20	92.86	247	555	-308	SR
AM	HB	2020	Soybeans	GroupA-0194	1.47	0.12	1.08	0.27	1351.32	45.70	991	555	436	SR
NH	HB	2020	Soybeans	GroupA-0195	2.75	0.27	2.22	0.01	2580.18	85.56	181	555	-374	SR
BG	HB	2020	Soybeans	GroupA-0197	1.16	0.08	0.87	0.77	4415.29	36.00	1436	555	881	SR
BBEA	HB	2020	Soybeans	GroupA-0198	1.18	0.24	0.98	1.70	4811.25	36.72	3036	555	2481	SR
BS	HB	2020	Soybeans	GroupA-0199	1.11	0.30	0.84	0.07	3100.07	34.53	748	555	193	SR
6	HB	2021	Soybeans	GroupA-0200	1.60	0.04	1.31	0.02	593.20	44.05	246	363	-117	SR
AM	HB	2021	Soybeans	GroupA-0201	0.66	0.07	0.53	0.87	1351.32	18.34	1730	363	1367	SR
CF	HB	2021	Soybeans	GroupA-0202	0.85	0.01	0.66	0.53	1609.48	23.39	1090	363	727	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PE	HB	2021	Soybeans	GroupA-0205	2.96	0.12	2.78	0.46	3020.77	81.75	938	363	575	SR
PL	HB	2021	Soybeans	GroupA-0208	0.87	0.00	0.70	0.52	1056.49	24.10	978	363	615	SR
BS	HB	2021	Soybeans	GroupA-0211	2.59	0.02	2.18	0.01	3100.07	71.43	85	363	-278	SR
6	NH	2013	Soybeans	GroupA-0212	2.01	0.12	1.37	0.04	2271.12	80.59	249	173	76	SR
AM	NH	2013	Soybeans	GroupA-0213	1.33	0.27	0.93	0.94	1283.59	53.41	1748	173	1575	SR
HB	NH	2013	Soybeans	GroupA-0214	1.20	0.06	0.87	0.09	2580.18	48.00	558	173	385	SR
BG	NH	2013	Soybeans	GroupA-0216	1.82	0.07	1.44	0.21	4995.12	73.00	1438	173	1265	SR
BBEA	NH	2013	Soybeans	GroupA-0217	1.36	0.00	0.99	0.53	5431.98	54.65	3081	173	2908	SR
AM	NH	2020	Soybeans	GroupA-0222	1.42	0.03	1.00	0.27	1283.59	43.61	991	181	810	SR
HB	NH	2020	Soybeans	GroupA-0223	1.29	0.11	0.99	0.09	2580.18	39.61	555	181	374	SR
BG	NH	2020	Soybeans	GroupA-0225	1.46	0.02	1.02	0.23	4995.12	44.93	1436	181	1255	SR
BBEA	NH	2020	Soybeans	GroupA-0226	1.17	0.03	0.87	0.46	5431.98	35.92	3036	181	2855	SR
BS	NH	2020	Soybeans	GroupA-0227	1.16	0.36	0.94	0.11	5253.94	35.70	748	181	567	SR
6	NH	2021	Soybeans	GroupA-0228	2.39	0.05	1.92	0.04	2271.12	94.33	246	51	195	SR
AM	NH	2021	Soybeans	GroupA-0229	1.10	0.09	0.69	0.94	1283.59	43.51	1730	51	1679	SR
CF	NH	2021	Soybeans	GroupA-0230	1.72	0.01	1.19	0.16	4061.52	67.71	1090	51	1039	SR
PL	NH	2021	Soybeans	GroupA-0236	1.71	0.01	1.45	0.15	2690.61	67.58	978	51	927	SR
JL	NH	2021	Soybeans	GroupA-0238	1.54	0.08	1.27	0.14	31398.77	60.69	884	51	833	SR
CF	PB	2012	Soybeans	GroupA-0240	1.20	0.02	1.04	0.17	1477.63	37.67	1099	335	764	SR
PL	PB	2012	Soybeans	GroupA-0241	1.05	0.08	0.78	0.28	2233.71	32.98	855	335	520	SR
PLB	PB	2012	Soybeans	GroupA-0242	1.68	0.00	1.34	0.14	1437.03	52.60	502	335	167	SR
CS	PB	2012	Soybeans	GroupA-0243	2.39	0.00	1.65	0.09	31668.37	74.76	1942	335	1607	SR
AM	PB	2014	Soybeans	GroupA-0246	1.89	0.04	1.12	0.08	3991.90	54.23	1748	334	1414	SR
HB	PB	2014	Soybeans	GroupA-0247	2.52	0.00	1.55	0.02	2853.21	72.19	555	334	221	SR
PL	PB	2014	Soybeans	GroupA-0249	1.29	0.06	0.87	0.03	2233.71	37.09	974	334	640	SR
PLB	PB	2014	Soybeans	GroupA-0250	1.84	0.02	1.55	0.02	1437.03	52.70	500	334	166	SR
BG	PB	2014	Soybeans	GroupA-0251	1.79	0.13	1.63	0.08	3001.92	51.39	1438	334	1104	SR
BBEA	PB	2014	Soybeans	GroupA-0252	1.95	0.03	1.75	0.18	3203.03	55.93	3084	334	2750	SR
SP	PB	2014	Soybeans	GroupA-0253	3.11	0.06	2.52	0.09	34025.37	89.32	1993	334	1659	SR
BS	PB	2014	Soybeans	GroupA-0254	2.07	0.01	1.86	0.03	4411.96	59.26	656	334	322	SR
AM	PB	2015	Soybeans	GroupA-0256	1.35	0.02	0.92	0.27	3991.90	66.71	1467	327	1140	SR
CF	PB	2015	Soybeans	GroupA-0257	1.27	0.00	1.05	0.18	1477.63	62.92	1097	327	770	SR
HB	PB	2015	Soybeans	GroupA-0258	1.47	0.03	1.26	0.07	2853.21	72.77	549	327	222	SR
PLB	PB	2015	Soybeans	GroupA-0261	1.18	0.12	0.99	0.16	1437.03	58.43	499	327	172	SR
BG	PB	2015	Soybeans	GroupA-0262	1.47	0.01	1.33	0.49	3001.92	72.83	1384	327	1057	SR
BBEA	PB	2015	Soybeans	GroupA-0263	1.05	0.01	0.90	1.11	3203.03	51.90	2811	327	2484	SR
BS	PB	2015	Soybeans	GroupA-0264	0.98	0.02	0.83	0.20	4411.96	48.67	659	327	332	SR
CF	PB	2016	Soybeans	GroupA-0265	0.98	0.02	0.77	0.20	1477.63	37.73	1083	331	752	SR
BS	PB	2016	Soybeans	GroupA-0268	2.18	0.03	1.98	0.23	4411.96	83.64	655	331	324	SR
PE	PB	2018	Soybeans	GroupA-0270	1.91	0.00	1.48	0.26	573.60	66.51	941	327	614	SR
BS	PB	2018	Soybeans	GroupA-0273	1.64	0.04	1.38	0.04	4411.96	57.05	752	327	425	SR
CF	PB	2019	Soybeans	GroupA-0275	1.94	0.14	1.64	0.20	1477.63	95.74	1095	278	817	SR
PE	PB	2019	Soybeans	GroupA-0277	1.32	0.19	1.04	0.28	573.60	64.94	942	278	664	SR
PTB	PB	2019	Soybeans	GroupA-0279	1.75	0.38	1.43	0.06	3582.30	86.47	270	278	-8	SR
AM	PB	2021	Soybeans	GroupA-0284	2.00	0.00	1.66	0.66	3991.90	71.23	1730	246	1484	SR
PE	PB	2021	Soybeans	GroupA-0288	1.40	0.48	1.12	0.28	573.60	50.03	938	246	692	SR
PTB	PB	2021	Soybeans	GroupA-0290	1.55	0.35	1.19	0.05	3582.30	55.42	251	246	5	SR
PLB	PB	2021	Soybeans	GroupA-0292	2.29	0.20	1.91	0.14	1437.03	81.78	491	246	245	SR
BS	PE	2018	Soybeans	GroupA-0299	2.99	0.05	2.48	0.06	4129.23	64.31	752	941	-189	SR
AM	PE	2019	Soybeans	GroupA-0300	3.23	0.21	2.73	0.05	4256.93	92.33	745	942	-197	SR
CF	PE	2019	Soybeans	GroupA-0301	2.09	0.09	1.12	0.08	1470.34	59.69	1095	942	153	SR
PL	PE	2019	Soybeans	GroupA-0306	1.14	0.04	0.90	0.05	2576.96	32.65	968	942	26	SR
PLB	PE	2019	Soybeans	GroupA-0307	1.22	0.10	0.90	0.03	1832.05	34.81	502	942	-440	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
JL	PE	2019	Soybeans	GroupA-0308	2.88	0.01	2.36	0.04	31805.51	82.27	888	942	-54	SR
AM	PE	2021	Soybeans	GroupA-0310	1.54	0.11	1.36	0.12	4256.93	32.62	1730	938	792	SR
CF	PE	2021	Soybeans	GroupA-0311	2.03	0.21	1.30	0.07	1470.34	43.06	1090	938	152	SR
HB	PE	2021	Soybeans	GroupA-0312	4.22	0.12	2.07	0.02	3020.77	89.52	363	938	-575	SR
PL	PE	2021	Soybeans	GroupA-0317	1.73	0.10	1.42	0.05	2576.96	36.74	978	938	40	SR
PLB	PE	2021	Soybeans	GroupA-0318	3.84	0.01	3.42	0.03	1832.05	81.48	491	938	-447	SR
PE	PW	2018	Soybeans	GroupA-0323	0.83	0.18	0.61	0.33	602.45	18.18	941	257	684	SR
PTB	PW	2018	Soybeans	GroupA-0324	1.37	0.12	1.18	0.11	3360.13	30.01	289	257	32	SR
BS	PW	2018	Soybeans	GroupA-0325	1.74	0.17	1.61	0.26	3638.27	38.03	752	257	495	SR
AM	PW	2019	Soybeans	GroupA-0326	1.27	0.01	1.03	0.26	4299.79	35.13	745	259	486	SR
CF	PW	2019	Soybeans	GroupA-0327	0.58	0.04	0.47	0.38	1380.51	16.11	1095	259	836	SR
PE	PW	2019	Soybeans	GroupA-0330	0.62	0.01	0.51	0.36	602.45	17.13	942	259	683	SR
PL	PW	2019	Soybeans	GroupA-0332	0.62	0.04	0.49	0.33	2757.07	17.10	968	259	709	SR
PLB	PW	2019	Soybeans	GroupA-0333	1.34	0.06	0.99	0.18	2110.84	37.07	502	259	243	SR
JL	PW	2019	Soybeans	GroupA-0334	1.35	0.02	1.19	0.08	31235.93	37.35	888	259	629	SR
6	PW	2021	Soybeans	GroupA-0335	3.06	0.08	2.56	0.08	3135.13	69.58	246	246	0	SR
AM	PW	2021	Soybeans	GroupA-0336	0.93	0.02	0.68	0.62	4299.79	21.26	1730	246	1484	SR
CF	PW	2021	Soybeans	GroupA-0337	0.79	0.00	0.64	0.37	1380.51	17.99	1090	246	844	SR
HB	PW	2021	Soybeans	GroupA-0338	1.35	0.01	1.12	0.13	2989.69	30.78	363	246	117	SR
PE	PW	2021	Soybeans	GroupA-0341	1.90	0.02	1.72	0.32	602.45	43.36	938	246	692	SR
PTB	PW	2021	Soybeans	GroupA-0342	4.01	0.05	3.43	0.10	3360.13	91.37	251	246	5	SR
PL	PW	2021	Soybeans	GroupA-0343	1.15	0.00	0.90	0.34	2757.07	26.10	978	246	732	SR
JL	PW	2021	Soybeans	GroupA-0345	3.72	0.02	3.45	0.08	31235.93	84.63	884	246	638	SR
AM	PTB	2013	Soybeans	GroupA-0348	0.85	0.00	0.73	0.51	1901.85	23.48	1748	289	1459	SR
HB	PTB	2013	Soybeans	GroupA-0349	1.05	0.01	0.88	0.23	1152.69	28.70	558	289	269	SR
BG	PTB	2013	Soybeans	GroupA-0351	0.74	0.10	0.59	0.71	5528.32	20.37	1438	289	1149	SR
BBEA	PTB	2013	Soybeans	GroupA-0352	1.20	0.02	1.09	1.87	5911.78	32.92	3081	289	2792	SR
BS	PTB	2013	Soybeans	GroupA-0355	2.29	0.06	2.07	0.06	2114.72	62.97	656	289	367	SR
AM	PTB	2014	Soybeans	GroupA-0357	1.26	0.07	1.07	0.49	1901.85	37.42	1748	299	1449	SR
HB	PTB	2014	Soybeans	GroupA-0358	2.17	0.02	1.19	0.23	1152.69	64.69	555	299	256	SR
PL	PTB	2014	Soybeans	GroupA-0360	1.66	0.02	1.33	0.38	2192.01	49.46	974	299	675	SR
PLB	PTB	2014	Soybeans	GroupA-0361	2.60	0.02	2.39	0.22	2652.61	77.55	500	299	201	SR
BG	PTB	2014	Soybeans	GroupA-0362	1.57	0.10	1.43	0.71	5528.32	46.82	1438	299	1139	SR
BBEA	PTB	2014	Soybeans	GroupA-0363	1.71	0.03	1.52	1.59	5911.78	50.97	3084	299	2785	SR
BS	PTB	2014	Soybeans	GroupA-0365	2.65	0.15	2.48	0.06	2114.72	78.86	656	299	357	SR
AM	PTB	2015	Soybeans	GroupA-0367	1.02	0.00	0.83	0.40	1901.85	57.89	1467	303	1164	SR
CF	PTB	2015	Soybeans	GroupA-0368	1.20	0.08	1.06	0.54	2125.67	68.28	1097	303	794	SR
HB	PTB	2015	Soybeans	GroupA-0369	0.78	0.03	0.63	0.22	1152.69	44.32	549	303	246	SR
PL	PTB	2015	Soybeans	GroupA-0371	1.24	0.04	0.96	0.38	2192.01	70.42	905	303	602	SR
BG	PTB	2015	Soybeans	GroupA-0373	1.16	0.05	1.01	0.75	5528.32	65.81	1384	303	1081	SR
BBEA	PTB	2015	Soybeans	GroupA-0374	1.18	0.04	1.02	1.46	5911.78	67.15	2811	303	2508	SR
BS	PTB	2015	Soybeans	GroupA-0375	0.95	0.01	0.76	0.06	2114.72	54.23	659	303	356	SR
CF	PTB	2016	Soybeans	GroupA-0376	0.97	0.04	0.80	0.52	2125.67	33.28	1083	297	786	SR
BS	PTB	2016	Soybeans	GroupA-0379	1.44	0.02	1.17	0.06	2114.72	49.58	655	297	358	SR
PE	PTB	2018	Soybeans	GroupA-0382	1.17	0.01	0.99	0.21	3583.16	29.15	941	289	652	SR
PW	PTB	2018	Soybeans	GroupA-0383	1.45	0.00	1.21	0.01	3360.13	36.27	257	289	-32	SR
BS	PTB	2018	Soybeans	GroupA-0384	2.05	0.07	1.78	0.07	2114.72	51.09	752	289	463	SR
BBEA	PTB	2020	Soybeans	GroupA-0399	1.81	0.04	1.69	1.59	5911.78	98.01	3036	262	2774	SR
AM	PTB	2021	Soybeans	GroupA-0402	1.83	0.01	1.54	0.48	1901.85	94.58	1730	251	1479	SR
PL	PTB	2021	Soybeans	GroupA-0409	1.80	0.02	1.48	0.39	2192.01	92.97	978	251	727	SR
CF	PL	2012	Soybeans	GroupA-0413	0.91	0.00	0.70	0.27	1531.30	25.28	1099	855	244	SR
PLB	PL	2012	Soybeans	GroupA-0415	0.72	0.11	0.56	0.25	809.82	20.04	502	855	-353	SR
CS	PL	2012	Soybeans	GroupA-0416	1.67	0.01	1.35	0.16	30903.15	46.40	1942	855	1087	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
6	PL	2014	Soybeans	GroupA-0418	3.30	0.01	2.25	0.02	632.74	83.36	250	974	-724	SR
AM	PL	2014	Soybeans	GroupA-0419	0.88	0.03	0.68	0.49	1797.09	22.19	1748	974	774	SR
HB	PL	2014	Soybeans	GroupA-0420	2.16	0.00	1.67	0.14	1056.49	54.49	555	974	-419	SR
PLB	PL	2014	Soybeans	GroupA-0423	1.23	0.00	0.94	0.25	809.82	30.95	500	974	-474	SR
BG	PL	2014	Soybeans	GroupA-0424	2.42	0.03	2.32	0.71	3360.23	61.12	1438	974	464	SR
BBEA	PL	2014	Soybeans	GroupA-0425	2.42	0.02	2.30	1.59	3759.77	61.06	3084	974	2110	SR
6	PL	2015	Soybeans	GroupA-0428	1.12	0.00	0.88	0.02	632.74	38.04	251	905	-654	SR
AM	PL	2015	Soybeans	GroupA-0429	1.17	0.00	0.93	0.43	1797.09	39.77	1467	905	562	SR
CF	PL	2015	Soybeans	GroupA-0430	1.34	0.02	0.77	0.51	1531.30	45.52	1097	905	192	SR
HB	PL	2015	Soybeans	GroupA-0431	1.64	0.07	1.41	0.26	1056.49	55.87	549	905	-356	SR
PLB	PL	2015	Soybeans	GroupA-0434	1.19	0.08	0.93	0.29	809.82	40.47	499	905	-406	SR
BG	PL	2015	Soybeans	GroupA-0435	2.12	0.03	2.00	0.70	3360.23	72.15	1384	905	479	SR
BBEA	PL	2015	Soybeans	GroupA-0436	2.06	0.05	1.94	1.46	3759.77	70.21	2811	905	1906	SR
AM	PL	2019	Soybeans	GroupA-0438	1.64	0.05	1.22	0.19	1797.09	50.94	745	968	-223	SR
CF	PL	2019	Soybeans	GroupA-0439	1.15	0.02	0.59	0.27	1531.30	35.55	1095	968	127	SR
PE	PL	2019	Soybeans	GroupA-0442	1.52	0.12	1.26	0.26	2576.96	47.24	942	968	-26	SR
PLB	PL	2019	Soybeans	GroupA-0445	0.73	0.16	0.58	0.25	809.82	22.54	502	968	-466	SR
6	PL	2021	Soybeans	GroupA-0447	4.53	0.05	3.71	0.02	632.74	98.30	246	978	-732	SR
AM	PL	2021	Soybeans	GroupA-0448	1.54	0.00	1.17	0.48	1797.09	33.39	1730	978	752	SR
CF	PL	2021	Soybeans	GroupA-0449	1.98	0.00	1.18	0.25	1531.30	42.94	1090	978	112	SR
HB	PL	2021	Soybeans	GroupA-0450	3.18	0.00	1.86	0.04	1056.49	68.97	363	978	-615	SR
PE	PL	2021	Soybeans	GroupA-0453	4.10	0.00	1.51	0.26	2576.96	88.86	938	978	-40	SR
BS	PL	2021	Soybeans	GroupA-0458	4.31	0.00	3.96	0.01	3972.53	93.54	85	978	-893	SR
CF	PLB	2012	Soybeans	GroupA-0459	0.71	0.01	0.57	0.27	1177.89	20.01	1099	502	597	SR
PL	PLB	2012	Soybeans	GroupA-0461	0.64	0.04	0.49	0.50	809.82	17.99	855	502	353	SR
CS	PLB	2012	Soybeans	GroupA-0462	2.00	0.00	1.57	0.16	31271.27	56.11	1942	502	1440	SR
AM	PLB	2014	Soybeans	GroupA-0465	1.01	0.04	0.82	0.49	2601.80	26.85	1748	500	1248	SR
HB	PLB	2014	Soybeans	GroupA-0466	2.30	0.02	1.72	0.13	1650.52	60.84	555	500	55	SR
PL	PLB	2014	Soybeans	GroupA-0469	1.04	0.00	0.77	0.51	809.82	27.55	974	500	474	SR
BG	PLB	2014	Soybeans	GroupA-0470	2.25	0.04	2.07	0.78	2941.78	59.68	1438	500	938	SR
BBEA	PLB	2014	Soybeans	GroupA-0471	2.37	0.06	2.21	1.60	3296.50	62.77	3084	500	2584	SR
BS	PLB	2014	Soybeans	GroupA-0473	2.38	0.04	2.04	0.05	4109.93	62.87	656	500	156	SR
6	PLB	2015	Soybeans	GroupA-0474	1.41	0.03	1.06	0.02	1403.96	62.18	251	499	-248	SR
AM	PLB	2015	Soybeans	GroupA-0475	0.77	0.08	0.64	0.40	2601.80	33.76	1467	499	968	SR
CF	PLB	2015	Soybeans	GroupA-0476	1.31	0.08	1.02	0.28	1177.89	57.42	1097	499	598	SR
HB	PLB	2015	Soybeans	GroupA-0477	1.29	0.11	1.09	0.14	1650.52	56.77	549	499	50	SR
PL	PLB	2015	Soybeans	GroupA-0480	1.41	0.06	1.08	0.25	809.82	61.89	905	499	406	SR
BG	PLB	2015	Soybeans	GroupA-0481	1.60	0.07	1.40	0.68	2941.78	70.25	1384	499	885	SR
BBEA	PLB	2015	Soybeans	GroupA-0482	1.45	0.07	1.26	1.46	3296.50	63.81	2811	499	2312	SR
BS	PLB	2015	Soybeans	GroupA-0483	0.88	0.04	0.70	0.05	4109.93	38.67	659	499	160	SR
AM	PLB	2019	Soybeans	GroupA-0484	1.43	0.03	1.06	0.18	2601.80	51.06	745	502	243	SR
CF	PLB	2019	Soybeans	GroupA-0485	1.28	0.03	0.97	0.25	1177.89	45.71	1095	502	593	SR
PE	PLB	2019	Soybeans	GroupA-0488	2.05	0.02	1.73	0.26	1832.05	73.02	942	502	440	SR
PL	PLB	2019	Soybeans	GroupA-0491	1.07	0.24	0.79	0.47	809.82	38.33	968	502	466	SR
AM	PLB	2021	Soybeans	GroupA-0494	1.45	0.06	1.13	0.51	2601.80	35.06	1730	491	1239	SR
CF	PLB	2021	Soybeans	GroupA-0495	1.51	0.02	1.12	0.27	1177.89	36.52	1090	491	599	SR
HB	PLB	2021	Soybeans	GroupA-0496	3.08	0.04	1.83	0.04	1650.52	74.53	363	491	-128	SR
PE	PLB	2021	Soybeans	GroupA-0499	1.82	0.00	1.37	0.28	1832.05	43.91	938	491	447	SR
PL	PLB	2021	Soybeans	GroupA-0502	1.53	0.05	1.02	0.47	809.82	36.88	978	491	487	SR
AM	BG	2013	Soybeans	GroupA-0506	1.52	0.13	1.21	0.11	4801.99	43.54	1748	1438	310	SR
HB	BG	2013	Soybeans	GroupA-0507	1.51	0.00	1.26	0.03	4415.29	43.15	558	1438	-880	SR
BBEA	BG	2013	Soybeans	GroupA-0510	1.31	0.24	1.13	1.74	438.12	37.69	3081	1438	1643	SR
BS	BG	2013	Soybeans	GroupA-0513	2.15	0.00	1.60	0.05	7029.70	61.66	656	1438	-782	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
BBEA	BG	2014	Soybeans	GroupA-0521	0.72	0.03	0.58	1.60	438.12	40.92	3084	1438	1646	SR
BBEA	BG	2015	Soybeans	GroupA-0532	0.53	0.11	0.44	1.45	438.12	65.57	2811	1384	1427	SR
AM	BG	2020	Soybeans	GroupA-0535	1.61	0.00	1.27	0.05	4801.99	42.93	991	1436	-445	SR
HB	BG	2020	Soybeans	GroupA-0536	1.30	0.03	1.02	0.03	4415.29	34.58	555	1436	-881	SR
BBEA	BG	2020	Soybeans	GroupA-0539	0.83	0.10	0.67	1.57	438.12	22.24	3036	1436	1600	SR
BS	BG	2020	Soybeans	GroupA-0540	2.49	0.00	2.14	0.05	7029.70	66.52	748	1436	-688	SR
AM	BBEA	2013	Soybeans	GroupA-0542	1.48	0.08	1.14	0.04	5233.55	53.58	1748	3081	-1333	SR
HB	BBEA	2013	Soybeans	GroupA-0543	1.27	0.00	1.01	0.02	4811.25	46.01	558	3081	-2523	SR
BG	BBEA	2013	Soybeans	GroupA-0546	1.26	0.11	0.97	0.04	438.12	45.72	1438	3081	-1643	SR
BS	BBEA	2013	Soybeans	GroupA-0549	2.66	0.00	1.31	0.02	7352.54	96.55	656	3081	-2425	SR
BG	BBEA	2014	Soybeans	GroupA-0557	0.80	0.01	0.66	0.05	438.12	44.16	1438	3084	-1646	SR
BG	BBEA	2015	Soybeans	GroupA-0568	0.56	0.17	0.44	0.07	438.12	74.13	1384	2811	-1427	SR
AM	BBEA	2020	Soybeans	GroupA-0571	1.89	0.02	1.41	0.02	5233.55	56.06	991	3036	-2045	SR
HB	BBEA	2020	Soybeans	GroupA-0572	1.46	0.01	1.15	0.02	4811.25	43.31	555	3036	-2481	SR
BG	BBEA	2020	Soybeans	GroupA-0575	1.04	0.03	0.74	0.04	438.12	30.72	1436	3036	-1600	SR
BS	BBEA	2020	Soybeans	GroupA-0576	2.71	0.01	2.29	0.02	7352.54	80.42	748	3036	-2288	SR
SP	CS	2020	Soybeans	GroupA-0586	1.06	0.04	0.87	0.47	2392.70	22.06	1984	2437	-453	SR
CF	JL	2019	Soybeans	GroupA-0590	1.41	0.00	1.21	0.07	30895.46	64.81	1095	888	207	SR
PE	JL	2019	Soybeans	GroupA-0593	2.15	0.06	2.06	0.06	31805.51	98.93	942	888	54	SR
PL	JL	2019	Soybeans	GroupA-0596	1.72	0.00	1.58	0.04	31562.14	78.94	968	888	80	SR
PLB	JL	2019	Soybeans	GroupA-0597	2.14	0.01	1.88	0.02	31878.96	98.29	502	888	-386	SR
6	JL	2021	Soybeans	GroupA-0598	4.05	0.00	3.46	0.02	31086.42	89.24	246	884	-638	SR
AM	JL	2021	Soybeans	GroupA-0599	1.62	0.05	1.41	0.10	30699.89	35.75	1730	884	846	SR
CF	JL	2021	Soybeans	GroupA-0600	1.28	0.00	0.98	0.07	30895.46	28.11	1090	884	206	SR
HB	JL	2021	Soybeans	GroupA-0601	2.95	0.09	2.64	0.02	30527.42	65.01	363	884	-521	SR
PE	JL	2021	Soybeans	GroupA-0604	2.86	0.03	2.71	0.06	31805.51	63.03	938	884	54	SR
PL	JL	2021	Soybeans	GroupA-0607	0.90	0.00	0.70	0.04	31562.14	19.85	978	884	94	SR
AA	SP	2014	Soybeans	GroupA-0612	1.04	0.00	0.80	0.61	3305.23	48.83	3968	1993	1975	SR
CS	SP	2020	Soybeans	GroupA-0614	0.89	0.01	0.66	0.17	2392.70	20.48	2437	1984	453	SR
AA	1P	2019	Soybeans	GroupA-0617	1.31	0.25	1.12	0.20	14966.67	37.63	3976	770	3206	SR
2PB	1P	2019	Soybeans	GroupA-0618	0.71	0.40	0.53	0.49	884.63	20.21	1767	770	997	SR
AA	1P	2021	Soybeans	GroupA-0619	0.78	0.00	0.53	0.19	14966.67	16.34	3966	770	3196	SR
2PB	1P	2021	Soybeans	GroupA-0620	0.90	0.06	0.77	0.50	884.63	18.88	1771	770	1001	SR
AA	2PB	2019	Soybeans	GroupA-0622	1.10	0.08	0.86	0.14	14577.73	30.16	3976	1767	2209	SR
AA	2PB	2021	Soybeans	GroupA-0624	1.05	0.00	0.82	0.14	14577.73	24.84	3966	1771	2195	SR
CS	MP	2020	Soybeans	GroupA-0627	0.74	0.26	0.54	0.35	10327.57	19.25	2437	954	1483	SR
SP	MP	2020	Soybeans	GroupA-0628	1.80	0.38	1.59	0.29	10398.84	46.81	1984	954	1030	SR
6	BS	2013	Soybeans	GroupA-0630	2.12	0.00	1.65	0.02	3688.53	66.65	249	656	-407	SR
AM	BS	2013	Soybeans	GroupA-0631	0.95	0.00	0.75	0.12	4011.02	29.72	1748	656	1092	SR
HB	BS	2013	Soybeans	GroupA-0632	1.64	0.00	1.44	0.03	3100.07	51.58	558	656	-98	SR
PTB	BS	2013	Soybeans	GroupA-0634	2.97	0.00	2.33	0.01	2114.72	93.36	289	656	-367	SR
BG	BS	2013	Soybeans	GroupA-0635	1.84	0.11	1.66	0.70	7029.70	57.69	1438	656	782	SR
BBEA	BS	2013	Soybeans	GroupA-0636	1.44	0.07	1.28	1.73	7352.54	45.13	3081	656	2425	SR
AM	BS	2014	Soybeans	GroupA-0640	1.80	0.00	1.48	0.12	4011.02	74.96	1748	656	1092	SR
HB	BS	2014	Soybeans	GroupA-0641	2.31	0.04	1.82	0.03	3100.07	95.93	555	656	-101	SR
PL	BS	2014	Soybeans	GroupA-0644	1.38	0.01	1.07	0.05	3972.53	57.40	974	656	318	SR
BG	BS	2014	Soybeans	GroupA-0646	1.45	0.00	1.28	0.76	7029.70	60.53	1438	656	782	SR
BBEA	BS	2014	Soybeans	GroupA-0647	1.30	0.03	1.14	1.59	7352.54	54.22	3084	656	2428	SR
AM	BS	2015	Soybeans	GroupA-0650	0.91	0.07	0.73	0.11	4011.02	66.10	1467	659	808	SR
PL	BS	2015	Soybeans	GroupA-0655	1.33	0.00	1.11	0.04	3972.53	96.34	905	659	246	SR
BG	BS	2015	Soybeans	GroupA-0657	0.90	0.00	0.75	0.74	7029.70	65.10	1384	659	725	SR
BBEA	BS	2015	Soybeans	GroupA-0658	0.73	0.02	0.61	1.58	7352.54	52.88	2811	659	2152	SR
CF	BS	2016	Soybeans	GroupA-0659	1.17	0.00	0.94	0.07	3076.95	46.39	1083	655	428	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PTB	BS	2016	Soybeans	GroupA-0662	2.50	0.02	1.94	0.02	2114.72	99.14	297	655	-358	SR
PE	BS	2018	Soybeans	GroupA-0665	1.25	0.00	0.92	0.06	4129.23	32.94	941	752	189	SR
AM	BS	2020	Soybeans	GroupA-0669	1.37	0.05	1.02	0.05	4011.02	40.28	991	748	243	SR
HB	BS	2020	Soybeans	GroupA-0670	0.81	0.24	0.65	0.03	3100.07	23.74	555	748	-193	SR
BG	BS	2020	Soybeans	GroupA-0673	0.95	0.00	0.72	0.77	7029.70	28.08	1436	748	688	SR
BBEA	BS	2020	Soybeans	GroupA-0674	0.99	0.01	0.83	1.59	7352.54	29.02	3036	748	2288	SR
AA	RD	2014	Soybeans	GroupA-0688	4.08	0.02	2.47	0.33	28035.93	89.45	3968	1259	2709	SR
CS	RD	2020	Soybeans	GroupA-0689	3.33	0.08	3.21	0.15	28340.32	91.51	2437	1254	1183	SR
SP	RD	2020	Soybeans	GroupA-0690	1.50	0.01	1.13	0.12	30697.43	41.26	1984	1254	730	SR
AA	RD	2021	Soybeans	GroupA-0692	1.53	0.00	1.11	0.32	28035.93	40.10	3966	1259	2707	SR
AM	6	2016	Corn	GroupA-0695	1.13	0.04	0.87	0.97	1216.49	12.50	1759	249	1510	SR
HB	6	2016	Corn	GroupA-0696	1.32	0.00	1.01	0.18	593.20	14.66	366	249	117	SR
NH	6	2016	Corn	GroupA-0697	2.96	0.08	2.53	0.01	2271.12	32.85	222	249	-27	SR
PL	6	2016	Corn	GroupA-0698	1.17	0.00	0.95	0.52	632.74	12.97	978	249	729	SR
PLB	6	2016	Corn	GroupA-0699	1.84	0.02	1.44	0.26	1403.96	20.40	501	249	252	SR
BG	6	2016	Corn	GroupA-0700	1.30	0.00	1.08	0.70	3938.74	14.45	1426	249	1177	SR
BBEA	6	2016	Corn	GroupA-0701	1.09	0.11	0.84	1.56	4348.89	12.03	3066	249	2817	SR
AM	6	2017	Corn	GroupA-0702	2.31	0.03	1.97	0.88	1216.49	19.15	1746	248	1498	SR
CF	6	2017	Corn	GroupA-0703	3.25	0.12	2.69	0.52	1790.97	26.87	1099	248	851	SR
HB	6	2017	Corn	GroupA-0704	4.38	0.01	3.82	0.27	593.20	36.26	557	248	309	SR
NH	6	2017	Corn	GroupA-0705	6.90	0.00	5.71	0.01	2271.12	57.11	226	248	-22	SR
PTB	6	2017	Corn	GroupA-0707	5.61	0.04	4.54	0.15	1728.12	46.39	296	248	48	SR
PL	6	2017	Corn	GroupA-0708	2.77	0.24	2.35	0.47	632.74	22.93	979	248	731	SR
PLB	6	2017	Corn	GroupA-0709	2.66	0.02	2.17	0.25	1403.96	22.04	508	248	260	SR
BG	6	2017	Corn	GroupA-0710	3.14	0.08	2.66	0.69	3938.74	25.96	1426	248	1178	SR
BBEA	6	2017	Corn	GroupA-0711	2.96	0.02	2.51	1.49	4348.89	24.51	2889	248	2641	SR
BS	6	2017	Corn	GroupA-0713	7.70	0.02	4.21	0.36	3688.53	63.72	757	248	509	SR
AM	6	2018	Corn	GroupA-0714	2.48	0.00	2.01	0.91	1216.49	31.42	1727	244	1483	SR
CF	6	2018	Corn	GroupA-0715	3.81	0.02	2.84	0.52	1790.97	48.34	1098	244	854	SR
HB	6	2018	Corn	GroupA-0716	5.20	0.03	4.64	0.18	593.20	65.98	363	244	119	SR
PL	6	2018	Corn	GroupA-0718	2.79	0.00	2.17	0.49	632.74	35.36	974	244	730	SR
PLB	6	2018	Corn	GroupA-0719	3.61	0.00	2.74	0.26	1403.96	45.82	506	244	262	SR
BG	6	2018	Corn	GroupA-0720	2.51	0.00	2.05	0.81	3938.74	31.78	1421	244	1177	SR
BBEA	6	2018	Corn	GroupA-0721	2.39	0.00	2.03	1.58	4348.89	30.35	3047	244	2803	SR
AM	6	2019	Corn	GroupA-0723	0.98	0.28	0.74	0.48	1216.49	14.81	992	246	746	SR
HB	6	2019	Corn	GroupA-0724	2.48	0.07	2.01	0.18	593.20	37.56	365	246	119	SR
NH	6	2019	Corn	GroupA-0725	6.40	0.00	5.12	0.01	2271.12	96.77	215	246	-31	SR
BG	6	2019	Corn	GroupA-0726	1.91	0.02	1.63	0.70	3938.74	28.89	1428	246	1182	SR
BBEA	6	2019	Corn	GroupA-0727	1.70	0.08	1.41	1.72	4348.89	25.65	3067	246	2821	SR
BS	6	2019	Corn	GroupA-0728	4.88	0.00	4.29	0.40	3688.53	73.86	749	246	503	SR
NH	AM	2015	Corn	GroupA-0729	6.26	0.16	4.72	0.01	1283.59	87.62	221	276	-55	SR
6	AM	2016	Corn	GroupA-0731	6.46	0.00	4.66	0.02	1216.49	73.04	249	1759	-1510	SR
HB	AM	2016	Corn	GroupA-0732	8.26	0.01	2.95	0.02	1351.32	93.48	366	1759	-1393	SR
NH	AM	2016	Corn	GroupA-0733	2.61	0.00	2.17	0.01	1283.59	29.47	222	1759	-1537	SR
PL	AM	2016	Corn	GroupA-0734	1.22	0.00	0.94	0.07	1797.09	13.78	978	1759	-781	SR
PLB	AM	2016	Corn	GroupA-0735	3.77	0.01	3.30	0.04	2601.80	42.70	501	1759	-1258	SR
BG	AM	2016	Corn	GroupA-0736	1.42	0.01	0.96	0.13	4801.99	16.12	1426	1759	-333	SR
BBEA	AM	2016	Corn	GroupA-0737	1.20	0.00	0.82	0.28	5233.55	13.53	3066	1759	1307	SR
6	AM	2017	Corn	GroupA-0738	4.88	0.02	3.88	0.02	1216.49	40.51	248	1746	-1498	SR
CF	AM	2017	Corn	GroupA-0739	2.94	0.02	2.36	0.09	2925.31	24.38	1099	1746	-647	SR
HB	AM	2017	Corn	GroupA-0740	4.03	0.00	3.24	0.03	1351.32	33.47	557	1746	-1189	SR
NH	AM	2017	Corn	GroupA-0741	7.63	0.01	6.04	0.01	1283.59	63.36	226	1746	-1520	SR
PTB	AM	2017	Corn	GroupA-0743	6.05	0.05	4.96	0.02	1901.85	50.25	296	1746	-1450	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PL	AM	2017	Corn	GroupA-0744	4.41	0.04	3.78	0.07	1797.09	36.58	979	1746	-767	SR
PLB	AM	2017	Corn	GroupA-0745	6.02	0.00	5.44	0.04	2601.80	49.97	508	1746	-1238	SR
BG	AM	2017	Corn	GroupA-0746	2.96	0.01	2.54	0.13	4801.99	24.60	1426	1746	-320	SR
BBEA	AM	2017	Corn	GroupA-0747	2.79	0.03	2.41	0.27	5233.55	23.16	2889	1746	1143	SR
BS	AM	2017	Corn	GroupA-0749	4.22	0.01	3.43	0.06	4011.02	35.05	757	1746	-989	SR
6	AM	2018	Corn	GroupA-0750	5.77	0.02	4.26	0.02	1216.49	72.65	244	1727	-1483	SR
CF	AM	2018	Corn	GroupA-0751	3.20	0.01	2.51	0.08	2925.31	40.24	1098	1727	-629	SR
PL	AM	2018	Corn	GroupA-0754	3.03	0.02	2.43	0.07	1797.09	38.11	974	1727	-753	SR
PLB	AM	2018	Corn	GroupA-0755	6.49	0.05	5.49	0.04	2601.80	81.69	506	1727	-1221	SR
BG	AM	2018	Corn	GroupA-0756	2.40	0.05	1.83	0.14	4801.99	30.28	1421	1727	-306	SR
BBEA	AM	2018	Corn	GroupA-0757	2.26	0.00	1.86	0.28	5233.55	28.42	3047	1727	1320	SR
6	AM	2019	Corn	GroupA-0759	2.83	0.05	2.11	0.02	1216.49	44.54	246	992	-746	SR
HB	AM	2019	Corn	GroupA-0760	3.13	0.00	2.46	0.02	1351.32	49.40	365	992	-627	SR
BG	AM	2019	Corn	GroupA-0762	2.88	0.02	2.60	0.13	4801.99	45.41	1428	992	436	SR
BBEA	AM	2019	Corn	GroupA-0763	1.67	0.12	1.38	0.29	5233.55	26.30	3067	992	2075	SR
CF	AM	2020	Corn	GroupA-0765	2.65	0.06	2.35	0.16	2925.31	34.31	1095	742	353	SR
PE	AM	2020	Corn	GroupA-0767	6.13	0.07	5.56	0.11	4256.93	79.21	942	742	200	SR
PL	AM	2020	Corn	GroupA-0769	2.54	0.01	2.04	0.12	1797.09	32.83	976	742	234	SR
PLB	AM	2020	Corn	GroupA-0770	5.10	0.08	4.18	0.07	2601.80	65.97	498	742	-244	SR
JL	AM	2020	Corn	GroupA-0771	2.53	0.00	1.95	0.06	30699.89	32.71	889	742	147	SR
PL	CF	2013	Corn	GroupA-0773	1.96	0.01	1.50	0.38	1531.30	22.00	972	1093	-121	SR
PLB	CF	2013	Corn	GroupA-0774	3.48	0.02	2.71	0.20	1177.89	39.05	503	1093	-590	SR
NH	CF	2014	Corn	GroupA-0775	4.98	0.01	4.01	0.01	4061.52	41.23	223	1086	-863	SR
6	CF	2017	Corn	GroupA-0776	6.46	0.04	4.86	0.02	1790.97	59.03	248	1099	-851	SR
AM	CF	2017	Corn	GroupA-0777	2.28	0.01	1.61	0.47	2925.31	20.87	1746	1099	647	SR
HB	CF	2017	Corn	GroupA-0778	4.52	0.03	3.73	0.22	1609.48	41.33	557	1099	-542	SR
PTB	CF	2017	Corn	GroupA-0781	4.70	0.00	3.79	0.13	2125.67	42.96	296	1099	-803	SR
PL	CF	2017	Corn	GroupA-0782	2.68	0.02	2.05	0.39	1531.30	24.47	979	1099	-120	SR
PLB	CF	2017	Corn	GroupA-0783	3.45	0.00	2.45	0.21	1177.89	31.58	508	1099	-591	SR
BG	CF	2017	Corn	GroupA-0784	2.17	0.00	1.62	0.70	3976.07	19.87	1426	1099	327	SR
BBEA	CF	2017	Corn	GroupA-0785	2.18	0.02	1.63	1.48	4282.54	19.94	2889	1099	1790	SR
BS	CF	2017	Corn	GroupA-0787	5.10	0.01	4.26	0.07	3076.95	46.61	757	1099	-342	SR
6	CF	2018	Corn	GroupA-0788	6.31	0.02	4.91	0.02	1790.97	84.75	244	1098	-854	SR
AM	CF	2018	Corn	GroupA-0789	2.45	0.00	1.92	0.48	2925.31	32.93	1727	1098	629	SR
PL	CF	2018	Corn	GroupA-0792	2.60	0.00	2.01	0.41	1531.30	34.89	974	1098	-124	SR
PLB	CF	2018	Corn	GroupA-0793	2.96	0.04	2.33	0.23	1177.89	39.79	506	1098	-592	SR
BG	CF	2018	Corn	GroupA-0794	2.46	0.00	1.92	0.82	3976.07	32.99	1421	1098	323	SR
BBEA	CF	2018	Corn	GroupA-0795	2.25	0.00	1.74	1.58	4282.54	30.26	3047	1098	1949	SR
AM	CF	2020	Corn	GroupA-0797	1.90	0.00	1.48	0.20	2925.31	22.61	742	1095	-353	SR
PE	CF	2020	Corn	GroupA-0799	3.65	0.03	3.06	0.20	1470.34	43.49	942	1095	-153	SR
PL	CF	2020	Corn	GroupA-0801	2.74	0.03	2.03	0.42	1531.30	32.67	976	1095	-119	SR
PLB	CF	2020	Corn	GroupA-0802	3.48	0.06	2.74	0.24	1177.89	41.41	498	1095	-597	SR
JL	CF	2020	Corn	GroupA-0803	4.26	0.06	3.44	0.06	30895.46	50.64	889	1095	-206	SR
6	HB	2016	Corn	GroupA-0804	2.40	0.04	1.51	0.02	593.20	26.22	249	366	-117	SR
AM	HB	2016	Corn	GroupA-0805	0.99	0.00	0.81	0.91	1351.32	10.78	1759	366	1393	SR
NH	HB	2016	Corn	GroupA-0806	2.08	0.02	1.80	0.01	2580.18	22.70	222	366	-144	SR
PL	HB	2016	Corn	GroupA-0807	1.06	0.00	0.83	0.48	1056.49	11.62	978	366	612	SR
PLB	HB	2016	Corn	GroupA-0808	1.51	0.01	1.24	0.25	1650.52	16.46	501	366	135	SR
BG	HB	2016	Corn	GroupA-0809	1.20	0.00	0.99	0.71	4415.29	13.12	1426	366	1060	SR
BBEA	HB	2016	Corn	GroupA-0810	1.17	0.00	0.97	1.56	4811.25	12.77	3066	366	2700	SR
6	HB	2017	Corn	GroupA-0811	8.33	0.18	6.41	0.02	593.20	88.32	248	557	-309	SR
AM	HB	2017	Corn	GroupA-0812	3.42	0.06	2.68	0.47	1351.32	36.28	1746	557	1189	SR
CF	HB	2017	Corn	GroupA-0813	3.73	0.19	2.89	0.52	1609.48	39.53	1099	557	542	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
NH	HB	2017	Corn	GroupA-0814	7.79	0.05	6.49	0.01	2580.18	82.60	226	557	-331	SR
PTB	HB	2017	Corn	GroupA-0816	4.67	0.02	3.69	0.16	1152.69	49.50	296	557	-261	SR
PL	HB	2017	Corn	GroupA-0817	3.92	0.23	3.22	0.47	1056.49	41.62	979	557	422	SR
PLB	HB	2017	Corn	GroupA-0818	5.39	0.10	4.22	0.25	1650.52	57.14	508	557	-49	SR
BG	HB	2017	Corn	GroupA-0819	3.37	0.06	2.59	0.70	4415.29	35.70	1426	557	869	SR
BBEA	HB	2017	Corn	GroupA-0820	3.78	0.03	2.89	1.48	4811.25	40.09	2889	557	2332	SR
BS	HB	2017	Corn	GroupA-0822	3.91	0.01	3.24	0.07	3100.07	41.45	757	557	200	SR
6	HB	2018	Corn	GroupA-0823	5.26	0.11	4.37	0.02	593.20	92.56	244	363	-119	SR
AM	HB	2018	Corn	GroupA-0824	3.14	0.00	2.71	0.87	1351.32	55.24	1727	363	1364	SR
CF	HB	2018	Corn	GroupA-0825	4.99	0.04	4.36	0.53	1609.48	87.67	1098	363	735	SR
PL	HB	2018	Corn	GroupA-0827	4.04	0.22	3.48	0.47	1056.49	71.10	974	363	611	SR
BG	HB	2018	Corn	GroupA-0829	3.43	0.21	2.90	0.88	4415.29	60.39	1421	363	1058	SR
BBEA	HB	2018	Corn	GroupA-0830	3.20	0.11	2.73	1.58	4811.25	56.23	3047	363	2684	SR
6	HB	2019	Corn	GroupA-0832	3.17	0.07	2.50	0.02	593.20	51.90	246	365	-119	SR
AM	HB	2019	Corn	GroupA-0833	2.06	0.12	1.62	0.49	1351.32	33.75	992	365	627	SR
BG	HB	2019	Corn	GroupA-0835	2.97	0.00	2.46	0.70	4415.29	48.59	1428	365	1063	SR
BBEA	HB	2019	Corn	GroupA-0836	2.59	0.00	2.06	1.59	4811.25	42.44	3067	365	2702	SR
CF	NH	2014	Corn	GroupA-0838	2.49	0.01	1.97	0.16	4061.52	23.96	1086	223	863	SR
AM	NH	2015	Corn	GroupA-0839	2.63	0.14	2.18	0.07	1283.59	37.57	276	221	55	SR
6	NH	2016	Corn	GroupA-0841	7.66	0.15	7.09	0.03	2271.12	99.84	249	222	27	SR
AM	NH	2016	Corn	GroupA-0842	1.38	0.00	1.14	0.91	1283.59	17.98	1759	222	1537	SR
HB	NH	2016	Corn	GroupA-0843	3.49	0.14	2.75	0.05	2580.18	45.45	366	222	144	SR
PL	NH	2016	Corn	GroupA-0844	1.08	0.00	0.85	0.15	2690.61	14.02	978	222	756	SR
PLB	NH	2016	Corn	GroupA-0845	3.04	0.14	2.82	0.08	3474.91	39.70	501	222	279	SR
BG	NH	2016	Corn	GroupA-0846	1.96	0.16	1.79	0.21	4995.12	25.61	1426	222	1204	SR
BBEA	NH	2016	Corn	GroupA-0847	1.26	0.00	1.02	0.46	5431.98	16.41	3066	222	2844	SR
6	NH	2017	Corn	GroupA-0848	5.17	0.00	3.76	0.03	2271.12	50.02	248	226	22	SR
AM	NH	2017	Corn	GroupA-0849	3.35	0.00	2.70	0.87	1283.59	32.37	1746	226	1520	SR
CF	NH	2017	Corn	GroupA-0850	4.32	0.10	3.46	0.17	4061.52	41.75	1099	226	873	SR
HB	NH	2017	Corn	GroupA-0851	3.57	0.13	2.90	0.09	2580.18	34.48	557	226	331	SR
PTB	NH	2017	Corn	GroupA-0853	8.77	0.03	8.33	0.05	3164.44	84.81	296	226	70	SR
PL	NH	2017	Corn	GroupA-0854	2.58	0.03	2.18	0.15	2690.61	24.92	979	226	753	SR
PLB	NH	2017	Corn	GroupA-0855	5.60	0.00	4.77	0.08	3474.91	54.12	508	226	282	SR
BG	NH	2017	Corn	GroupA-0856	2.51	0.01	2.15	0.21	4995.12	24.31	1426	226	1200	SR
BBEA	NH	2017	Corn	GroupA-0857	2.00	0.01	1.58	0.44	5431.98	19.35	2889	226	2663	SR
JL	NH	2017	Corn	GroupA-0858	6.00	0.06	5.28	0.15	31398.77	58.05	862	226	636	SR
6	NH	2018	Corn	GroupA-0860	4.62	0.01	3.73	0.03	2271.12	73.72	244	222	22	SR
AM	NH	2018	Corn	GroupA-0861	3.66	0.03	3.14	0.87	1283.59	58.31	1727	222	1505	SR
CF	NH	2018	Corn	GroupA-0862	4.21	0.02	3.33	0.16	4061.52	67.07	1098	222	876	SR
PL	NH	2018	Corn	GroupA-0864	3.07	0.12	2.49	0.14	2690.61	48.88	974	222	752	SR
BG	NH	2018	Corn	GroupA-0866	3.91	0.02	3.38	0.23	4995.12	62.28	1421	222	1199	SR
BBEA	NH	2018	Corn	GroupA-0867	2.41	0.01	1.74	0.46	5431.98	38.44	3047	222	2825	SR
JL	NH	2018	Corn	GroupA-0868	5.45	0.03	4.45	0.14	31398.77	86.86	901	222	679	SR
AM	NH	2019	Corn	GroupA-0870	2.45	0.04	2.17	0.29	1283.59	32.56	992	215	777	SR
BG	NH	2019	Corn	GroupA-0872	2.78	0.08	2.20	0.21	4995.12	36.96	1428	215	1213	SR
BBEA	NH	2019	Corn	GroupA-0873	1.72	0.07	1.32	0.46	5431.98	22.88	3067	215	2852	SR
BS	NH	2019	Corn	GroupA-0874	6.57	0.29	5.92	0.11	5253.94	87.43	749	215	534	SR
CF	PB	2013	Corn	GroupA-0875	3.26	0.08	2.59	0.17	1477.63	29.68	1093	327	766	SR
PL	PB	2013	Corn	GroupA-0876	2.91	0.06	1.61	0.29	2233.71	26.47	972	327	645	SR
PLB	PB	2013	Corn	GroupA-0877	1.99	0.29	1.50	0.15	1437.03	18.08	503	327	176	SR
6	PB	2017	Corn	GroupA-0878	12.75	0.01	5.26	0.01	2775.62	97.68	248	338	-90	SR
AM	PB	2017	Corn	GroupA-0879	3.76	0.02	2.10	0.08	3991.90	28.84	1746	338	1408	SR
CF	PB	2017	Corn	GroupA-0880	2.31	0.02	1.78	0.04	1477.63	17.68	1099	338	761	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
HB	PB	2017	Corn	GroupA-0881	2.84	0.04	2.21	0.02	2853.21	21.77	557	338	219	SR
PL	PB	2017	Corn	GroupA-0884	3.42	0.07	2.84	0.03	2233.71	26.23	979	338	641	SR
PLB	PB	2017	Corn	GroupA-0885	2.99	0.01	1.82	0.02	1437.03	22.88	508	338	170	SR
BG	PB	2017	Corn	GroupA-0886	7.03	0.05	6.58	0.08	3001.92	53.84	1426	338	1088	SR
BBEA	PB	2017	Corn	GroupA-0887	5.75	0.00	5.34	0.15	3203.03	44.04	2889	338	2551	SR
BS	PB	2017	Corn	GroupA-0889	9.04	0.04	8.68	0.03	4411.96	69.29	757	338	419	SR
AM	PB	2020	Corn	GroupA-0890	3.38	0.00	2.55	0.03	3991.90	30.88	742	333	409	SR
CF	PB	2020	Corn	GroupA-0891	2.62	0.10	2.27	0.04	1477.63	23.91	1095	333	762	SR
PE	PB	2020	Corn	GroupA-0892	2.00	0.00	1.59	0.26	573.60	18.27	942	333	609	SR
PL	PB	2020	Corn	GroupA-0894	3.59	0.01	1.82	0.03	2233.71	32.77	976	333	643	SR
PLB	PB	2020	Corn	GroupA-0895	4.29	0.00	3.63	0.02	1437.03	39.18	498	333	165	SR
JL	PB	2020	Corn	GroupA-0896	9.12	0.04	8.77	0.04	32178.80	83.36	889	333	556	SR
AM	PE	2020	Corn	GroupA-0897	3.57	0.01	2.57	0.05	4256.93	30.67	742	942	-200	SR
CF	PE	2020	Corn	GroupA-0898	4.30	0.01	3.84	0.08	1470.34	36.90	1095	942	153	SR
PB	PE	2020	Corn	GroupA-0899	6.60	0.01	5.10	0.02	573.60	56.68	333	942	-609	SR
PL	PE	2020	Corn	GroupA-0901	1.87	0.03	1.52	0.05	2576.96	16.10	976	942	34	SR
PLB	PE	2020	Corn	GroupA-0902	4.52	0.06	3.63	0.03	1832.05	38.84	498	942	-444	SR
JL	PE	2020	Corn	GroupA-0903	7.37	0.00	6.10	0.05	31805.51	63.27	889	942	-53	SR
AM	PW	2020	Corn	GroupA-0904	2.07	0.03	1.67	0.26	4299.79	19.94	742	260	482	SR
CF	PW	2020	Corn	GroupA-0905	2.37	0.00	2.03	0.37	1380.51	22.83	1095	260	835	SR
PE	PW	2020	Corn	GroupA-0907	2.04	0.00	1.64	0.33	602.45	19.69	942	260	682	SR
PL	PW	2020	Corn	GroupA-0908	2.50	0.06	1.75	0.34	2757.07	24.15	976	260	716	SR
PLB	PW	2020	Corn	GroupA-0909	5.99	0.01	5.60	0.21	2110.84	57.79	498	260	238	SR
JL	PW	2020	Corn	GroupA-0910	8.17	0.02	7.85	0.05	31235.93	78.77	889	260	629	SR
AM	PTB	2017	Corn	GroupA-0912	5.70	0.01	5.14	0.47	1901.85	95.82	1746	296	1450	SR
CF	PTB	2017	Corn	GroupA-0913	5.29	0.32	4.24	0.52	2125.67	88.91	1099	296	803	SR
PL	PTB	2017	Corn	GroupA-0917	5.53	0.03	4.89	0.39	2192.01	93.03	979	296	683	SR
BG	PTB	2017	Corn	GroupA-0919	4.05	0.09	3.48	0.72	5528.32	68.05	1426	296	1130	SR
BBEA	PTB	2017	Corn	GroupA-0920	4.66	0.30	4.27	1.60	5911.78	78.35	2889	296	2593	SR
BS	PTB	2017	Corn	GroupA-0922	3.32	0.05	2.52	0.07	2114.72	55.83	757	296	461	SR
CF	PL	2013	Corn	GroupA-0923	3.08	0.01	2.31	0.25	1531.30	30.39	1093	972	121	SR
PLB	PL	2013	Corn	GroupA-0925	1.58	0.00	1.18	0.25	809.82	15.54	503	972	-469	SR
AM	PL	2015	Corn	GroupA-0926	2.64	0.14	2.42	0.13	1797.09	33.20	276	55	221	SR
NH	PL	2015	Corn	GroupA-0927	2.07	0.26	1.64	0.03	2690.61	26.02	221	55	166	SR
6	PL	2016	Corn	GroupA-0928	4.48	0.02	2.66	0.02	632.74	50.93	249	978	-729	SR
AM	PL	2016	Corn	GroupA-0929	1.00	0.02	0.77	0.50	1797.09	11.39	1759	978	781	SR
HB	PL	2016	Corn	GroupA-0930	7.31	0.00	2.75	0.04	1056.49	83.09	366	978	-612	SR
NH	PL	2016	Corn	GroupA-0931	2.87	0.02	2.54	0.01	2690.61	32.62	222	978	-756	SR
PLB	PL	2016	Corn	GroupA-0932	1.41	0.01	1.04	0.25	809.82	16.03	501	978	-477	SR
BG	PL	2016	Corn	GroupA-0933	1.62	0.02	1.23	0.70	3360.23	18.42	1426	978	448	SR
BBEA	PL	2016	Corn	GroupA-0934	1.35	0.01	1.06	1.59	3759.77	15.32	3066	978	2088	SR
6	PL	2017	Corn	GroupA-0935	7.34	0.04	6.09	0.02	632.74	70.59	248	979	-731	SR
AM	PL	2017	Corn	GroupA-0936	3.42	0.04	2.34	0.48	1797.09	32.85	1746	979	767	SR
CF	PL	2017	Corn	GroupA-0937	3.23	0.02	2.50	0.27	1531.30	31.09	1099	979	120	SR
HB	PL	2017	Corn	GroupA-0938	3.84	0.00	2.98	0.15	1056.49	36.92	557	979	-422	SR
NH	PL	2017	Corn	GroupA-0939	9.23	0.00	6.11	0.01	2690.61	88.78	226	979	-753	SR
PTB	PL	2017	Corn	GroupA-0941	7.05	0.00	6.37	0.08	2192.01	67.75	296	979	-683	SR
PLB	PL	2017	Corn	GroupA-0942	2.82	0.01	2.11	0.25	809.82	27.11	508	979	-471	SR
BG	PL	2017	Corn	GroupA-0943	2.51	0.06	1.87	0.69	3360.23	24.10	1426	979	447	SR
BBEA	PL	2017	Corn	GroupA-0944	2.19	0.00	1.67	1.49	3759.77	21.08	2889	979	1910	SR
6	PL	2018	Corn	GroupA-0947	6.28	0.01	4.22	0.02	632.74	92.22	244	974	-730	SR
AM	PL	2018	Corn	GroupA-0948	3.50	0.00	2.49	0.48	1797.09	51.33	1727	974	753	SR
CF	PL	2018	Corn	GroupA-0949	4.58	0.00	2.86	0.25	1531.30	67.19	1098	974	124	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PLB	PL	2018	Corn	GroupA-0952	4.63	0.02	2.95	0.28	809.82	67.95	506	974	-468	SR
BG	PL	2018	Corn	GroupA-0953	2.54	0.02	2.00	0.81	3360.23	37.28	1421	974	447	SR
BBEA	PL	2018	Corn	GroupA-0954	2.30	0.02	1.91	1.58	3759.77	33.79	3047	974	2073	SR
AM	PL	2020	Corn	GroupA-0956	3.86	0.01	2.04	0.18	1797.09	42.02	742	976	-234	SR
CF	PL	2020	Corn	GroupA-0957	2.46	0.01	1.66	0.25	1531.30	26.82	1095	976	119	SR
PE	PL	2020	Corn	GroupA-0959	6.49	0.02	4.20	0.26	2576.96	70.65	942	976	-34	SR
PLB	PL	2020	Corn	GroupA-0961	1.90	0.00	1.53	0.30	809.82	20.66	498	976	-478	SR
JL	PL	2020	Corn	GroupA-0962	5.80	0.04	3.39	0.07	31562.14	63.14	889	976	-87	SR
CF	PLB	2013	Corn	GroupA-0963	1.90	0.00	1.59	0.28	1177.89	19.32	1093	503	590	SR
PL	PLB	2013	Corn	GroupA-0965	1.47	0.00	1.09	0.46	809.82	14.94	972	503	469	SR
6	PLB	2016	Corn	GroupA-0966	4.90	0.17	3.63	0.02	1403.96	59.02	249	501	-252	SR
AM	PLB	2016	Corn	GroupA-0967	1.12	0.06	0.89	0.50	2601.80	13.50	1759	501	1258	SR
HB	PLB	2016	Corn	GroupA-0968	7.52	0.02	3.50	0.04	1650.52	90.55	366	501	-135	SR
NH	PLB	2016	Corn	GroupA-0969	3.67	0.00	3.36	0.01	3474.91	44.17	222	501	-279	SR
PL	PLB	2016	Corn	GroupA-0970	1.04	0.15	0.78	0.48	809.82	12.47	978	501	477	SR
BG	PLB	2016	Corn	GroupA-0971	1.52	0.00	1.16	0.77	2941.78	18.25	1426	501	925	SR
BBEA	PLB	2016	Corn	GroupA-0972	1.34	0.00	1.10	1.56	3296.50	16.18	3066	501	2565	SR
AM	PLB	2017	Corn	GroupA-0974	3.51	0.00	2.80	0.47	2601.80	36.63	1746	508	1238	SR
CF	PLB	2017	Corn	GroupA-0975	2.68	0.01	2.17	0.25	1177.89	27.99	1099	508	591	SR
HB	PLB	2017	Corn	GroupA-0976	3.55	0.02	3.00	0.13	1650.52	37.05	557	508	49	SR
PTB	PLB	2017	Corn	GroupA-0979	9.19	0.00	8.65	0.08	2652.61	95.94	296	508	-212	SR
PL	PLB	2017	Corn	GroupA-0980	2.21	0.02	1.70	0.48	809.82	23.11	979	508	471	SR
BG	PLB	2017	Corn	GroupA-0981	2.46	0.00	1.94	0.70	2941.78	25.67	1426	508	918	SR
BBEA	PLB	2017	Corn	GroupA-0982	2.29	0.00	1.84	1.49	3296.50	23.92	2889	508	2381	SR
BS	PLB	2017	Corn	GroupA-0984	3.89	0.00	2.92	0.05	4109.93	40.61	757	508	249	SR
AM	PLB	2018	Corn	GroupA-0986	4.20	0.04	3.43	0.48	2601.80	74.98	1727	506	1221	SR
CF	PLB	2018	Corn	GroupA-0987	2.86	0.05	2.24	0.25	1177.89	51.10	1098	506	592	SR
PL	PLB	2018	Corn	GroupA-0990	3.01	0.01	2.44	0.46	809.82	53.62	974	506	468	SR
BG	PLB	2018	Corn	GroupA-0991	2.89	0.02	2.33	0.81	2941.78	51.57	1421	506	915	SR
BBEA	PLB	2018	Corn	GroupA-0992	2.68	0.02	2.21	1.70	3296.50	47.83	3047	506	2541	SR
AM	PLB	2020	Corn	GroupA-0994	2.24	0.03	1.82	0.18	2601.80	24.17	742	498	244	SR
CF	PLB	2020	Corn	GroupA-0995	2.00	0.00	1.47	0.25	1177.89	21.60	1095	498	597	SR
PE	PLB	2020	Corn	GroupA-0997	5.21	0.01	4.63	0.28	1832.05	56.19	942	498	444	SR
PL	PLB	2020	Corn	GroupA-0999	2.33	0.00	1.87	0.49	809.82	25.09	976	498	478	SR
JL	PLB	2020	Corn	GroupA-1000	4.77	0.00	4.07	0.07	31878.96	51.35	889	498	391	SR
6	BG	2016	Corn	GroupA-1001	5.36	0.02	4.25	0.02	3938.74	62.12	249	1426	-1177	SR
AM	BG	2016	Corn	GroupA-1002	1.91	0.04	1.46	0.12	4801.99	22.13	1759	1426	333	SR
HB	BG	2016	Corn	GroupA-1003	6.31	0.01	4.35	0.02	4415.29	73.13	366	1426	-1060	SR
NH	BG	2016	Corn	GroupA-1004	5.25	0.00	4.58	0.01	4995.12	60.88	222	1426	-1204	SR
PL	BG	2016	Corn	GroupA-1005	2.18	0.00	1.75	0.05	3360.23	25.27	978	1426	-448	SR
PLB	BG	2016	Corn	GroupA-1006	3.05	0.03	2.40	0.03	2941.78	35.33	501	1426	-925	SR
BBEA	BG	2016	Corn	GroupA-1007	1.83	0.05	1.45	1.57	438.12	21.23	3066	1426	1640	SR
6	BG	2017	Corn	GroupA-1008	7.00	0.07	5.28	0.02	3938.74	74.65	248	1426	-1178	SR
AM	BG	2017	Corn	GroupA-1009	4.81	0.11	3.70	0.11	4801.99	51.35	1746	1426	320	SR
CF	BG	2017	Corn	GroupA-1010	3.37	0.00	2.62	0.07	3976.07	35.98	1099	1426	-327	SR
HB	BG	2017	Corn	GroupA-1011	3.70	0.09	2.94	0.03	4415.29	39.50	557	1426	-869	SR
NH	BG	2017	Corn	GroupA-1012	8.03	0.00	5.96	0.01	4995.12	85.65	226	1426	-1200	SR
PTB	BG	2017	Corn	GroupA-1014	5.43	0.04	4.52	0.02	5528.32	57.91	296	1426	-1130	SR
PL	BG	2017	Corn	GroupA-1015	4.32	0.22	3.28	0.05	3360.23	46.04	979	1426	-447	SR
PLB	BG	2017	Corn	GroupA-1016	5.75	0.11	4.31	0.03	2941.78	61.37	508	1426	-918	SR
BBEA	BG	2017	Corn	GroupA-1017	2.34	0.27	1.82	1.49	438.12	24.97	2889	1426	1463	SR
BS	BG	2017	Corn	GroupA-1019	6.04	0.12	3.75	0.05	7029.70	64.47	757	1426	-669	SR
AM	BG	2018	Corn	GroupA-1021	4.32	0.04	3.07	0.11	4801.99	55.93	1727	1421	306	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CF	BG	2018	Corn	GroupA-1022	3.34	0.00	2.48	0.07	3976.07	43.15	1098	1421	-323	SR
PL	BG	2018	Corn	GroupA-1025	4.14	0.03	3.04	0.05	3360.23	53.56	974	1421	-447	SR
PLB	BG	2018	Corn	GroupA-1026	6.34	0.05	5.18	0.03	2941.78	82.07	506	1421	-915	SR
BBEA	BG	2018	Corn	GroupA-1027	2.44	0.24	1.93	1.59	438.12	31.53	3047	1421	1626	SR
AM	BG	2019	Corn	GroupA-1030	3.50	0.07	2.81	0.05	4801.99	46.76	992	1428	-436	SR
HB	BG	2019	Corn	GroupA-1031	7.46	0.01	6.17	0.02	4415.29	99.54	365	1428	-1063	SR
BBEA	BG	2019	Corn	GroupA-1033	2.25	0.05	1.74	1.59	438.12	30.05	3067	1428	1639	SR
BBEA	BG	2021	Corn	GroupA-1035	2.47	0.09	2.06	1.64	438.12	23.75	3029	1430	1599	SR
BS	BG	2021	Corn	GroupA-1036	6.00	0.00	4.73	0.05	7029.70	57.82	645	1430	-785	SR
6	BBEA	2016	Corn	GroupA-1037	7.58	0.00	5.47	0.01	4348.89	93.72	249	3066	-2817	SR
AM	BBEA	2016	Corn	GroupA-1038	1.87	0.08	1.35	0.04	5233.55	23.19	1759	3066	-1307	SR
HB	BBEA	2016	Corn	GroupA-1039	4.76	0.02	3.55	0.01	4811.25	58.86	366	3066	-2700	SR
NH	BBEA	2016	Corn	GroupA-1040	4.30	0.00	3.46	0.01	5431.98	53.14	222	3066	-2844	SR
PL	BBEA	2016	Corn	GroupA-1041	2.59	0.01	2.02	0.02	3759.77	32.10	978	3066	-2088	SR
PLB	BBEA	2016	Corn	GroupA-1042	3.61	0.00	2.92	0.01	3296.50	44.67	501	3066	-2565	SR
BG	BBEA	2016	Corn	GroupA-1043	1.87	0.05	1.36	0.04	438.12	23.08	1426	3066	-1640	SR
6	BBEA	2017	Corn	GroupA-1044	7.36	0.00	5.21	0.01	4348.89	68.98	248	2889	-2641	SR
AM	BBEA	2017	Corn	GroupA-1045	4.07	0.06	3.07	0.04	5233.55	38.13	1746	2889	-1143	SR
CF	BBEA	2017	Corn	GroupA-1046	3.77	0.00	2.96	0.02	4282.54	35.32	1099	2889	-1790	SR
HB	BBEA	2017	Corn	GroupA-1047	4.87	0.03	3.79	0.02	4811.25	45.63	557	2889	-2332	SR
PTB	BBEA	2017	Corn	GroupA-1050	5.97	0.04	4.74	0.01	5911.78	55.98	296	2889	-2593	SR
PL	BBEA	2017	Corn	GroupA-1051	4.46	0.12	3.62	0.02	3759.77	41.85	979	2889	-1910	SR
PLB	BBEA	2017	Corn	GroupA-1052	5.54	0.06	4.46	0.01	3296.50	51.97	508	2889	-2381	SR
BG	BBEA	2017	Corn	GroupA-1053	2.44	0.23	1.86	0.04	438.12	22.92	1426	2889	-1463	SR
AM	BBEA	2018	Corn	GroupA-1057	3.90	0.05	2.92	0.04	5233.55	50.16	1727	3047	-1320	SR
CF	BBEA	2018	Corn	GroupA-1058	3.66	0.08	2.46	0.02	4282.54	47.09	1098	3047	-1949	SR
PL	BBEA	2018	Corn	GroupA-1061	4.71	0.05	3.65	0.02	3759.77	60.66	974	3047	-2073	SR
PLB	BBEA	2018	Corn	GroupA-1062	6.45	0.06	5.33	0.02	3296.50	83.06	506	3047	-2541	SR
BG	BBEA	2018	Corn	GroupA-1063	3.00	0.14	2.32	0.04	438.12	38.66	1421	3047	-1626	SR
AM	BBEA	2019	Corn	GroupA-1066	2.97	0.04	2.35	0.02	5233.55	41.29	992	3067	-2075	SR
BG	BBEA	2019	Corn	GroupA-1069	2.31	0.07	1.79	0.04	438.12	32.02	1428	3067	-1639	SR
BG	BBEA	2021	Corn	GroupA-1071	2.92	0.10	2.24	0.04	438.12	30.60	1430	3029	-1599	SR
BS	BBEA	2021	Corn	GroupA-1072	6.06	0.00	4.74	0.02	7352.54	63.58	645	3029	-2384	SR
CS	AA	2015	Corn	GroupA-1073	4.41	0.06	3.38	0.11	1521.14	37.61	2451	3961	-1510	SR
CS	AA	2016	Corn	GroupA-1075	7.27	0.01	4.53	0.12	1521.14	74.50	2440	3973	-1533	SR
SP	AA	2016	Corn	GroupA-1076	7.42	0.01	4.95	0.10	3305.23	76.09	1988	3973	-1985	SR
CS	AA	2017	Corn	GroupA-1077	3.88	0.08	3.03	0.11	1521.14	31.23	2373	3860	-1487	SR
SP	AA	2017	Corn	GroupA-1078	7.24	0.01	4.36	0.07	3305.23	58.23	1799	3860	-2061	SR
CS	AA	2018	Corn	GroupA-1080	4.84	0.07	3.78	0.12	1521.14	43.21	2437	3975	-1538	SR
SP	AA	2018	Corn	GroupA-1081	8.34	0.00	6.16	0.10	3305.23	74.44	1988	3975	-1987	SR
2PB	AA	2020	Corn	GroupA-1085	7.61	0.01	5.09	0.09	14577.73	60.32	1769	3962	-2193	SR
AA	CS	2015	Corn	GroupA-1086	3.07	0.15	2.39	0.47	1521.14	35.14	3961	2451	1510	SR
AA	CS	2016	Corn	GroupA-1088	2.07	0.50	1.69	0.44	1521.14	22.98	3973	2440	1533	SR
SP	CS	2016	Corn	GroupA-1089	3.46	0.17	2.44	0.43	2392.70	38.46	1988	2440	-452	SR
AA	CS	2017	Corn	GroupA-1090	2.03	0.13	1.58	0.44	1521.14	16.71	3860	2373	1487	SR
SP	CS	2017	Corn	GroupA-1091	2.74	0.00	1.97	0.07	2392.70	22.62	1799	2373	-574	SR
AA	CS	2018	Corn	GroupA-1093	3.06	0.13	2.53	0.46	1521.14	26.70	3975	2437	1538	SR
SP	CS	2018	Corn	GroupA-1094	4.59	0.00	3.62	0.43	2392.70	40.01	1988	2437	-449	SR
SP	CS	2019	Corn	GroupA-1097	3.35	0.03	2.73	0.49	2392.70	30.77	1989	2440	-451	SR
SP	CS	2021	Corn	GroupA-1099	2.70	0.01	2.14	0.43	2392.70	19.00	1978	2437	-459	SR
6	JL	2017	Corn	GroupA-1101	10.10	0.01	8.76	0.02	31086.42	79.58	248	862	-614	SR
AM	JL	2017	Corn	GroupA-1102	3.04	0.04	2.48	0.10	30699.89	24.00	1746	862	884	SR
CF	JL	2017	Corn	GroupA-1103	7.93	0.13	7.32	0.07	30895.46	62.52	1099	862	237	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
HB	JL	2017	Corn	GroupA-1104	4.45	0.00	3.34	0.03	30527.42	35.03	557	862	-305	SR
PTB	JL	2017	Corn	GroupA-1107	5.34	0.06	4.58	0.02	29375.83	42.09	296	862	-566	SR
PL	JL	2017	Corn	GroupA-1108	5.28	0.00	4.75	0.04	31562.14	41.58	979	862	117	SR
PLB	JL	2017	Corn	GroupA-1109	11.50	0.06	11.05	0.03	31878.96	90.61	508	862	-354	SR
BG	JL	2017	Corn	GroupA-1110	2.76	0.06	2.29	0.10	34820.43	21.78	1426	862	564	SR
BBEA	JL	2017	Corn	GroupA-1111	4.19	0.03	3.67	0.24	35161.19	33.00	2889	862	2027	SR
BS	JL	2017	Corn	GroupA-1112	3.50	0.01	2.66	0.06	27818.58	27.61	757	862	-105	SR
AM	JL	2018	Corn	GroupA-1114	2.76	0.16	2.26	0.07	30699.89	33.00	1727	901	826	SR
CF	JL	2018	Corn	GroupA-1115	4.12	0.01	3.39	0.05	30895.46	49.28	1098	901	197	SR
PL	JL	2018	Corn	GroupA-1118	6.48	0.07	5.34	0.04	31562.14	77.50	974	901	73	SR
PLB	JL	2018	Corn	GroupA-1119	5.82	0.08	4.72	0.03	31878.96	69.62	506	901	-395	SR
BG	JL	2018	Corn	GroupA-1120	3.57	0.06	2.80	0.08	34820.43	42.67	1421	901	520	SR
BBEA	JL	2018	Corn	GroupA-1121	4.51	0.01	3.76	0.16	35161.19	53.93	3047	901	2146	SR
AM	JL	2020	Corn	GroupA-1122	2.69	0.04	2.23	0.05	30699.89	24.51	742	889	-147	SR
CF	JL	2020	Corn	GroupA-1123	4.70	0.04	4.25	0.07	30895.46	42.84	1095	889	206	SR
PE	JL	2020	Corn	GroupA-1125	2.56	0.06	2.02	0.05	31805.51	23.34	942	889	53	SR
PL	JL	2020	Corn	GroupA-1127	2.72	0.00	1.97	0.05	31562.14	24.82	976	889	87	SR
AA	SP	2016	Corn	GroupA-1129	2.27	0.48	1.81	0.59	3305.23	25.97	3973	1988	1985	SR
CS	SP	2016	Corn	GroupA-1130	3.87	0.11	2.01	0.15	2392.70	44.29	2440	1988	452	SR
AA	SP	2017	Corn	GroupA-1131	2.54	0.18	1.96	0.58	3305.23	20.13	3860	1799	2061	SR
CS	SP	2017	Corn	GroupA-1132	3.14	0.00	2.49	0.18	2392.70	24.92	2373	1799	574	SR
AA	SP	2018	Corn	GroupA-1134	2.84	0.14	2.17	0.59	3305.23	27.62	3975	1988	1987	SR
CS	SP	2018	Corn	GroupA-1135	3.01	0.14	2.34	0.16	2392.70	29.28	2437	1988	449	SR
CS	SP	2019	Corn	GroupA-1138	2.73	0.16	2.11	0.15	2392.70	25.98	2440	1989	451	SR
CS	SP	2021	Corn	GroupA-1140	2.26	0.15	1.66	0.15	2392.70	17.03	2437	1978	459	SR
AA	1P	2018	Corn	GroupA-1142	6.79	0.06	5.42	0.18	14966.67	65.78	3975	770	3205	SR
2PB	1P	2018	Corn	GroupA-1145	3.12	0.00	2.56	0.49	884.63	30.22	1764	770	994	SR
AA	1P	2020	Corn	GroupA-1146	3.28	0.01	2.85	0.19	14966.67	25.96	3962	770	3192	SR
2PB	1P	2020	Corn	GroupA-1147	1.57	0.15	1.21	0.50	884.63	12.43	1769	770	999	SR
AA	2PB	2018	Corn	GroupA-1148	6.00	0.00	4.94	0.12	14577.73	56.37	3975	1764	2211	SR
AA	2PB	2020	Corn	GroupA-1152	3.74	0.03	3.16	0.13	14577.73	31.26	3962	1769	2193	SR
CS	MP	2021	Corn	GroupA-1154	3.62	0.16	3.16	0.54	10327.57	33.66	2437	924	1513	SR
SP	MP	2021	Corn	GroupA-1155	5.97	0.00	5.25	0.43	10398.84	55.47	1978	924	1054	SR
6	BS	2017	Corn	GroupA-1156	6.10	0.00	4.97	0.02	3688.53	66.45	248	757	-509	SR
AM	BS	2017	Corn	GroupA-1157	4.02	0.02	3.23	0.11	4011.02	43.75	1746	757	989	SR
CF	BS	2017	Corn	GroupA-1158	6.47	0.05	5.83	0.07	3076.95	70.39	1099	757	342	SR
HB	BS	2017	Corn	GroupA-1159	4.85	0.09	4.12	0.03	3100.07	52.74	557	757	-200	SR
PTB	BS	2017	Corn	GroupA-1162	5.91	0.00	4.88	0.02	2114.72	64.28	296	757	-461	SR
PL	BS	2017	Corn	GroupA-1163	3.12	0.02	2.47	0.05	3972.53	33.91	979	757	222	SR
PLB	BS	2017	Corn	GroupA-1164	3.71	0.01	2.88	0.03	4109.93	40.43	508	757	-249	SR
BG	BS	2017	Corn	GroupA-1165	2.70	0.02	2.09	0.69	7029.70	29.43	1426	757	669	SR
BBEA	BS	2017	Corn	GroupA-1166	2.79	0.00	2.20	1.49	7352.54	30.35	2889	757	2132	SR
AM	BS	2019	Corn	GroupA-1169	3.95	0.01	3.48	0.05	4011.02	41.43	992	749	243	SR
HB	BS	2019	Corn	GroupA-1170	8.05	0.02	6.73	0.02	3100.07	84.30	365	749	-384	SR
BG	BS	2019	Corn	GroupA-1172	2.80	0.00	2.46	0.70	7029.70	29.39	1428	749	679	SR
BBEA	BS	2019	Corn	GroupA-1173	3.28	0.01	2.90	1.59	7352.54	34.38	3067	749	2318	SR
BG	BS	2021	Corn	GroupA-1174	4.42	0.01	3.74	0.72	7029.70	54.01	1430	645	785	SR
BBEA	BS	2021	Corn	GroupA-1175	2.56	0.05	2.04	1.55	7352.54	31.23	3029	645	2384	SR
AA	RD	2015	Corn	GroupA-1176	6.94	0.00	5.42	0.33	28035.93	79.61	3961	1261	2700	SR
CS	RD	2015	Corn	GroupA-1177	5.69	0.00	4.51	0.15	28340.32	65.25	2451	1261	1190	SR
AA	RD	2017	Corn	GroupA-1178	4.79	0.14	4.18	0.33	28035.93	39.87	3860	1261	2599	SR
SP	RD	2017	Corn	GroupA-1180	8.15	0.06	6.79	0.12	30697.43	67.83	1799	1261	538	SR
SP	RD	2019	Corn	GroupA-1182	4.29	0.00	3.36	0.17	30697.43	42.94	1989	1257	732	SR

C.2 Group B

Table C.2: Machine learning results from the scenarios of group B.

Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
RD	AA	2014	Soybeans	GroupB-0001	1.00	0.00	0.73	0.05	28035.93	25.63	1973	3254	-1281	RF
1P	AA	2019	Soybeans	GroupB-0002	0.76	0.01	0.62	0.04	14966.67	19.78	1488	3258	-1770	RF
2PB	AA	2019	Soybeans	GroupB-0003	0.66	0.00	0.52	0.07	14577.73	17.09	2485	3258	-773	RF
1P	AA	2021	Soybeans	GroupB-0004	0.67	0.04	0.52	0.04	14966.67	14.43	1477	3259	-1782	RF
2PB	AA	2021	Soybeans	GroupB-0005	0.66	0.04	0.52	0.07	14577.73	14.28	2478	3259	-781	RF
RD	AA	2021	Soybeans	GroupB-0006	0.69	0.04	0.54	0.05	28035.93	14.91	1966	3259	-1293	RF
RD	CS	2013	Soybeans	GroupB-0007	0.84	0.41	0.72	0.06	28340.32	33.92	1935	1761	174	RF
SP	CS	2020	Soybeans	GroupB-0008	0.72	0.02	0.61	0.09	2392.70	14.97	2659	1762	897	RF
MP	CS	2020	Soybeans	GroupB-0009	0.71	0.05	0.59	0.05	10327.57	14.75	1629	1762	-133	RF
RD	CS	2020	Soybeans	GroupB-0010	0.76	0.04	0.64	0.06	28340.32	15.90	1929	1762	167	RF
CS	SP	2020	Soybeans	GroupB-0011	0.49	0.03	0.40	0.12	2392.70	11.36	3337	1084	2253	RF
MP	SP	2020	Soybeans	GroupB-0012	0.46	0.06	0.36	0.06	10398.84	10.51	1854	1084	770	RF
RD	SP	2020	Soybeans	GroupB-0013	0.62	0.03	0.49	0.07	30697.43	14.21	2154	1084	1070	RF
AA	1P	2019	Soybeans	GroupB-0014	0.78	0.07	0.56	0.17	14966.67	22.23	4268	478	3790	RF
2PB	1P	2019	Soybeans	GroupB-0015	0.71	0.01	0.54	0.06	884.63	20.20	2059	478	1581	RF
AA	1P	2021	Soybeans	GroupB-0016	0.64	0.07	0.50	0.17	14966.67	13.34	4258	478	3780	RF
2PB	1P	2021	Soybeans	GroupB-0017	0.90	0.04	0.79	0.06	884.63	18.88	2063	478	1585	RF
RD	1P	2021	Soybeans	GroupB-0018	0.67	0.08	0.52	0.05	28988.76	14.08	1551	478	1073	RF
AA	2PB	2019	Soybeans	GroupB-0019	0.91	0.01	0.74	0.18	14577.73	25.13	4520	1223	3297	RF
1P	2PB	2019	Soybeans	GroupB-0020	0.91	0.00	0.73	0.04	884.63	25.04	1314	1223	91	RF
AA	2PB	2021	Soybeans	GroupB-0021	0.73	0.07	0.54	0.18	14577.73	17.29	4513	1224	3289	RF
1P	2PB	2021	Soybeans	GroupB-0022	0.82	0.02	0.62	0.04	884.63	19.31	1317	1224	93	RF
RD	2PB	2021	Soybeans	GroupB-0023	0.71	0.07	0.52	0.05	29606.60	16.79	1806	1224	582	RF
CS	MP	2020	Soybeans	GroupB-0024	0.80	0.02	0.58	0.10	10327.57	20.96	2849	542	2307	RF
SP	MP	2020	Soybeans	GroupB-0025	0.72	0.02	0.53	0.08	10398.84	18.70	2396	542	1854	RF
RD	MP	2020	Soybeans	GroupB-0026	0.92	0.01	0.68	0.05	29241.14	24.05	1666	542	1124	RF
CS	RD	2013	Soybeans	GroupB-0027	1.32	0.38	1.23	0.10	28340.32	36.64	2742	954	1788	RF
AA	RD	2014	Soybeans	GroupB-0028	1.14	0.01	1.04	0.18	28035.93	25.03	4273	954	3319	RF
CS	RD	2020	Soybeans	GroupB-0029	0.78	0.05	0.59	0.10	28340.32	21.30	2737	954	1783	RF
SP	RD	2020	Soybeans	GroupB-0030	0.89	0.06	0.68	0.08	30697.43	24.38	2284	954	1330	RF
MP	RD	2020	Soybeans	GroupB-0031	1.14	0.01	0.91	0.04	29241.14	31.26	1254	954	300	RF
AA	RD	2021	Soybeans	GroupB-0032	1.19	0.16	0.93	0.19	28035.93	31.00	4271	954	3317	RF
1P	RD	2021	Soybeans	GroupB-0033	1.16	0.19	0.91	0.03	28988.76	30.19	1075	954	121	RF
2PB	RD	2021	Soybeans	GroupB-0034	1.08	0.22	0.86	0.07	29606.60	28.31	2076	954	1122	RF
CS	AA	2015	Corn	GroupB-0035	2.63	0.12	2.21	0.10	1521.14	22.43	3158	3254	-96	RF
RD	AA	2015	Corn	GroupB-0036	1.97	0.21	1.62	0.05	28035.93	16.80	1968	3254	-1286	RF
CS	AA	2016	Corn	GroupB-0037	1.75	0.01	1.37	0.09	1521.14	17.97	3155	3258	-103	RF
SP	AA	2016	Corn	GroupB-0038	2.03	0.00	1.67	0.08	3305.23	20.85	2703	3258	-555	RF
CS	AA	2017	Corn	GroupB-0039	2.64	0.21	2.19	0.09	1521.14	21.25	3057	3176	-119	RF
SP	AA	2017	Corn	GroupB-0040	2.61	0.18	2.03	0.07	3305.23	21.04	2483	3176	-693	RF
RD	AA	2017	Corn	GroupB-0041	2.72	0.14	2.20	0.06	28035.93	21.85	1945	3176	-1231	RF
CS	AA	2018	Corn	GroupB-0042	2.96	0.16	2.39	0.09	1521.14	26.39	3152	3260	-108	RF
SP	AA	2018	Corn	GroupB-0043	2.80	0.14	2.22	0.08	3305.23	24.94	2703	3260	-557	RF
1P	AA	2018	Corn	GroupB-0044	4.13	0.12	3.54	0.04	14966.67	36.85	1485	3260	-1775	RF
2PB	AA	2018	Corn	GroupB-0045	3.67	0.10	3.11	0.07	14577.73	32.71	2479	3260	-781	RF
1P	AA	2020	Corn	GroupB-0046	1.98	0.11	1.61	0.04	14966.67	15.66	1479	3253	-1774	RF
2PB	AA	2020	Corn	GroupB-0047	1.99	0.08	1.66	0.07	14577.73	15.77	2478	3253	-775	RF
AA	CS	2015	Corn	GroupB-0048	3.36	0.11	2.66	0.19	1521.14	38.45	4647	1765	2882	RF
RD	CS	2015	Corn	GroupB-0049	2.16	0.12	1.73	0.07	28340.32	24.74	1947	1765	182	RF
AA	CS	2016	Corn	GroupB-0050	1.83	0.00	1.52	0.19	1521.14	20.37	4651	1762	2889	RF
SP	CS	2016	Corn	GroupB-0051	1.61	0.04	1.19	0.09	2392.70	17.89	2666	1762	904	RF
AA	CS	2017	Corn	GroupB-0052	1.91	0.15	1.51	0.18	1521.14	15.76	4508	1725	2783	RF

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
SP	CS	2017	Corn	GroupB-0053	1.92	0.13	1.48	0.08	2392.70	15.80	2447	1725	722	RF
RD	CS	2017	Corn	GroupB-0054	1.76	0.08	1.35	0.06	28340.32	14.52	1909	1725	184	RF
AA	CS	2018	Corn	GroupB-0055	2.51	0.24	2.07	0.18	1521.14	21.86	4650	1762	2888	RF
SP	CS	2018	Corn	GroupB-0056	2.67	0.32	2.21	0.09	2392.70	23.32	2663	1762	901	RF
1P	CS	2018	Corn	GroupB-0057	2.49	0.32	2.00	0.04	13564.88	21.69	1445	1762	-317	RF
2PB	CS	2018	Corn	GroupB-0058	2.47	0.32	2.00	0.08	13145.07	21.51	2439	1762	677	RF
SP	CS	2019	Corn	GroupB-0059	2.34	0.26	1.89	0.09	2392.70	21.53	2666	1763	903	RF
RD	CS	2019	Corn	GroupB-0060	2.59	0.26	2.16	0.07	28340.32	23.81	1934	1763	171	RF
SP	CS	2021	Corn	GroupB-0061	1.68	0.30	1.37	0.09	2392.70	11.81	2654	1761	893	RF
MP	CS	2021	Corn	GroupB-0062	1.69	0.29	1.32	0.05	10327.57	11.90	1600	1761	-161	RF
AA	SP	2016	Corn	GroupB-0063	1.61	0.02	1.38	0.20	3305.23	18.42	4878	1083	3795	RF
CS	SP	2016	Corn	GroupB-0064	0.93	0.02	0.66	0.13	2392.70	10.63	3345	1083	2262	RF
AA	SP	2017	Corn	GroupB-0065	2.14	0.33	1.72	0.19	3305.23	17.00	4594	1065	3529	RF
CS	SP	2017	Corn	GroupB-0066	2.64	0.32	2.32	0.11	2392.70	20.96	3107	1065	2042	RF
RD	SP	2017	Corn	GroupB-0067	2.31	0.28	1.87	0.07	30697.43	18.33	1995	1065	930	RF
AA	SP	2018	Corn	GroupB-0068	2.38	0.26	1.84	0.20	3305.23	23.19	4880	1083	3797	RF
CS	SP	2018	Corn	GroupB-0069	2.33	0.34	1.80	0.12	2392.70	22.66	3342	1083	2259	RF
1P	SP	2018	Corn	GroupB-0070	2.70	0.40	2.28	0.05	13803.38	26.26	1675	1083	592	RF
2PB	SP	2018	Corn	GroupB-0071	2.76	0.41	2.35	0.09	13252.46	26.86	2669	1083	1586	RF
CS	SP	2019	Corn	GroupB-0072	2.12	0.33	1.65	0.12	2392.70	20.25	3345	1084	2261	RF
RD	SP	2019	Corn	GroupB-0073	2.82	0.01	2.44	0.07	30697.43	26.90	2162	1084	1078	RF
CS	SP	2021	Corn	GroupB-0074	1.42	0.29	1.00	0.12	2392.70	10.71	3331	1084	2247	RF
MP	SP	2021	Corn	GroupB-0075	2.03	0.13	1.64	0.06	10398.84	15.29	1818	1084	734	RF
AA	1P	2018	Corn	GroupB-0076	2.26	0.03	1.85	0.16	14966.67	21.93	4267	478	3789	RF
CS	1P	2018	Corn	GroupB-0077	1.99	0.24	1.52	0.09	13564.88	19.23	2729	478	2251	RF
SP	1P	2018	Corn	GroupB-0078	2.74	0.00	2.24	0.07	13803.38	26.55	2280	478	1802	RF
2PB	1P	2018	Corn	GroupB-0079	2.24	0.06	1.70	0.06	884.63	21.68	2056	478	1578	RF
AA	1P	2020	Corn	GroupB-0080	1.47	0.04	1.19	0.16	14966.67	11.64	4254	478	3776	RF
2PB	1P	2020	Corn	GroupB-0081	1.29	0.13	1.04	0.06	884.63	10.24	2061	478	1583	RF
AA	2PB	2018	Corn	GroupB-0082	2.94	0.04	2.37	0.17	14577.73	27.59	4516	1223	3293	RF
CS	2PB	2018	Corn	GroupB-0083	2.99	0.07	2.45	0.10	13145.07	28.07	2978	1223	1755	RF
SP	2PB	2018	Corn	GroupB-0084	2.65	0.01	2.14	0.08	13252.46	24.90	2529	1223	1306	RF
1P	2PB	2018	Corn	GroupB-0085	2.79	0.21	2.38	0.04	884.63	26.20	1311	1223	88	RF
AA	2PB	2020	Corn	GroupB-0086	1.86	0.04	1.46	0.17	14577.73	15.52	4508	1223	3285	RF
1P	2PB	2020	Corn	GroupB-0087	1.77	0.14	1.35	0.04	884.63	14.78	1316	1223	93	RF
CS	MP	2021	Corn	GroupB-0088	2.06	0.24	1.60	0.10	10327.57	19.16	2828	533	2295	RF
SP	MP	2021	Corn	GroupB-0089	2.53	0.19	2.01	0.08	10398.84	23.54	2369	533	1836	RF
AA	RD	2015	Corn	GroupB-0090	1.76	0.15	1.45	0.17	28035.93	20.15	4268	954	3314	RF
CS	RD	2015	Corn	GroupB-0091	1.24	0.06	0.99	0.10	28340.32	14.24	2758	954	1804	RF
AA	RD	2017	Corn	GroupB-0092	1.87	0.17	1.32	0.17	28035.93	15.59	4167	954	3213	RF
CS	RD	2017	Corn	GroupB-0093	1.88	0.18	1.50	0.10	28340.32	15.65	2680	954	1726	RF
SP	RD	2017	Corn	GroupB-0094	2.03	0.14	1.46	0.07	30697.43	16.87	2106	954	1152	RF
CS	RD	2019	Corn	GroupB-0095	2.13	0.00	1.75	0.10	28340.32	21.38	2743	954	1789	RF
SP	RD	2019	Corn	GroupB-0096	2.10	0.01	1.70	0.07	30697.43	21.02	2292	954	1338	RF
RD	AA	2014	Soybeans	GroupB-0001	1.10	0.03	0.88	0.03	28035.93	28.00	1973	3254	-1281	SVM
1P	AA	2019	Soybeans	GroupB-0002	0.74	0.04	0.58	0.02	14966.67	19.39	1488	3258	-1770	SVM
2PB	AA	2019	Soybeans	GroupB-0003	0.77	0.02	0.61	0.04	14577.73	20.14	2485	3258	-773	SVM
1P	AA	2021	Soybeans	GroupB-0004	0.71	0.04	0.54	0.02	14966.67	15.32	1477	3259	-1782	SVM
2PB	AA	2021	Soybeans	GroupB-0005	0.75	0.05	0.57	0.04	14577.73	16.24	2478	3259	-781	SVM
RD	AA	2021	Soybeans	GroupB-0006	0.77	0.03	0.59	0.03	28035.93	16.62	1966	3259	-1293	SVM
RD	CS	2013	Soybeans	GroupB-0007	1.02	0.26	0.87	0.03	28340.32	41.44	1935	1761	174	SVM
SP	CS	2020	Soybeans	GroupB-0008	0.79	0.02	0.66	0.05	2392.70	16.40	2659	1762	897	SVM
MP	CS	2020	Soybeans	GroupB-0009	0.70	0.08	0.55	0.02	10327.57	14.48	1629	1762	-133	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
RD	CS	2020	Soybeans	GroupB-0010	0.78	0.06	0.62	0.03	28340.32	16.19	1929	1762	167	SVM
CS	SP	2020	Soybeans	GroupB-0011	0.62	0.00	0.50	0.09	2392.70	14.39	3337	1084	2253	SVM
MP	SP	2020	Soybeans	GroupB-0012	0.57	0.02	0.45	0.03	10398.84	13.06	1854	1084	770	SVM
RD	SP	2020	Soybeans	GroupB-0013	0.67	0.01	0.54	0.04	30697.43	15.40	2154	1084	1070	SVM
AA	1P	2019	Soybeans	GroupB-0014	0.93	0.07	0.75	0.15	14966.67	26.68	4268	478	3790	SVM
2PB	1P	2019	Soybeans	GroupB-0015	0.66	0.10	0.49	0.03	884.63	18.93	2059	478	1581	SVM
AA	1P	2021	Soybeans	GroupB-0016	0.70	0.07	0.53	0.15	14966.67	14.69	4258	478	3780	SVM
2PB	1P	2021	Soybeans	GroupB-0017	0.78	0.05	0.65	0.03	884.63	16.33	2063	478	1585	SVM
RD	1P	2021	Soybeans	GroupB-0018	0.77	0.07	0.59	0.02	28988.76	16.09	1551	478	1073	SVM
AA	2PB	2019	Soybeans	GroupB-0019	1.09	0.04	0.92	0.18	14577.73	30.04	4520	1223	3297	SVM
1P	2PB	2019	Soybeans	GroupB-0020	1.03	0.01	0.82	0.02	884.63	28.29	1314	1223	91	SVM
AA	2PB	2021	Soybeans	GroupB-0021	0.81	0.02	0.60	0.18	14577.73	19.22	4513	1224	3289	SVM
1P	2PB	2021	Soybeans	GroupB-0022	0.88	0.01	0.66	0.01	884.63	20.72	1317	1224	93	SVM
RD	2PB	2021	Soybeans	GroupB-0023	0.96	0.06	0.74	0.03	29606.60	22.60	1806	1224	582	SVM
CS	MP	2020	Soybeans	GroupB-0024	0.90	0.02	0.68	0.06	10327.57	23.33	2849	542	2307	SVM
SP	MP	2020	Soybeans	GroupB-0025	0.97	0.02	0.75	0.04	10398.84	25.24	2396	542	1854	SVM
RD	MP	2020	Soybeans	GroupB-0026	0.94	0.02	0.72	0.02	29241.14	24.60	1666	542	1124	SVM
CS	RD	2013	Soybeans	GroupB-0027	0.78	0.42	0.58	0.06	28340.32	21.56	2742	954	1788	SVM
AA	RD	2014	Soybeans	GroupB-0028	1.09	0.08	0.85	0.16	28035.93	23.89	4273	954	3319	SVM
CS	RD	2020	Soybeans	GroupB-0029	0.83	0.03	0.62	0.06	28340.32	22.70	2737	954	1783	SVM
SP	RD	2020	Soybeans	GroupB-0030	0.87	0.03	0.65	0.04	30697.43	23.76	2284	954	1330	SVM
MP	RD	2020	Soybeans	GroupB-0031	0.84	0.04	0.64	0.01	29241.14	23.05	1254	954	300	SVM
AA	RD	2021	Soybeans	GroupB-0032	1.16	0.09	0.92	0.16	28035.93	30.25	4271	954	3317	SVM
1P	RD	2021	Soybeans	GroupB-0033	1.29	0.10	1.04	0.01	28988.76	33.62	1075	954	121	SVM
2PB	RD	2021	Soybeans	GroupB-0034	1.25	0.13	0.98	0.04	29606.60	32.59	2076	954	1122	SVM
CS	AA	2015	Corn	GroupB-0035	2.31	0.09	1.80	0.07	1521.14	19.71	3158	3254	-96	SVM
RD	AA	2015	Corn	GroupB-0036	1.86	0.13	1.44	0.03	28035.93	15.89	1968	3254	-1286	SVM
CS	AA	2016	Corn	GroupB-0037	2.22	0.02	1.73	0.07	1521.14	22.70	3155	3258	-103	SVM
SP	AA	2016	Corn	GroupB-0038	2.43	0.00	1.93	0.05	3305.23	24.88	2703	3258	-555	SVM
CS	AA	2017	Corn	GroupB-0039	2.92	0.08	2.40	0.06	1521.14	23.51	3057	3176	-119	SVM
SP	AA	2017	Corn	GroupB-0040	2.89	0.11	2.29	0.04	3305.23	23.29	2483	3176	-693	SVM
RD	AA	2017	Corn	GroupB-0041	2.96	0.10	2.39	0.03	28035.93	23.78	1945	3176	-1231	SVM
CS	AA	2018	Corn	GroupB-0042	3.16	0.13	2.51	0.07	1521.14	28.19	3152	3260	-108	SVM
SP	AA	2018	Corn	GroupB-0043	3.17	0.15	2.53	0.05	3305.23	28.31	2703	3260	-557	SVM
1P	AA	2018	Corn	GroupB-0044	3.86	0.09	3.15	0.02	14966.67	34.41	1485	3260	-1775	SVM
2PB	AA	2018	Corn	GroupB-0045	3.47	0.09	2.77	0.04	14577.73	30.93	2479	3260	-781	SVM
1P	AA	2020	Corn	GroupB-0046	1.98	0.10	1.55	0.02	14966.67	15.67	1479	3253	-1774	SVM
2PB	AA	2020	Corn	GroupB-0047	1.94	0.13	1.54	0.04	14577.73	15.37	2478	3253	-775	SVM
AA	CS	2015	Corn	GroupB-0048	2.38	0.20	1.77	0.20	1521.14	27.26	4647	1765	2882	SVM
RD	CS	2015	Corn	GroupB-0049	1.93	0.30	1.52	0.03	28340.32	22.05	1947	1765	182	SVM
AA	CS	2016	Corn	GroupB-0050	2.37	0.00	2.04	0.20	1521.14	26.38	4651	1762	2889	SVM
SP	CS	2016	Corn	GroupB-0051	2.42	0.01	1.91	0.06	2392.70	26.86	2666	1762	904	SVM
AA	CS	2017	Corn	GroupB-0052	2.09	0.10	1.63	0.16	1521.14	17.23	4508	1725	2783	SVM
SP	CS	2017	Corn	GroupB-0053	2.26	0.08	1.76	0.05	2392.70	18.60	2447	1725	722	SVM
RD	CS	2017	Corn	GroupB-0054	1.94	0.12	1.50	0.03	28340.32	15.97	1909	1725	184	SVM
AA	CS	2018	Corn	GroupB-0055	2.53	0.25	1.96	0.18	1521.14	22.07	4650	1762	2888	SVM
SP	CS	2018	Corn	GroupB-0056	2.54	0.26	2.03	0.06	2392.70	22.20	2663	1762	901	SVM
1P	CS	2018	Corn	GroupB-0057	2.64	0.26	2.08	0.02	13564.88	23.06	1445	1762	-317	SVM
2PB	CS	2018	Corn	GroupB-0058	2.61	0.26	2.01	0.05	13145.07	22.78	2439	1762	677	SVM
SP	CS	2019	Corn	GroupB-0059	2.33	0.28	1.82	0.06	2392.70	21.40	2666	1763	903	SVM
RD	CS	2019	Corn	GroupB-0060	2.38	0.28	1.90	0.03	28340.32	21.87	1934	1763	171	SVM
SP	CS	2021	Corn	GroupB-0061	1.84	0.16	1.46	0.05	2392.70	12.97	2654	1761	893	SVM
MP	CS	2021	Corn	GroupB-0062	1.79	0.21	1.40	0.02	10327.57	12.64	1600	1761	-161	SVM

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
AA	SP	2016	Corn	GroupB-0063	2.05	0.01	1.65	0.23	3305.23	23.43	4878	1083	3795	SVM
CS	SP	2016	Corn	GroupB-0064	1.51	0.03	1.15	0.09	2392.70	17.33	3345	1083	2262	SVM
AA	SP	2017	Corn	GroupB-0065	2.48	0.19	1.83	0.17	3305.23	19.71	4594	1065	3529	SVM
CS	SP	2017	Corn	GroupB-0066	2.35	0.24	1.89	0.08	2392.70	18.63	3107	1065	2042	SVM
RD	SP	2017	Corn	GroupB-0067	2.48	0.20	1.93	0.03	30697.43	19.71	1995	1065	930	SVM
AA	SP	2018	Corn	GroupB-0068	2.19	0.35	1.68	0.20	3305.23	21.37	4880	1083	3797	SVM
CS	SP	2018	Corn	GroupB-0069	2.28	0.34	1.75	0.09	2392.70	22.18	3342	1083	2259	SVM
1P	SP	2018	Corn	GroupB-0070	2.53	0.37	2.06	0.02	13803.38	24.69	1675	1083	592	SVM
2PB	SP	2018	Corn	GroupB-0071	2.46	0.37	2.00	0.05	13252.46	23.96	2669	1083	1586	SVM
CS	SP	2019	Corn	GroupB-0072	2.10	0.34	1.64	0.08	2392.70	20.02	3345	1084	2261	SVM
RD	SP	2019	Corn	GroupB-0073	2.32	0.31	1.82	0.04	30697.43	22.14	2162	1084	1078	SVM
CS	SP	2021	Corn	GroupB-0074	1.56	0.22	1.20	0.09	2392.70	11.80	3331	1084	2247	SVM
MP	SP	2021	Corn	GroupB-0075	1.74	0.16	1.39	0.03	10398.84	13.10	1818	1084	734	SVM
AA	1P	2018	Corn	GroupB-0076	2.30	0.17	1.80	0.13	14966.67	22.31	4267	478	3789	SVM
CS	1P	2018	Corn	GroupB-0077	2.14	0.19	1.65	0.05	13564.88	20.77	2729	478	2251	SVM
SP	1P	2018	Corn	GroupB-0078	2.08	0.20	1.58	0.04	13803.38	20.11	2280	478	1802	SVM
2PB	1P	2018	Corn	GroupB-0079	2.65	0.18	2.07	0.03	884.63	25.65	2056	478	1578	SVM
AA	1P	2020	Corn	GroupB-0080	1.59	0.01	1.23	0.14	14966.67	12.60	4254	478	3776	SVM
2PB	1P	2020	Corn	GroupB-0081	1.45	0.06	1.12	0.03	884.63	11.48	2061	478	1583	SVM
AA	2PB	2018	Corn	GroupB-0082	3.13	0.04	2.43	0.15	14577.73	29.39	4516	1223	3293	SVM
CS	2PB	2018	Corn	GroupB-0083	3.13	0.06	2.48	0.06	13145.07	29.40	2978	1223	1755	SVM
SP	2PB	2018	Corn	GroupB-0084	3.14	0.04	2.51	0.05	13252.46	29.51	2529	1223	1306	SVM
1P	2PB	2018	Corn	GroupB-0085	3.01	0.13	2.55	0.02	884.63	28.28	1311	1223	88	SVM
AA	2PB	2020	Corn	GroupB-0086	2.02	0.03	1.57	0.15	14577.73	16.87	4508	1223	3285	SVM
1P	2PB	2020	Corn	GroupB-0087	1.88	0.12	1.41	0.02	884.63	15.66	1316	1223	93	SVM
CS	MP	2021	Corn	GroupB-0088	2.04	0.29	1.55	0.06	10327.57	18.90	2828	533	2295	SVM
SP	MP	2021	Corn	GroupB-0089	2.21	0.20	1.69	0.04	10398.84	20.54	2369	533	1836	SVM
AA	RD	2015	Corn	GroupB-0090	1.73	0.01	1.35	0.15	28035.93	19.87	4268	954	3314	SVM
CS	RD	2015	Corn	GroupB-0091	1.89	0.01	1.50	0.06	28340.32	21.62	2758	954	1804	SVM
AA	RD	2017	Corn	GroupB-0092	2.29	0.03	1.63	0.13	28035.93	19.09	4167	954	3213	SVM
CS	RD	2017	Corn	GroupB-0093	1.96	0.10	1.43	0.06	28340.32	16.33	2680	954	1726	SVM
SP	RD	2017	Corn	GroupB-0094	2.15	0.06	1.57	0.04	30697.43	17.91	2106	954	1152	SVM
CS	RD	2019	Corn	GroupB-0095	2.62	0.00	2.15	0.06	28340.32	26.27	2743	954	1789	SVM
SP	RD	2019	Corn	GroupB-0096	2.77	0.01	2.32	0.04	30697.43	27.73	2292	954	1338	SVM
RD	AA	2014	Soybeans	GroupB-0001	1.26	0.01	0.93	0.00	28035.93	32.12	1973	3254	-1281	ENR
1P	AA	2019	Soybeans	GroupB-0002	0.91	0.05	0.73	0.00	14966.67	23.65	1488	3258	-1770	ENR
2PB	AA	2019	Soybeans	GroupB-0003	0.91	0.00	0.71	0.00	14577.73	23.65	2485	3258	-773	ENR
1P	AA	2021	Soybeans	GroupB-0004	0.70	0.07	0.54	0.01	14966.67	15.09	1477	3259	-1782	ENR
2PB	AA	2021	Soybeans	GroupB-0005	0.72	0.04	0.57	0.00	14577.73	15.53	2478	3259	-781	ENR
RD	AA	2021	Soybeans	GroupB-0006	1.02	0.02	0.81	0.00	28035.93	22.00	1966	3259	-1293	ENR
RD	CS	2013	Soybeans	GroupB-0007	0.87	0.34	0.73	0.00	28340.32	35.31	1935	1761	174	ENR
SP	CS	2020	Soybeans	GroupB-0008	0.73	0.02	0.60	0.00	2392.70	15.26	2659	1762	897	ENR
MP	CS	2020	Soybeans	GroupB-0009	0.74	0.06	0.54	0.00	10327.57	15.31	1629	1762	-133	ENR
RD	CS	2020	Soybeans	GroupB-0010	0.68	0.05	0.54	0.00	28340.32	14.22	1929	1762	167	ENR
CS	SP	2020	Soybeans	GroupB-0011	0.53	0.02	0.41	0.00	2392.70	12.18	3337	1084	2253	ENR
MP	SP	2020	Soybeans	GroupB-0012	0.46	0.09	0.35	0.00	10398.84	10.51	1854	1084	770	ENR
RD	SP	2020	Soybeans	GroupB-0013	0.58	0.00	0.46	0.00	30697.43	13.39	2154	1084	1070	ENR
AA	1P	2019	Soybeans	GroupB-0014	0.87	0.05	0.73	0.00	14966.67	25.03	4268	478	3790	ENR
2PB	1P	2019	Soybeans	GroupB-0015	0.64	0.05	0.48	0.00	884.63	18.37	2059	478	1581	ENR
AA	1P	2021	Soybeans	GroupB-0016	0.63	0.11	0.49	0.01	14966.67	13.08	4258	478	3780	ENR
2PB	1P	2021	Soybeans	GroupB-0017	0.74	0.11	0.63	0.00	884.63	15.51	2063	478	1585	ENR
RD	1P	2021	Soybeans	GroupB-0018	1.15	0.05	0.96	0.00	28988.76	24.13	1551	478	1073	ENR
AA	2PB	2019	Soybeans	GroupB-0019	0.91	0.01	0.74	0.01	14577.73	24.97	4520	1223	3297	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
1P	2PB	2019	Soybeans	GroupB-0020	0.81	0.04	0.61	0.00	884.63	22.24	1314	1223	91	ENR
AA	2PB	2021	Soybeans	GroupB-0021	0.76	0.04	0.57	0.01	14577.73	17.96	4513	1224	3289	ENR
1P	2PB	2021	Soybeans	GroupB-0022	0.77	0.09	0.57	0.01	884.63	18.17	1317	1224	93	ENR
RD	2PB	2021	Soybeans	GroupB-0023	1.28	0.03	1.08	0.00	29606.60	30.31	1806	1224	582	ENR
CS	MP	2020	Soybeans	GroupB-0024	0.79	0.04	0.58	0.00	10327.57	20.56	2849	542	2307	ENR
SP	MP	2020	Soybeans	GroupB-0025	0.72	0.04	0.55	0.00	10398.84	18.64	2396	542	1854	ENR
RD	MP	2020	Soybeans	GroupB-0026	0.84	0.03	0.61	0.00	29241.14	21.79	1666	542	1124	ENR
CS	RD	2013	Soybeans	GroupB-0027	0.78	0.39	0.56	0.00	28340.32	21.59	2742	954	1788	ENR
AA	RD	2014	Soybeans	GroupB-0028	0.79	0.03	0.61	0.01	28035.93	17.39	4273	954	3319	ENR
CS	RD	2020	Soybeans	GroupB-0029	0.83	0.01	0.63	0.00	28340.32	22.73	2737	954	1783	ENR
SP	RD	2020	Soybeans	GroupB-0030	0.85	0.01	0.65	0.01	30697.43	23.34	2284	954	1330	ENR
MP	RD	2020	Soybeans	GroupB-0031	0.84	0.01	0.63	0.00	29241.14	22.94	1254	954	300	ENR
AA	RD	2021	Soybeans	GroupB-0032	1.26	0.12	1.06	0.01	28035.93	32.87	4271	954	3317	ENR
1P	RD	2021	Soybeans	GroupB-0033	1.37	0.16	1.15	0.00	28988.76	35.74	1075	954	121	ENR
2PB	RD	2021	Soybeans	GroupB-0034	1.39	0.13	1.15	0.00	29606.60	36.36	2076	954	1122	ENR
CS	AA	2015	Corn	GroupB-0035	2.18	0.12	1.71	0.00	1521.14	18.57	3158	3254	-96	ENR
RD	AA	2015	Corn	GroupB-0036	1.70	0.19	1.30	0.00	28035.93	14.48	1968	3254	-1286	ENR
CS	AA	2016	Corn	GroupB-0037	2.36	0.02	1.81	0.00	1521.14	24.19	3155	3258	-103	ENR
SP	AA	2016	Corn	GroupB-0038	2.07	0.02	1.57	0.00	3305.23	21.25	2703	3258	-555	ENR
CS	AA	2017	Corn	GroupB-0039	2.91	0.13	2.38	0.00	1521.14	23.41	3057	3176	-119	ENR
SP	AA	2017	Corn	GroupB-0040	2.73	0.16	2.10	0.00	3305.23	22.01	2483	3176	-693	ENR
RD	AA	2017	Corn	GroupB-0041	2.89	0.13	2.30	0.00	28035.93	23.24	1945	3176	-1231	ENR
CS	AA	2018	Corn	GroupB-0042	2.89	0.15	2.27	0.00	1521.14	25.76	3152	3260	-108	ENR
SP	AA	2018	Corn	GroupB-0043	3.05	0.11	2.38	0.00	3305.23	27.18	2703	3260	-557	ENR
1P	AA	2018	Corn	GroupB-0044	3.52	0.11	2.94	0.00	14966.67	31.40	1485	3260	-1775	ENR
2PB	AA	2018	Corn	GroupB-0045	3.00	0.06	2.40	0.00	14577.73	26.80	2479	3260	-781	ENR
1P	AA	2020	Corn	GroupB-0046	1.86	0.12	1.43	0.00	14966.67	14.74	1479	3253	-1774	ENR
2PB	AA	2020	Corn	GroupB-0047	1.90	0.04	1.52	0.00	14577.73	15.04	2478	3253	-775	ENR
AA	CS	2015	Corn	GroupB-0048	2.17	0.21	1.67	0.00	1521.14	24.82	4647	1765	2882	ENR
RD	CS	2015	Corn	GroupB-0049	2.10	0.23	1.58	0.00	28340.32	23.99	1947	1765	182	ENR
AA	CS	2016	Corn	GroupB-0050	1.89	0.00	1.57	0.00	1521.14	21.03	4651	1762	2889	ENR
SP	CS	2016	Corn	GroupB-0051	1.62	0.02	1.26	0.00	2392.70	18.03	2666	1762	904	ENR
AA	CS	2017	Corn	GroupB-0052	1.84	0.15	1.45	0.01	1521.14	15.17	4508	1725	2783	ENR
SP	CS	2017	Corn	GroupB-0053	1.99	0.16	1.54	0.00	2392.70	16.41	2447	1725	722	ENR
RD	CS	2017	Corn	GroupB-0054	1.94	0.11	1.50	0.00	28340.32	15.96	1909	1725	184	ENR
AA	CS	2018	Corn	GroupB-0055	2.62	0.16	2.10	0.01	1521.14	22.88	4650	1762	2888	ENR
SP	CS	2018	Corn	GroupB-0056	2.80	0.16	2.25	0.00	2392.70	24.43	2663	1762	901	ENR
1P	CS	2018	Corn	GroupB-0057	2.62	0.22	2.07	0.00	13564.88	22.85	1445	1762	-317	ENR
2PB	CS	2018	Corn	GroupB-0058	2.92	0.19	2.23	0.00	13145.07	25.51	2439	1762	677	ENR
SP	CS	2019	Corn	GroupB-0059	2.42	0.19	1.98	0.00	2392.70	22.26	2666	1763	903	ENR
RD	CS	2019	Corn	GroupB-0060	2.63	0.22	1.98	0.01	28340.32	24.17	1934	1763	171	ENR
SP	CS	2021	Corn	GroupB-0061	1.78	0.22	1.39	0.00	2392.70	12.56	2654	1761	893	ENR
MP	CS	2021	Corn	GroupB-0062	1.87	0.25	1.50	0.00	10327.57	13.16	1600	1761	-161	ENR
AA	SP	2016	Corn	GroupB-0063	1.26	0.00	1.01	0.00	3305.23	14.40	4878	1083	3795	ENR
CS	SP	2016	Corn	GroupB-0064	1.09	0.01	0.80	0.00	2392.70	12.45	3345	1083	2262	ENR
AA	SP	2017	Corn	GroupB-0065	2.13	0.41	1.77	0.01	3305.23	16.88	4594	1065	3529	ENR
CS	SP	2017	Corn	GroupB-0066	2.45	0.31	2.11	0.00	2392.70	19.46	3107	1065	2042	ENR
RD	SP	2017	Corn	GroupB-0067	2.43	0.20	1.94	0.01	30697.43	19.27	1995	1065	930	ENR
AA	SP	2018	Corn	GroupB-0068	2.29	0.33	1.84	0.01	3305.23	22.33	4880	1083	3797	ENR
CS	SP	2018	Corn	GroupB-0069	2.21	0.36	1.69	0.00	2392.70	21.52	3342	1083	2259	ENR
1P	SP	2018	Corn	GroupB-0070	2.58	0.38	2.16	0.00	13803.38	25.12	1675	1083	592	ENR
2PB	SP	2018	Corn	GroupB-0071	2.17	0.38	1.66	0.00	13252.46	21.10	2669	1083	1586	ENR
CS	SP	2019	Corn	GroupB-0072	2.05	0.35	1.61	0.00	2392.70	19.53	3345	1084	2261	ENR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
RD	SP	2019	Corn	GroupB-0073	2.39	0.21	1.85	0.00	30697.43	22.74	2162	1084	1078	ENR
CS	SP	2021	Corn	GroupB-0074	1.57	0.17	1.15	0.00	2392.70	11.85	3331	1084	2247	ENR
MP	SP	2021	Corn	GroupB-0075	2.20	0.23	1.94	0.00	10398.84	16.58	1818	1084	734	ENR
AA	1P	2018	Corn	GroupB-0076	2.76	0.07	2.21	0.01	14966.67	26.75	4267	478	3789	ENR
CS	1P	2018	Corn	GroupB-0077	2.45	0.07	1.97	0.00	13564.88	23.71	2729	478	2251	ENR
SP	1P	2018	Corn	GroupB-0078	2.67	0.08	2.02	0.00	13803.38	25.84	2280	478	1802	ENR
2PB	1P	2018	Corn	GroupB-0079	2.30	0.08	1.74	0.00	884.63	22.26	2056	478	1578	ENR
AA	1P	2020	Corn	GroupB-0080	1.33	0.09	1.04	0.01	14966.67	10.54	4254	478	3776	ENR
2PB	1P	2020	Corn	GroupB-0081	1.35	0.22	1.02	0.00	884.63	10.67	2061	478	1583	ENR
AA	2PB	2018	Corn	GroupB-0082	2.49	0.06	1.94	0.01	14577.73	23.43	4516	1223	3293	ENR
CS	2PB	2018	Corn	GroupB-0083	2.68	0.04	2.11	0.00	13145.07	25.18	2978	1223	1755	ENR
SP	2PB	2018	Corn	GroupB-0084	2.74	0.03	2.16	0.00	13252.46	25.74	2529	1223	1306	ENR
1P	2PB	2018	Corn	GroupB-0085	2.96	0.13	2.45	0.01	884.63	27.77	1311	1223	88	ENR
AA	2PB	2020	Corn	GroupB-0086	1.95	0.00	1.50	0.01	14577.73	16.32	4508	1223	3285	ENR
1P	2PB	2020	Corn	GroupB-0087	1.87	0.10	1.40	0.00	884.63	15.58	1316	1223	93	ENR
CS	MP	2021	Corn	GroupB-0088	2.27	0.27	1.78	0.00	10327.57	21.07	2828	533	2295	ENR
SP	MP	2021	Corn	GroupB-0089	3.00	0.14	2.47	0.00	10398.84	27.82	2369	533	1836	ENR
AA	RD	2015	Corn	GroupB-0090	1.51	0.05	1.18	0.01	28035.93	17.37	4268	954	3314	ENR
CS	RD	2015	Corn	GroupB-0091	1.64	0.00	1.28	0.00	28340.32	18.79	2758	954	1804	ENR
AA	RD	2017	Corn	GroupB-0092	2.15	0.08	1.68	0.01	28035.93	17.93	4167	954	3213	ENR
CS	RD	2017	Corn	GroupB-0093	2.37	0.09	1.86	0.00	28340.32	19.69	2680	954	1726	ENR
SP	RD	2017	Corn	GroupB-0094	2.47	0.04	1.86	0.00	30697.43	20.54	2106	954	1152	ENR
CS	RD	2019	Corn	GroupB-0095	2.45	0.00	2.03	0.00	28340.32	24.58	2743	954	1789	ENR
SP	RD	2019	Corn	GroupB-0096	2.19	0.00	1.68	0.00	30697.43	21.95	2292	954	1338	ENR
RD	AA	2014	Soybeans	GroupB-0001	1.26	0.01	0.94	0.22	28035.93	32.30	1973	3254	-1281	SR
1P	AA	2019	Soybeans	GroupB-0002	0.90	0.05	0.73	0.17	14966.67	23.59	1488	3258	-1770	SR
2PB	AA	2019	Soybeans	GroupB-0003	0.91	0.00	0.71	0.28	14577.73	23.65	2485	3258	-773	SR
1P	AA	2021	Soybeans	GroupB-0004	0.72	0.06	0.55	0.17	14966.67	15.49	1477	3259	-1782	SR
2PB	AA	2021	Soybeans	GroupB-0005	0.73	0.03	0.59	0.29	14577.73	15.82	2478	3259	-781	SR
RD	AA	2021	Soybeans	GroupB-0006	1.02	0.02	0.81	0.22	28035.93	22.08	1966	3259	-1293	SR
RD	CS	2013	Soybeans	GroupB-0007	0.85	0.32	0.71	1.02	28340.32	34.63	1935	1761	174	SR
SP	CS	2020	Soybeans	GroupB-0008	0.75	0.03	0.57	1.10	2392.70	15.65	2659	1762	897	SR
MP	CS	2020	Soybeans	GroupB-0009	0.74	0.06	0.54	0.66	10327.57	15.49	1629	1762	-133	SR
RD	CS	2020	Soybeans	GroupB-0010	0.74	0.05	0.57	1.00	28340.32	15.35	1929	1762	167	SR
CS	SP	2020	Soybeans	GroupB-0011	0.53	0.04	0.42	1.69	2392.70	12.21	3337	1084	2253	SR
MP	SP	2020	Soybeans	GroupB-0012	0.46	0.09	0.36	0.94	10398.84	10.68	1854	1084	770	SR
RD	SP	2020	Soybeans	GroupB-0013	0.60	0.00	0.47	1.08	30697.43	13.80	2154	1084	1070	SR
AA	1P	2019	Soybeans	GroupB-0014	0.85	0.05	0.71	1.75	14966.67	24.29	4268	478	3790	SR
2PB	1P	2019	Soybeans	GroupB-0015	0.64	0.04	0.47	0.73	884.63	18.37	2059	478	1581	SR
AA	1P	2021	Soybeans	GroupB-0016	0.63	0.10	0.50	1.54	14966.67	13.24	4258	478	3780	SR
2PB	1P	2021	Soybeans	GroupB-0017	0.74	0.09	0.63	0.76	884.63	15.55	2063	478	1585	SR
RD	1P	2021	Soybeans	GroupB-0018	1.21	0.06	1.02	0.55	28988.76	25.36	1551	478	1073	SR
AA	2PB	2019	Soybeans	GroupB-0019	0.91	0.01	0.74	1.65	14577.73	24.97	4520	1223	3297	SR
1P	2PB	2019	Soybeans	GroupB-0020	0.85	0.03	0.62	0.57	884.63	23.28	1314	1223	91	SR
AA	2PB	2021	Soybeans	GroupB-0021	0.76	0.03	0.58	1.65	14577.73	18.04	4513	1224	3289	SR
1P	2PB	2021	Soybeans	GroupB-0022	0.78	0.08	0.58	0.59	884.63	18.44	1317	1224	93	SR
RD	2PB	2021	Soybeans	GroupB-0023	1.32	0.02	1.12	0.55	29606.60	31.20	1806	1224	582	SR
CS	MP	2020	Soybeans	GroupB-0024	0.77	0.03	0.56	1.44	10327.57	20.09	2849	542	2307	SR
SP	MP	2020	Soybeans	GroupB-0025	0.68	0.03	0.52	1.00	10398.84	17.76	2396	542	1854	SR
RD	MP	2020	Soybeans	GroupB-0026	0.86	0.03	0.62	0.83	29241.14	22.50	1666	542	1124	SR
CS	RD	2013	Soybeans	GroupB-0027	0.83	0.32	0.59	1.43	28340.32	23.11	2742	954	1788	SR
AA	RD	2014	Soybeans	GroupB-0028	0.81	0.02	0.62	2.19	28035.93	17.69	4273	954	3319	SR
CS	RD	2020	Soybeans	GroupB-0029	0.86	0.01	0.66	1.42	28340.32	23.49	2737	954	1783	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
SP	RD	2020	Soybeans	GroupB-0030	0.88	0.01	0.68	1.17	30697.43	24.17	2284	954	1330	SR
MP	RD	2020	Soybeans	GroupB-0031	0.87	0.01	0.66	0.62	29241.14	23.89	1254	954	300	SR
AA	RD	2021	Soybeans	GroupB-0032	1.28	0.12	1.06	2.18	28035.93	33.37	4271	954	3317	SR
1P	RD	2021	Soybeans	GroupB-0033	1.49	0.12	1.20	0.53	28988.76	38.96	1075	954	121	SR
2PB	RD	2021	Soybeans	GroupB-0034	1.45	0.10	1.17	1.05	29606.60	37.97	2076	954	1122	SR
CS	AA	2015	Corn	GroupB-0035	2.35	0.10	1.75	0.36	1521.14	20.04	3158	3254	-96	SR
RD	AA	2015	Corn	GroupB-0036	1.67	0.19	1.28	0.22	28035.93	14.22	1968	3254	-1286	SR
CS	AA	2016	Corn	GroupB-0037	2.33	0.04	1.79	0.35	1521.14	23.93	3155	3258	-103	SR
SP	AA	2016	Corn	GroupB-0038	2.09	0.02	1.58	0.30	3305.23	21.40	2703	3258	-555	SR
CS	AA	2017	Corn	GroupB-0039	3.05	0.10	2.43	0.35	1521.14	24.55	3057	3176	-119	SR
SP	AA	2017	Corn	GroupB-0040	2.93	0.14	2.17	0.28	3305.23	23.55	2483	3176	-693	SR
RD	AA	2017	Corn	GroupB-0041	2.94	0.13	2.33	0.22	28035.93	23.69	1945	3176	-1231	SR
CS	AA	2018	Corn	GroupB-0042	2.96	0.14	2.32	0.36	1521.14	26.36	3152	3260	-108	SR
SP	AA	2018	Corn	GroupB-0043	3.08	0.10	2.41	0.34	3305.23	27.51	2703	3260	-557	SR
1P	AA	2018	Corn	GroupB-0044	3.70	0.11	3.08	0.17	14966.67	33.03	1485	3260	-1775	SR
2PB	AA	2018	Corn	GroupB-0045	3.04	0.07	2.43	0.29	14577.73	27.14	2479	3260	-781	SR
1P	AA	2020	Corn	GroupB-0046	1.88	0.12	1.45	0.17	14966.67	14.92	1479	3253	-1774	SR
2PB	AA	2020	Corn	GroupB-0047	1.91	0.05	1.53	0.29	14577.73	15.13	2478	3253	-775	SR
AA	CS	2015	Corn	GroupB-0048	2.16	0.21	1.65	2.34	1521.14	24.68	4647	1765	2882	SR
RD	CS	2015	Corn	GroupB-0049	2.15	0.23	1.61	1.00	28340.32	24.53	1947	1765	182	SR
AA	CS	2016	Corn	GroupB-0050	1.86	0.00	1.54	2.31	1521.14	20.71	4651	1762	2889	SR
SP	CS	2016	Corn	GroupB-0051	1.70	0.01	1.28	1.35	2392.70	18.89	2666	1762	904	SR
AA	CS	2017	Corn	GroupB-0052	1.84	0.14	1.45	2.30	1521.14	15.21	4508	1725	2783	SR
SP	CS	2017	Corn	GroupB-0053	1.92	0.12	1.48	1.22	2392.70	15.85	2447	1725	722	SR
RD	CS	2017	Corn	GroupB-0054	1.95	0.11	1.50	0.95	28340.32	16.04	1909	1725	184	SR
AA	CS	2018	Corn	GroupB-0055	2.63	0.16	2.10	2.31	1521.14	22.92	4650	1762	2888	SR
SP	CS	2018	Corn	GroupB-0056	2.91	0.12	2.31	1.34	2392.70	25.41	2663	1762	901	SR
1P	CS	2018	Corn	GroupB-0057	2.73	0.20	2.18	0.73	13564.88	23.78	1445	1762	-317	SR
2PB	CS	2018	Corn	GroupB-0058	2.90	0.19	2.21	1.25	13145.07	25.29	2439	1762	677	SR
SP	CS	2019	Corn	GroupB-0059	2.46	0.18	2.01	1.35	2392.70	22.63	2666	1763	903	SR
RD	CS	2019	Corn	GroupB-0060	2.64	0.22	1.98	1.04	28340.32	24.29	1934	1763	171	SR
SP	CS	2021	Corn	GroupB-0061	1.82	0.20	1.40	1.09	2392.70	12.81	2654	1761	893	SR
MP	CS	2021	Corn	GroupB-0062	1.89	0.26	1.52	0.70	10327.57	13.31	1600	1761	-161	SR
AA	SP	2016	Corn	GroupB-0063	1.25	0.00	0.99	2.45	3305.23	14.27	4878	1083	3795	SR
CS	SP	2016	Corn	GroupB-0064	1.15	0.01	0.85	1.68	2392.70	13.17	3345	1083	2262	SR
AA	SP	2017	Corn	GroupB-0065	2.13	0.40	1.77	2.29	3305.23	16.90	4594	1065	3529	SR
CS	SP	2017	Corn	GroupB-0066	2.43	0.29	2.07	1.56	2392.70	19.26	3107	1065	2042	SR
RD	SP	2017	Corn	GroupB-0067	2.51	0.19	2.02	1.00	30697.43	19.93	1995	1065	930	SR
AA	SP	2018	Corn	GroupB-0068	2.28	0.32	1.82	2.48	3305.23	22.22	4880	1083	3797	SR
CS	SP	2018	Corn	GroupB-0069	2.19	0.37	1.67	1.96	2392.70	21.32	3342	1083	2259	SR
1P	SP	2018	Corn	GroupB-0070	2.61	0.37	2.18	0.83	13803.38	25.42	1675	1083	592	SR
2PB	SP	2018	Corn	GroupB-0071	2.17	0.38	1.67	1.35	13252.46	21.08	2669	1083	1586	SR
CS	SP	2019	Corn	GroupB-0072	2.07	0.34	1.64	1.71	2392.70	19.73	3345	1084	2261	SR
RD	SP	2019	Corn	GroupB-0073	2.35	0.21	1.82	1.08	30697.43	22.44	2162	1084	1078	SR
CS	SP	2021	Corn	GroupB-0074	1.59	0.17	1.17	1.74	2392.70	12.01	3331	1084	2247	SR
MP	SP	2021	Corn	GroupB-0075	2.38	0.23	2.10	0.92	10398.84	17.95	1818	1084	734	SR
AA	1P	2018	Corn	GroupB-0076	2.77	0.09	2.22	1.90	14966.67	26.85	4267	478	3789	SR
CS	1P	2018	Corn	GroupB-0077	2.24	0.13	1.75	0.98	13564.88	21.67	2729	478	2251	SR
SP	1P	2018	Corn	GroupB-0078	2.65	0.10	1.87	0.80	13803.38	25.69	2280	478	1802	SR
2PB	1P	2018	Corn	GroupB-0079	2.28	0.08	1.72	0.72	884.63	22.08	2056	478	1578	SR
AA	1P	2020	Corn	GroupB-0080	1.33	0.10	1.03	1.54	14966.67	10.51	4254	478	3776	SR
2PB	1P	2020	Corn	GroupB-0081	1.37	0.23	1.04	0.82	884.63	10.82	2061	478	1583	SR
AA	2PB	2018	Corn	GroupB-0082	2.48	0.07	1.93	1.70	14577.73	23.26	4516	1223	3293	SR

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Train	Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Distance [m]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
CS	2PB	2018	Corn	GroupB-0083	2.67	0.06	2.10	1.07	13145.07	25.05	2978	1223	1755	SR
SP	2PB	2018	Corn	GroupB-0084	2.86	0.02	2.27	0.91	13252.46	26.85	2529	1223	1306	SR
1P	2PB	2018	Corn	GroupB-0085	3.25	0.10	2.66	0.56	884.63	30.57	1311	1223	88	SR
AA	2PB	2020	Corn	GroupB-0086	1.96	0.00	1.51	1.66	14577.73	16.37	4508	1223	3285	SR
1P	2PB	2020	Corn	GroupB-0087	2.01	0.07	1.48	0.58	884.63	16.78	1316	1223	93	SR
CS	MP	2021	Corn	GroupB-0088	2.35	0.25	1.86	1.43	10327.57	21.85	2828	533	2295	SR
SP	MP	2021	Corn	GroupB-0089	3.12	0.08	2.57	0.95	10398.84	28.93	2369	533	1836	SR
AA	RD	2015	Corn	GroupB-0090	1.52	0.05	1.19	2.48	28035.93	17.47	4268	954	3314	SR
CS	RD	2015	Corn	GroupB-0091	1.78	0.00	1.37	1.39	28340.32	20.42	2758	954	1804	SR
AA	RD	2017	Corn	GroupB-0092	2.17	0.08	1.68	2.12	28035.93	18.07	4167	954	3213	SR
CS	RD	2017	Corn	GroupB-0093	2.45	0.07	1.87	1.36	28340.32	20.41	2680	954	1726	SR
SP	RD	2017	Corn	GroupB-0094	2.44	0.04	1.82	1.07	30697.43	20.35	2106	954	1152	SR
CS	RD	2019	Corn	GroupB-0095	2.80	0.00	2.25	1.44	28340.32	28.04	2743	954	1789	SR
SP	RD	2019	Corn	GroupB-0096	2.14	0.00	1.67	1.16	30697.43	21.40	2292	954	1338	SR

C.3 Group C

Table C.3: Machine learning results from the scenarios of group C.

Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
6	2013	Soybeans	GroupC-0001	0.39	0.36	0.29	0.02	10.34	994	249	745	RF
6	2014	Soybeans	GroupC-0002	1.19	0.28	1.11	0.02	27.23	993	250	743	RF
6	2015	Soybeans	GroupC-0003	1.60	0.35	1.55	0.02	60.72	992	251	741	RF
6	2020	Soybeans	GroupC-0004	0.55	0.24	0.41	0.02	14.84	996	247	749	RF
6	2021	Soybeans	GroupC-0005	0.72	0.19	0.56	0.02	18.65	997	246	751	RF
AM	2013	Soybeans	GroupC-0006	1.03	0.31	0.83	0.27	31.85	6681	1748	4933	RF
AM	2014	Soybeans	GroupC-0007	1.23	0.47	1.12	0.26	31.45	6681	1748	4933	RF
AM	2015	Soybeans	GroupC-0008	1.26	0.21	1.16	0.28	61.33	6962	1467	5495	RF
AM	2019	Soybeans	GroupC-0009	0.66	0.37	0.53	0.31	24.07	7684	745	6939	RF
AM	2020	Soybeans	GroupC-0010	0.89	0.09	0.67	0.30	20.84	7438	991	6447	RF
AM	2021	Soybeans	GroupC-0011	1.15	0.04	0.81	0.26	32.64	6699	1730	4969	RF
CF	2012	Soybeans	GroupC-0012	0.67	0.10	0.51	0.16	17.46	4365	1099	3266	RF
CF	2015	Soybeans	GroupC-0013	0.63	0.23	0.51	0.16	18.98	4367	1097	3270	RF
CF	2016	Soybeans	GroupC-0014	0.59	0.26	0.43	0.16	16.88	4381	1083	3298	RF
CF	2019	Soybeans	GroupC-0015	0.62	0.12	0.49	0.15	17.85	4369	1095	3274	RF
CF	2021	Soybeans	GroupC-0016	1.26	0.08	1.07	0.16	28.35	4374	1090	3284	RF
HB	2013	Soybeans	GroupC-0017	0.87	0.01	0.75	0.08	30.59	2561	558	2003	RF
HB	2014	Soybeans	GroupC-0018	1.02	0.26	0.84	0.07	33.17	2564	555	2009	RF
HB	2016	Soybeans	GroupC-0020	0.61	0.30	0.46	0.09	25.51	2938	181	2757	RF
HB	2018	Soybeans	GroupC-0021	1.07	0.12	0.91	0.09	29.82	2935	184	2751	RF
HB	2019	Soybeans	GroupC-0022	1.35	0.53	1.20	0.09	71.97	2945	174	2771	RF
HB	2020	Soybeans	GroupC-0023	1.03	0.04	0.81	0.08	32.13	2564	555	2009	RF
HB	2021	Soybeans	GroupC-0024	0.68	0.06	0.53	0.08	18.71	2756	363	2393	RF
NH	2013	Soybeans	GroupC-0025	1.09	0.67	0.88	0.01	43.51	232	173	59	RF
NH	2020	Soybeans	GroupC-0026	1.22	0.60	1.02	0.01	37.53	224	181	43	RF
NH	2021	Soybeans	GroupC-0027	1.53	0.21	1.32	0.01	60.33	354	51	303	RF
PB	2012	Soybeans	GroupC-0028	1.57	0.18	1.35	0.05	49.17	1843	335	1508	RF
PB	2014	Soybeans	GroupC-0029	1.37	0.18	1.13	0.05	39.17	1844	334	1510	RF
PB	2015	Soybeans	GroupC-0030	1.07	0.59	0.96	0.05	52.83	1851	327	1524	RF
PB	2016	Soybeans	GroupC-0031	0.84	0.61	0.73	0.05	32.05	1847	331	1516	RF
PB	2018	Soybeans	GroupC-0032	1.27	0.16	1.04	0.05	44.37	1851	327	1524	RF
PB	2019	Soybeans	GroupC-0033	1.44	0.18	1.17	0.05	71.15	1900	278	1622	RF
PB	2021	Soybeans	GroupC-0034	1.83	0.00	1.54	0.05	65.28	1932	246	1686	RF
PE	2018	Soybeans	GroupC-0035	0.97	0.06	0.75	0.06	20.77	1880	941	939	RF
PE	2019	Soybeans	GroupC-0036	1.37	0.02	1.20	0.06	39.00	1879	942	937	RF
PE	2021	Soybeans	GroupC-0037	1.10	0.09	0.82	0.06	23.32	1883	938	945	RF
PW	2018	Soybeans	GroupC-0038	0.82	0.03	0.68	0.01	17.97	505	257	248	RF
PW	2019	Soybeans	GroupC-0039	1.22	0.02	1.04	0.01	33.65	503	259	244	RF
PW	2021	Soybeans	GroupC-0040	0.77	0.06	0.61	0.01	17.52	516	246	270	RF
PTB	2013	Soybeans	GroupC-0041	1.20	0.15	1.06	0.05	32.82	1971	289	1682	RF
PTB	2014	Soybeans	GroupC-0042	0.66	0.29	0.46	0.05	19.76	1961	299	1662	RF
PTB	2015	Soybeans	GroupC-0043	0.77	0.20	0.64	0.05	44.02	1957	303	1654	RF
PTB	2016	Soybeans	GroupC-0044	0.78	0.33	0.65	0.05	26.75	1963	297	1666	RF
PTB	2018	Soybeans	GroupC-0045	1.46	0.18	1.34	0.05	36.46	1971	289	1682	RF
PTB	2020	Soybeans	GroupC-0047	0.85	0.41	0.75	0.06	46.08	1998	262	1736	RF
PTB	2021	Soybeans	GroupC-0048	0.67	0.55	0.51	0.06	34.77	2009	251	1758	RF
PL	2012	Soybeans	GroupC-0049	1.02	0.00	0.81	0.13	28.37	3825	855	2970	RF
PL	2014	Soybeans	GroupC-0050	0.71	0.16	0.57	0.13	17.86	3706	974	2732	RF
PL	2015	Soybeans	GroupC-0051	1.05	0.21	0.91	0.13	35.86	3775	905	2870	RF
PL	2019	Soybeans	GroupC-0052	0.60	0.25	0.47	0.13	18.56	3712	968	2744	RF
PL	2021	Soybeans	GroupC-0053	1.38	0.17	1.23	0.12	29.86	3702	978	2724	RF
PLB	2012	Soybeans	GroupC-0054	1.37	0.00	1.12	0.07	38.38	1992	502	1490	RF

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PLB	2014	Soybeans	GroupC-0055	0.77	0.47	0.64	0.06	20.49	1994	500	1494	RF
PLB	2015	Soybeans	GroupC-0056	1.53	0.49	1.42	0.06	67.09	1995	499	1496	RF
PLB	2019	Soybeans	GroupC-0057	0.90	0.45	0.68	0.06	32.07	1992	502	1490	RF
PLB	2021	Soybeans	GroupC-0058	1.55	0.19	1.39	0.06	37.52	2003	491	1512	RF
BG	2013	Soybeans	GroupC-0059	1.20	0.21	1.01	0.15	34.29	4258	1438	2820	RF
BG	2014	Soybeans	GroupC-0060	0.87	0.30	0.72	0.15	49.85	4258	1438	2820	RF
BG	2020	Soybeans	GroupC-0062	0.99	0.14	0.75	0.15	26.42	4260	1436	2824	RF
BBEA	2013	Soybeans	GroupC-0063	0.94	0.12	0.71	0.39	33.97	8931	3081	5850	RF
BBEA	2014	Soybeans	GroupC-0064	0.73	0.14	0.59	0.39	40.03	8928	3084	5844	RF
BBEA	2020	Soybeans	GroupC-0066	1.32	0.06	1.12	0.39	39.02	8976	3036	5940	RF
AA	2014	Soybeans	GroupC-0068	1.03	0.16	0.78	0.38	26.35	8320	3968	4352	RF
AA	2019	Soybeans	GroupC-0069	0.75	0.26	0.58	0.39	19.56	8312	3976	4336	RF
AA	2021	Soybeans	GroupC-0070	3.39	0.04	3.32	0.40	73.37	8322	3966	4356	RF
CS	2012	Soybeans	GroupC-0071	2.08	0.02	1.81	0.19	57.13	4877	1942	2935	RF
CS	2013	Soybeans	GroupC-0072	2.34	0.17	2.16	0.16	94.63	4379	2440	1939	RF
CS	2020	Soybeans	GroupC-0073	2.49	0.16	2.34	0.16	51.84	4382	2437	1945	RF
JL	2021	Soybeans	GroupC-0075	2.46	0.10	2.37	0.03	54.21	888	884	4	RF
SP	2012	Soybeans	GroupC-0076	1.04	0.17	0.86	0.31	43.24	7960	1929	6031	RF
SP	2014	Soybeans	GroupC-0078	0.86	0.29	0.70	0.31	40.54	7896	1993	5903	RF
SP	2020	Soybeans	GroupC-0080	3.44	0.07	3.39	0.31	79.37	7905	1984	5921	RF
1P	2019	Soybeans	GroupC-0081	1.55	0.13	1.33	0.02	44.49	770	770	0	RF
1P	2021	Soybeans	GroupC-0082	1.54	0.11	1.33	0.02	32.26	770	770	0	RF
2PB	2019	Soybeans	GroupC-0083	1.16	0.04	0.88	0.06	31.89	1771	1767	4	RF
2PB	2021	Soybeans	GroupC-0084	1.14	0.03	0.85	0.06	26.86	1767	1771	-4	RF
BS	2013	Soybeans	GroupC-0085	0.78	0.50	0.69	0.11	24.56	3555	656	2899	RF
BS	2014	Soybeans	GroupC-0086	0.92	0.60	0.71	0.12	38.16	3555	656	2899	RF
BS	2016	Soybeans	GroupC-0088	0.76	0.48	0.64	0.11	30.30	3556	655	2901	RF
BS	2018	Soybeans	GroupC-0089	2.14	0.22	2.00	0.11	56.54	3459	752	2707	RF
BS	2020	Soybeans	GroupC-0090	2.09	0.19	1.95	0.11	61.49	3463	748	2715	RF
RD	2013	Soybeans	GroupC-0092	0.95	0.24	0.65	0.23	26.27	6279	1256	5023	RF
RD	2014	Soybeans	GroupC-0093	1.38	0.36	1.21	0.23	30.32	6276	1259	5017	RF
RD	2016	Soybeans	GroupC-0094	1.51	0.35	1.35	0.23	48.79	6281	1254	5027	RF
RD	2018	Soybeans	GroupC-0095	0.90	0.42	0.70	0.23	21.38	6282	1253	5029	RF
RD	2020	Soybeans	GroupC-0096	0.92	0.21	0.69	0.23	25.21	6281	1254	5027	RF
RD	2021	Soybeans	GroupC-0097	0.94	0.38	0.72	0.24	24.54	6276	1259	5017	RF
6	2016	Corn	GroupC-0098	2.30	0.05	2.00	0.02	25.47	738	249	489	RF
6	2017	Corn	GroupC-0099	4.28	0.48	4.00	0.02	35.41	739	248	491	RF
6	2018	Corn	GroupC-0100	2.90	0.46	2.47	0.02	36.81	743	244	499	RF
6	2019	Corn	GroupC-0101	2.46	0.00	2.20	0.02	37.19	741	246	495	RF
AM	2015	Corn	GroupC-0102	3.05	0.07	2.71	0.28	42.75	6966	276	6690	RF
AM	2016	Corn	GroupC-0103	1.98	0.02	1.68	0.21	22.43	5483	1759	3724	RF
AM	2017	Corn	GroupC-0104	4.35	0.38	4.03	0.21	36.10	5496	1746	3750	RF
AM	2018	Corn	GroupC-0105	2.00	0.02	1.57	0.21	25.15	5515	1727	3788	RF
AM	2019	Corn	GroupC-0106	1.92	0.10	1.71	0.26	30.32	6250	992	5258	RF
AM	2020	Corn	GroupC-0107	2.40	0.05	2.05	0.26	31.01	6500	742	5758	RF
CF	2013	Corn	GroupC-0108	1.22	0.07	0.96	0.15	13.69	4378	1093	3285	RF
CF	2014	Corn	GroupC-0109	4.49	0.02	3.89	0.16	37.17	4385	1086	3299	RF
CF	2017	Corn	GroupC-0110	3.56	0.09	3.21	0.15	32.50	4372	1099	3273	RF
CF	2018	Corn	GroupC-0111	4.01	0.04	3.57	0.15	53.84	4373	1098	3275	RF
CF	2020	Corn	GroupC-0112	1.48	0.06	1.20	0.15	17.61	4376	1095	3281	RF
HB	2016	Corn	GroupC-0113	3.26	0.07	2.88	0.04	35.59	1285	366	919	RF
HB	2017	Corn	GroupC-0114	4.02	0.30	3.56	0.02	42.67	1094	557	537	RF
HB	2018	Corn	GroupC-0115	4.64	0.60	4.31	0.04	81.51	1288	363	925	RF

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
HB	2019	Corn	GroupC-0116	2.33	0.61	1.99	0.04	38.08	1286	365	921	RF
NH	2014	Corn	GroupC-0117	3.50	0.08	3.29	0.03	33.67	1106	223	883	RF
NH	2015	Corn	GroupC-0118	1.63	0.00	1.39	0.03	23.27	1108	221	887	RF
NH	2016	Corn	GroupC-0119	1.01	0.16	0.84	0.03	13.17	1107	222	885	RF
NH	2017	Corn	GroupC-0120	4.14	0.41	3.86	0.03	40.01	1103	226	877	RF
NH	2018	Corn	GroupC-0121	4.35	0.37	4.04	0.03	69.30	1107	222	885	RF
NH	2019	Corn	GroupC-0122	1.59	0.22	1.26	0.03	21.18	1114	215	899	RF
PB	2013	Corn	GroupC-0123	1.87	0.35	1.45	0.02	16.98	671	327	344	RF
PB	2017	Corn	GroupC-0124	2.71	0.31	2.31	0.02	20.75	660	338	322	RF
PB	2020	Corn	GroupC-0125	1.87	0.26	1.55	0.02	17.10	665	333	332	RF
PL	2013	Corn	GroupC-0126	1.64	0.09	1.34	0.13	16.18	3962	972	2990	RF
PL	2015	Corn	GroupC-0127	1.12	0.12	0.85	0.17	14.13	4879	55	4824	RF
PL	2016	Corn	GroupC-0128	2.28	0.00	1.84	0.14	25.97	3956	978	2978	RF
PL	2017	Corn	GroupC-0129	2.73	0.16	2.27	0.14	26.29	3955	979	2976	RF
PL	2018	Corn	GroupC-0130	3.68	0.08	3.18	0.14	54.08	3960	974	2986	RF
PL	2020	Corn	GroupC-0131	1.71	0.05	1.39	0.14	18.66	3958	976	2982	RF
PLB	2013	Corn	GroupC-0132	1.75	0.05	1.44	0.06	17.76	2013	503	1510	RF
PLB	2016	Corn	GroupC-0133	3.46	0.00	2.91	0.06	41.68	2015	501	1514	RF
PLB	2017	Corn	GroupC-0134	4.22	0.30	3.81	0.06	44.03	2008	508	1500	RF
PLB	2018	Corn	GroupC-0135	4.27	0.38	3.81	0.06	76.10	2010	506	1504	RF
PLB	2020	Corn	GroupC-0136	1.50	0.24	1.18	0.06	16.17	2018	498	1520	RF
BG	2016	Corn	GroupC-0137	2.19	0.13	1.64	0.23	25.39	5705	1426	4279	RF
BG	2017	Corn	GroupC-0138	2.07	0.41	1.54	0.23	22.07	5705	1426	4279	RF
BG	2018	Corn	GroupC-0139	2.47	0.49	1.93	0.22	31.96	5710	1421	4289	RF
BG	2019	Corn	GroupC-0140	2.00	0.29	1.52	0.22	26.74	5703	1428	4275	RF
BG	2021	Corn	GroupC-0141	2.60	0.36	2.15	0.23	25.01	5701	1430	4271	RF
BBEA	2016	Corn	GroupC-0142	2.01	0.16	1.57	0.56	24.81	12032	3066	8966	RF
BBEA	2017	Corn	GroupC-0143	3.14	0.34	2.61	0.59	29.47	12209	2889	9320	RF
BBEA	2018	Corn	GroupC-0144	2.81	0.46	2.22	0.57	36.14	12051	3047	9004	RF
BBEA	2019	Corn	GroupC-0145	1.80	0.34	1.36	0.56	24.97	12031	3067	8964	RF
BBEA	2021	Corn	GroupC-0146	2.39	0.23	1.81	0.58	25.10	12069	3029	9040	RF
AA	2015	Corn	GroupC-0147	1.88	0.46	1.44	0.77	16.05	15770	3961	11809	RF
AA	2016	Corn	GroupC-0148	2.72	0.24	2.24	0.77	27.89	15758	3973	11785	RF
AA	2017	Corn	GroupC-0149	2.28	0.42	1.81	0.78	18.32	15871	3860	12011	RF
AA	2018	Corn	GroupC-0150	2.59	0.46	1.96	0.78	23.07	15756	3975	11781	RF
AA	2020	Corn	GroupC-0151	2.09	0.36	1.60	0.78	16.56	15769	3962	11807	RF
CS	2014	Corn	GroupC-0152	1.97	0.39	1.58	0.67	16.94	14578	2428	12150	RF
CS	2015	Corn	GroupC-0153	3.35	0.56	3.02	0.68	38.32	14555	2451	12104	RF
CS	2016	Corn	GroupC-0154	3.35	0.07	2.69	0.68	37.21	14566	2440	12126	RF
CS	2017	Corn	GroupC-0155	2.90	0.08	2.21	0.67	23.92	14633	2373	12260	RF
CS	2018	Corn	GroupC-0156	2.36	0.45	1.85	0.67	20.58	14569	2437	12132	RF
CS	2019	Corn	GroupC-0157	2.42	0.39	2.01	0.66	22.19	14566	2440	12126	RF
CS	2021	Corn	GroupC-0158	2.90	0.51	2.65	0.67	20.40	14569	2437	12132	RF
JL	2017	Corn	GroupC-0159	3.82	0.59	3.53	0.05	30.11	1790	862	928	RF
JL	2018	Corn	GroupC-0160	3.93	0.63	3.52	0.05	46.98	1751	901	850	RF
JL	2020	Corn	GroupC-0161	1.75	0.57	1.36	0.05	15.97	1763	889	874	RF
SP	2016	Corn	GroupC-0162	3.10	0.26	2.65	0.30	35.51	7754	1988	5766	RF
SP	2017	Corn	GroupC-0163	2.66	0.37	2.24	0.32	21.09	7943	1799	6144	RF
SP	2018	Corn	GroupC-0164	2.49	0.56	2.05	0.30	24.25	7754	1988	5766	RF
SP	2019	Corn	GroupC-0165	1.91	0.61	1.57	0.30	18.23	7753	1989	5764	RF
SP	2021	Corn	GroupC-0166	2.53	0.38	2.03	0.31	19.12	7764	1978	5786	RF
1P	2018	Corn	GroupC-0167	3.13	0.33	2.56	0.02	30.32	770	770	0	RF
1P	2020	Corn	GroupC-0168	2.92	0.33	2.45	0.02	23.07	770	770	0	RF

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
2PB	2018	Corn	GroupC-0169	2.85	0.15	2.17	0.06	26.78	1769	1764	5	RF
2PB	2020	Corn	GroupC-0170	2.70	0.13	2.07	0.06	22.54	1764	1769	-5	RF
BS	2012	Corn	GroupC-0171	3.20	0.03	2.61	0.07	45.20	2151	656	1495	RF
BS	2017	Corn	GroupC-0172	3.02	0.04	2.46	0.06	32.84	2050	757	1293	RF
BS	2019	Corn	GroupC-0173	3.44	0.03	2.95	0.06	35.99	2058	749	1309	RF
BS	2021	Corn	GroupC-0174	2.69	0.13	2.04	0.07	32.87	2162	645	1517	RF
RD	2012	Corn	GroupC-0175	4.84	0.09	4.25	0.13	92.48	3779	1245	2534	RF
RD	2015	Corn	GroupC-0176	1.45	0.30	1.15	0.13	16.62	3763	1261	2502	RF
RD	2017	Corn	GroupC-0177	4.01	0.06	3.54	0.13	33.41	3763	1261	2502	RF
RD	2019	Corn	GroupC-0178	3.19	0.17	2.75	0.13	31.94	3767	1257	2510	RF
6	2013	Soybeans	GroupC-0001	0.46	0.33	0.34	0.02	12.21	994	249	745	SVM
6	2014	Soybeans	GroupC-0002	1.08	0.10	0.99	0.02	24.71	993	250	743	SVM
6	2015	Soybeans	GroupC-0003	1.39	0.30	1.32	0.02	52.63	992	251	741	SVM
6	2020	Soybeans	GroupC-0004	0.51	0.24	0.39	0.02	13.89	996	247	749	SVM
6	2021	Soybeans	GroupC-0005	0.74	0.16	0.59	0.02	19.28	997	246	751	SVM
AM	2013	Soybeans	GroupC-0006	1.17	0.34	1.00	3.50	36.27	6681	1748	4933	SVM
AM	2014	Soybeans	GroupC-0007	1.57	0.37	1.45	3.37	40.03	6681	1748	4933	SVM
AM	2015	Soybeans	GroupC-0008	1.75	0.18	1.67	4.53	84.63	6962	1467	5495	SVM
AM	2019	Soybeans	GroupC-0009	0.70	0.37	0.54	6.89	25.23	7684	745	6939	SVM
AM	2020	Soybeans	GroupC-0010	1.01	0.12	0.81	6.21	23.57	7438	991	6447	SVM
AM	2021	Soybeans	GroupC-0011	1.09	0.08	0.79	3.97	30.88	6699	1730	4969	SVM
CF	2012	Soybeans	GroupC-0012	0.75	0.11	0.60	0.35	19.72	4365	1099	3266	SVM
CF	2015	Soybeans	GroupC-0013	0.74	0.23	0.62	0.34	22.09	4367	1097	3270	SVM
CF	2016	Soybeans	GroupC-0014	0.51	0.29	0.37	0.37	14.59	4381	1083	3298	SVM
CF	2019	Soybeans	GroupC-0015	0.60	0.18	0.47	0.36	17.30	4369	1095	3274	SVM
CF	2021	Soybeans	GroupC-0016	1.43	0.06	1.26	0.35	32.22	4374	1090	3284	SVM
HB	2013	Soybeans	GroupC-0017	0.95	0.06	0.79	0.12	33.67	2561	558	2003	SVM
HB	2014	Soybeans	GroupC-0018	1.24	0.27	1.09	0.11	40.48	2564	555	2009	SVM
HB	2016	Soybeans	GroupC-0020	1.35	0.27	1.19	0.17	56.45	2938	181	2757	SVM
HB	2018	Soybeans	GroupC-0021	1.18	0.07	1.03	0.16	33.11	2935	184	2751	SVM
HB	2019	Soybeans	GroupC-0022	0.89	0.41	0.73	0.17	47.44	2945	174	2771	SVM
HB	2020	Soybeans	GroupC-0023	0.98	0.04	0.85	0.12	30.40	2564	555	2009	SVM
HB	2021	Soybeans	GroupC-0024	0.70	0.08	0.56	0.15	19.21	2756	363	2393	SVM
NH	2013	Soybeans	GroupC-0025	1.00	0.65	0.76	0.01	40.02	232	173	59	SVM
NH	2020	Soybeans	GroupC-0026	1.29	0.55	1.07	0.00	39.66	224	181	43	SVM
NH	2021	Soybeans	GroupC-0027	1.36	0.09	1.08	0.01	53.55	354	51	303	SVM
PB	2012	Soybeans	GroupC-0028	1.55	0.42	1.39	0.06	48.63	1843	335	1508	SVM
PB	2014	Soybeans	GroupC-0029	1.30	0.27	1.10	0.06	37.40	1844	334	1510	SVM
PB	2015	Soybeans	GroupC-0030	1.06	0.48	0.92	0.06	52.62	1851	327	1524	SVM
PB	2016	Soybeans	GroupC-0031	0.96	0.41	0.78	0.06	36.79	1847	331	1516	SVM
PB	2018	Soybeans	GroupC-0032	1.28	0.13	1.07	0.06	44.61	1851	327	1524	SVM
PB	2019	Soybeans	GroupC-0033	1.06	0.25	0.80	0.06	52.49	1900	278	1622	SVM
PB	2021	Soybeans	GroupC-0034	1.71	0.01	1.49	0.07	61.05	1932	246	1686	SVM
PE	2018	Soybeans	GroupC-0035	0.94	0.06	0.68	0.06	20.28	1880	941	939	SVM
PE	2019	Soybeans	GroupC-0036	1.22	0.02	1.03	0.07	34.74	1879	942	937	SVM
PE	2021	Soybeans	GroupC-0037	1.11	0.08	0.87	0.06	23.62	1883	938	945	SVM
PW	2018	Soybeans	GroupC-0038	0.74	0.08	0.59	0.01	16.11	505	257	248	SVM
PW	2019	Soybeans	GroupC-0039	1.11	0.02	0.99	0.01	30.84	503	259	244	SVM
PW	2021	Soybeans	GroupC-0040	0.70	0.06	0.58	0.01	15.91	516	246	270	SVM
PTB	2013	Soybeans	GroupC-0041	1.06	0.14	0.90	0.07	29.06	1971	289	1682	SVM
PTB	2014	Soybeans	GroupC-0042	0.84	0.29	0.61	0.07	25.12	1961	299	1662	SVM
PTB	2015	Soybeans	GroupC-0043	1.00	0.10	0.84	0.07	57.03	1957	303	1654	SVM
PTB	2016	Soybeans	GroupC-0044	0.43	0.30	0.30	0.07	14.74	1963	297	1666	SVM

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PTB	2018	Soybeans	GroupC-0045	1.28	0.21	1.15	0.07	31.93	1971	289	1682	SVM
PTB	2019	Soybeans	GroupC-0046	0.78	0.35	0.57	0.07	55.02	1990	270	1720	SVM
PTB	2020	Soybeans	GroupC-0047	1.00	0.31	0.88	0.07	54.00	1998	262	1736	SVM
PTB	2021	Soybeans	GroupC-0048	0.60	0.47	0.47	0.07	31.10	2009	251	1758	SVM
PL	2012	Soybeans	GroupC-0049	1.09	0.00	0.89	0.26	30.15	3825	855	2970	SVM
PL	2014	Soybeans	GroupC-0050	0.71	0.17	0.57	0.24	18.02	3706	974	2732	SVM
PL	2015	Soybeans	GroupC-0051	1.18	0.16	1.04	0.27	40.28	3775	905	2870	SVM
PL	2019	Soybeans	GroupC-0052	0.68	0.17	0.54	0.25	21.20	3712	968	2744	SVM
PL	2021	Soybeans	GroupC-0053	1.39	0.10	1.22	0.24	30.12	3702	978	2724	SVM
PLB	2012	Soybeans	GroupC-0054	1.37	0.02	1.21	0.07	38.52	1992	502	1490	SVM
PLB	2014	Soybeans	GroupC-0055	0.84	0.47	0.70	0.07	22.13	1994	500	1494	SVM
PLB	2015	Soybeans	GroupC-0056	1.50	0.55	1.41	0.07	66.04	1995	499	1496	SVM
PLB	2019	Soybeans	GroupC-0057	1.00	0.45	0.74	0.07	35.49	1992	502	1490	SVM
PLB	2021	Soybeans	GroupC-0058	1.33	0.24	1.18	0.07	32.15	2003	491	1512	SVM
BG	2013	Soybeans	GroupC-0059	0.99	0.22	0.77	0.37	28.30	4258	1438	2820	SVM
BG	2014	Soybeans	GroupC-0060	1.17	0.17	0.96	0.31	67.01	4258	1438	2820	SVM
BG	2020	Soybeans	GroupC-0062	0.98	0.13	0.76	0.38	26.14	4260	1436	2824	SVM
BBEA	2013	Soybeans	GroupC-0063	0.99	0.10	0.75	13.04	35.76	8931	3081	5850	SVM
BBEA	2014	Soybeans	GroupC-0064	1.05	0.04	0.84	9.47	58.09	8928	3084	5844	SVM
BBEA	2020	Soybeans	GroupC-0066	1.26	0.03	1.01	13.35	37.35	8976	3036	5940	SVM
AA	2014	Soybeans	GroupC-0068	2.97	0.01	2.77	7.96	75.89	8320	3968	4352	SVM
AA	2019	Soybeans	GroupC-0069	0.99	0.24	0.84	8.71	25.95	8312	3976	4336	SVM
AA	2021	Soybeans	GroupC-0070	3.09	0.01	2.96	8.20	66.83	8322	3966	4356	SVM
CS	2012	Soybeans	GroupC-0071	1.50	0.02	1.26	0.63	41.18	4877	1942	2935	SVM
CS	2013	Soybeans	GroupC-0072	2.44	0.19	2.28	0.34	98.86	4379	2440	1939	SVM
CS	2020	Soybeans	GroupC-0073	2.46	0.16	2.32	0.35	51.21	4382	2437	1945	SVM
JL	2021	Soybeans	GroupC-0075	2.51	0.09	2.42	0.01	55.21	888	884	4	SVM
SP	2012	Soybeans	GroupC-0076	1.56	0.13	1.36	8.44	64.53	7960	1929	6031	SVM
SP	2020	Soybeans	GroupC-0080	3.72	0.03	3.67	7.70	85.75	7905	1984	5921	SVM
1P	2019	Soybeans	GroupC-0081	1.52	0.14	1.28	0.01	43.62	770	770	0	SVM
1P	2021	Soybeans	GroupC-0082	1.65	0.11	1.55	0.01	34.51	770	770	0	SVM
2PB	2019	Soybeans	GroupC-0083	1.02	0.03	0.80	0.05	28.08	1771	1767	4	SVM
2PB	2021	Soybeans	GroupC-0084	0.94	0.02	0.78	0.06	22.11	1767	1771	-4	SVM
BS	2013	Soybeans	GroupC-0085	0.70	0.40	0.53	0.25	22.04	3555	656	2899	SVM
BS	2014	Soybeans	GroupC-0086	0.78	0.56	0.58	0.24	32.55	3555	656	2899	SVM
BS	2016	Soybeans	GroupC-0088	0.78	0.39	0.64	0.26	30.89	3556	655	2901	SVM
BS	2018	Soybeans	GroupC-0089	1.38	0.31	1.21	0.23	36.41	3459	752	2707	SVM
BS	2020	Soybeans	GroupC-0090	1.18	0.35	1.06	0.24	34.80	3463	748	2715	SVM
RD	2013	Soybeans	GroupC-0092	1.07	0.24	0.74	2.19	29.67	6279	1256	5023	SVM
RD	2014	Soybeans	GroupC-0093	1.40	0.29	1.18	2.24	30.77	6276	1259	5017	SVM
RD	2016	Soybeans	GroupC-0094	1.60	0.13	1.37	2.48	51.55	6281	1254	5027	SVM
RD	2018	Soybeans	GroupC-0095	0.88	0.40	0.67	2.39	20.83	6282	1253	5029	SVM
RD	2020	Soybeans	GroupC-0096	0.93	0.19	0.69	2.67	25.62	6281	1254	5027	SVM
RD	2021	Soybeans	GroupC-0097	1.03	0.26	0.81	2.62	26.95	6276	1259	5017	SVM
6	2016	Corn	GroupC-0098	2.16	0.09	1.94	0.01	23.96	738	249	489	SVM
6	2017	Corn	GroupC-0099	5.03	0.41	4.74	0.01	41.58	739	248	491	SVM
6	2018	Corn	GroupC-0100	3.37	0.42	2.97	0.01	42.74	743	244	499	SVM
6	2019	Corn	GroupC-0101	2.42	0.00	2.16	0.01	36.57	741	246	495	SVM
AM	2015	Corn	GroupC-0102	2.81	0.07	2.49	3.13	39.39	6966	276	6690	SVM
AM	2016	Corn	GroupC-0103	2.71	0.03	2.32	0.96	30.63	5483	1759	3724	SVM
AM	2017	Corn	GroupC-0104	4.71	0.36	4.41	0.99	39.13	5496	1746	3750	SVM
AM	2018	Corn	GroupC-0105	2.23	0.27	1.65	1.02	28.09	5515	1727	3788	SVM
AM	2019	Corn	GroupC-0106	1.85	0.02	1.58	2.08	29.11	6250	992	5258	SVM

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
AM	2020	Corn	GroupC-0107	2.04	0.04	1.64	2.35	26.38	6500	742	5758	SVM
CF	2013	Corn	GroupC-0108	1.34	0.08	1.04	0.32	15.09	4378	1093	3285	SVM
CF	2014	Corn	GroupC-0109	4.41	0.02	3.82	0.33	36.57	4385	1086	3299	SVM
CF	2017	Corn	GroupC-0110	4.24	0.09	3.93	0.32	38.75	4372	1099	3273	SVM
CF	2018	Corn	GroupC-0111	3.50	0.05	3.04	0.32	47.02	4373	1098	3275	SVM
CF	2020	Corn	GroupC-0112	1.39	0.10	1.05	0.31	16.60	4376	1095	3281	SVM
HB	2016	Corn	GroupC-0113	4.34	0.05	4.03	0.03	47.41	1285	366	919	SVM
HB	2017	Corn	GroupC-0114	4.97	0.22	4.48	0.02	52.76	1094	557	537	SVM
HB	2018	Corn	GroupC-0115	5.05	0.51	4.70	0.03	88.86	1288	363	925	SVM
HB	2019	Corn	GroupC-0116	2.64	0.50	2.20	0.03	43.17	1286	365	921	SVM
NH	2014	Corn	GroupC-0117	3.94	0.03	3.70	0.02	37.86	1106	223	883	SVM
NH	2015	Corn	GroupC-0118	1.36	0.01	1.16	0.02	19.48	1108	221	887	SVM
NH	2016	Corn	GroupC-0119	1.50	0.03	1.22	0.02	19.57	1107	222	885	SVM
NH	2017	Corn	GroupC-0120	4.49	0.44	4.26	0.02	43.38	1103	226	877	SVM
NH	2018	Corn	GroupC-0121	4.34	0.22	3.96	0.02	69.14	1107	222	885	SVM
NH	2019	Corn	GroupC-0122	1.87	0.07	1.36	0.02	24.93	1114	215	899	SVM
PB	2013	Corn	GroupC-0123	1.91	0.27	1.54	0.01	17.35	671	327	344	SVM
PB	2017	Corn	GroupC-0124	3.48	0.29	3.14	0.01	26.68	660	338	322	SVM
PB	2020	Corn	GroupC-0125	1.82	0.21	1.43	0.01	16.64	665	333	332	SVM
PL	2013	Corn	GroupC-0126	2.17	0.08	1.85	0.26	21.41	3962	972	2990	SVM
PL	2015	Corn	GroupC-0127	0.79	0.41	0.56	0.46	9.90	4879	55	4824	SVM
PL	2016	Corn	GroupC-0128	2.03	0.00	1.58	0.25	23.06	3956	978	2978	SVM
PL	2017	Corn	GroupC-0129	3.41	0.07	2.96	0.25	32.76	3955	979	2976	SVM
PL	2018	Corn	GroupC-0130	3.67	0.03	3.15	0.25	53.94	3960	974	2986	SVM
PL	2020	Corn	GroupC-0131	1.71	0.07	1.36	0.25	18.61	3958	976	2982	SVM
PLB	2013	Corn	GroupC-0132	2.36	0.07	2.00	0.07	23.94	2013	503	1510	SVM
PLB	2016	Corn	GroupC-0133	2.26	0.03	1.92	0.07	27.24	2015	501	1514	SVM
PLB	2017	Corn	GroupC-0134	3.46	0.30	3.03	0.07	36.11	2008	508	1500	SVM
PLB	2018	Corn	GroupC-0135	4.36	0.32	3.87	0.07	77.83	2010	506	1504	SVM
PLB	2020	Corn	GroupC-0136	1.53	0.19	1.20	0.07	16.49	2018	498	1520	SVM
BG	2016	Corn	GroupC-0137	3.63	0.03	3.03	0.90	42.13	5705	1426	4279	SVM
BG	2017	Corn	GroupC-0138	2.36	0.38	1.79	0.86	25.17	5705	1426	4279	SVM
BG	2018	Corn	GroupC-0139	3.00	0.43	2.46	1.02	38.79	5710	1421	4289	SVM
BG	2019	Corn	GroupC-0140	2.22	0.33	1.64	1.02	29.62	5703	1428	4275	SVM
BG	2021	Corn	GroupC-0141	3.55	0.31	3.09	0.95	34.22	5701	1430	4271	SVM
BBEA	2016	Corn	GroupC-0142	3.10	0.01	2.41	13.87	38.30	12032	3066	8966	SVM
BBEA	2017	Corn	GroupC-0143	3.37	0.38	2.86	15.21	31.63	12209	2889	9320	SVM
BBEA	2018	Corn	GroupC-0144	2.91	0.37	2.31	14.43	37.45	12051	3047	9004	SVM
BBEA	2019	Corn	GroupC-0145	2.02	0.36	1.57	16.17	28.01	12031	3067	8964	SVM
BBEA	2021	Corn	GroupC-0146	2.94	0.21	2.27	15.07	30.82	12069	3029	9040	SVM
AA	2015	Corn	GroupC-0147	1.48	0.52	1.11	32.40	12.65	15770	3961	11809	SVM
AA	2016	Corn	GroupC-0148	2.41	0.29	1.97	33.40	24.68	15758	3973	11785	SVM
AA	2017	Corn	GroupC-0149	2.38	0.37	1.88	35.37	19.17	15871	3860	12011	SVM
AA	2018	Corn	GroupC-0150	2.46	0.49	1.88	34.70	21.97	15756	3975	11781	SVM
AA	2020	Corn	GroupC-0151	2.44	0.29	1.90	33.96	19.37	15769	3962	11807	SVM
CS	2014	Corn	GroupC-0152	1.94	0.28	1.54	22.88	16.68	14578	2428	12150	SVM
CS	2015	Corn	GroupC-0153	2.24	0.33	1.65	24.69	25.66	14555	2451	12104	SVM
CS	2016	Corn	GroupC-0154	2.67	0.08	2.12	23.91	29.68	14566	2440	12126	SVM
CS	2017	Corn	GroupC-0155	2.22	0.17	1.66	24.18	18.31	14633	2373	12260	SVM
CS	2018	Corn	GroupC-0156	2.43	0.50	1.86	23.65	21.22	14569	2437	12132	SVM
CS	2019	Corn	GroupC-0157	2.83	0.28	2.40	27.46	25.97	14566	2440	12126	SVM
CS	2021	Corn	GroupC-0158	2.78	0.38	2.34	23.48	19.60	14569	2437	12132	SVM
JL	2017	Corn	GroupC-0159	4.49	0.53	4.19	0.05	35.36	1790	862	928	SVM

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
JL	2018	Corn	GroupC-0160	3.88	0.58	3.43	0.05	46.41	1751	901	850	SVM
JL	2020	Corn	GroupC-0161	2.71	0.50	2.39	0.05	24.71	1763	889	874	SVM
SP	2016	Corn	GroupC-0162	2.67	0.19	2.11	3.70	30.61	7754	1988	5766	SVM
SP	2017	Corn	GroupC-0163	2.79	0.36	2.37	4.03	22.13	7943	1799	6144	SVM
SP	2018	Corn	GroupC-0164	2.71	0.52	2.21	3.50	26.35	7754	1988	5766	SVM
SP	2019	Corn	GroupC-0165	2.45	0.41	2.05	4.17	23.36	7753	1989	5764	SVM
SP	2021	Corn	GroupC-0166	3.03	0.36	2.57	3.36	22.81	7764	1978	5786	SVM
1P	2018	Corn	GroupC-0167	3.27	0.30	2.65	0.01	31.69	770	770	0	SVM
1P	2020	Corn	GroupC-0168	2.67	0.32	2.34	0.01	21.15	770	770	0	SVM
2PB	2018	Corn	GroupC-0169	2.92	0.12	2.19	0.05	27.40	1769	1764	5	SVM
2PB	2020	Corn	GroupC-0170	2.43	0.10	1.89	0.05	20.32	1764	1769	-5	SVM
BS	2012	Corn	GroupC-0171	2.96	0.00	2.27	0.07	41.80	2151	656	1495	SVM
BS	2017	Corn	GroupC-0172	3.22	0.02	2.63	0.07	35.07	2050	757	1293	SVM
BS	2019	Corn	GroupC-0173	3.35	0.21	2.96	0.07	35.14	2058	749	1309	SVM
BS	2021	Corn	GroupC-0174	2.80	0.07	2.09	0.07	34.25	2162	645	1517	SVM
RD	2012	Corn	GroupC-0175	4.69	0.09	4.09	0.21	89.54	3779	1245	2534	SVM
RD	2015	Corn	GroupC-0176	1.52	0.19	1.19	0.20	17.40	3763	1261	2502	SVM
RD	2017	Corn	GroupC-0177	4.35	0.05	3.98	0.21	36.25	3763	1261	2502	SVM
RD	2019	Corn	GroupC-0178	3.11	0.15	2.74	0.21	31.17	3767	1257	2510	SVM
6	2013	Soybeans	GroupC-0001	0.54	0.26	0.41	0.00	14.12	498	0	498	ENR
6	2014	Soybeans	GroupC-0002	0.72	0.27	0.64	0.00	16.45	500	0	500	ENR
6	2020	Soybeans	GroupC-0004	0.46	0.31	0.34	0.00	12.33	494	0	494	ENR
6	2021	Soybeans	GroupC-0005	0.72	0.18	0.56	0.00	18.75	492	0	492	ENR
AM	2013	Soybeans	GroupC-0006	1.18	0.19	1.00	0.01	36.37	3496	0	3496	ENR
AM	2014	Soybeans	GroupC-0007	1.30	0.36	1.19	0.01	33.28	3496	0	3496	ENR
AM	2015	Soybeans	GroupC-0008	0.61	0.08	0.49	0.01	29.37	2934	0	2934	ENR
AM	2019	Soybeans	GroupC-0009	1.21	0.24	1.02	0.01	43.91	1490	0	1490	ENR
AM	2020	Soybeans	GroupC-0010	1.04	0.01	0.89	0.01	24.24	1982	0	1982	ENR
AM	2021	Soybeans	GroupC-0011	3.09	0.20	2.95	0.01	87.47	3460	0	3460	ENR
CF	2012	Soybeans	GroupC-0012	0.78	0.03	0.63	0.01	20.43	2198	0	2198	ENR
CF	2015	Soybeans	GroupC-0013	0.77	0.17	0.64	0.01	22.92	2194	0	2194	ENR
CF	2016	Soybeans	GroupC-0014	0.56	0.18	0.45	0.00	15.86	2166	0	2166	ENR
CF	2019	Soybeans	GroupC-0015	0.85	0.07	0.69	0.01	24.64	2190	0	2190	ENR
CF	2021	Soybeans	GroupC-0016	1.66	0.03	1.51	0.01	37.35	2180	0	2180	ENR
HB	2013	Soybeans	GroupC-0017	0.89	0.03	0.72	0.01	31.46	1116	0	1116	ENR
HB	2014	Soybeans	GroupC-0018	1.01	0.05	0.81	0.01	33.00	1110	0	1110	ENR
HB	2016	Soybeans	GroupC-0020	0.64	0.12	0.52	0.00	26.61	362	0	362	ENR
HB	2018	Soybeans	GroupC-0021	0.87	0.09	0.71	0.00	24.20	368	0	368	ENR
HB	2019	Soybeans	GroupC-0022	0.98	0.34	0.79	0.01	51.99	348	0	348	ENR
HB	2020	Soybeans	GroupC-0023	1.20	0.18	1.08	0.01	37.27	1110	0	1110	ENR
HB	2021	Soybeans	GroupC-0024	0.90	0.11	0.77	0.01	24.96	726	0	726	ENR
NH	2013	Soybeans	GroupC-0025	1.20	0.70	1.03	0.00	47.98	346	0	346	ENR
NH	2020	Soybeans	GroupC-0026	1.16	0.67	0.94	0.00	35.61	362	0	362	ENR
PB	2012	Soybeans	GroupC-0028	1.14	0.20	0.97	0.01	35.83	670	0	670	ENR
PB	2014	Soybeans	GroupC-0029	1.23	0.20	1.06	0.01	35.28	668	0	668	ENR
PB	2015	Soybeans	GroupC-0030	0.75	0.44	0.60	0.00	36.98	654	0	654	ENR
PB	2016	Soybeans	GroupC-0031	0.97	0.25	0.83	0.01	37.38	662	0	662	ENR
PB	2018	Soybeans	GroupC-0032	1.41	0.09	1.15	0.01	49.08	654	0	654	ENR
PB	2019	Soybeans	GroupC-0033	1.68	0.34	1.49	0.00	82.78	556	0	556	ENR
PB	2021	Soybeans	GroupC-0034	1.72	0.10	1.40	0.00	61.24	492	0	492	ENR
PE	2018	Soybeans	GroupC-0035	0.93	0.03	0.73	0.01	19.88	1882	0	1882	ENR
PE	2019	Soybeans	GroupC-0036	1.28	0.25	1.13	0.00	36.60	1884	0	1884	ENR
PE	2021	Soybeans	GroupC-0037	1.58	0.40	1.26	0.00	33.60	1876	0	1876	ENR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PW	2018	Soybeans	GroupC-0038	1.02	0.01	0.88	0.00	22.37	514	0	514	ENR
PW	2019	Soybeans	GroupC-0039	1.22	0.04	1.04	0.00	33.78	518	0	518	ENR
PW	2021	Soybeans	GroupC-0040	1.36	0.06	1.20	0.00	30.95	492	0	492	ENR
PTB	2013	Soybeans	GroupC-0041	0.98	0.26	0.87	0.01	26.94	578	0	578	ENR
PTB	2014	Soybeans	GroupC-0042	1.05	0.26	0.93	0.00	31.16	598	0	598	ENR
PTB	2016	Soybeans	GroupC-0044	1.75	0.20	1.68	0.00	60.25	594	0	594	ENR
PTB	2018	Soybeans	GroupC-0045	1.64	0.21	1.53	0.01	40.83	578	0	578	ENR
PTB	2019	Soybeans	GroupC-0046	0.82	0.61	0.64	0.00	57.88	540	0	540	ENR
PTB	2020	Soybeans	GroupC-0047	1.13	0.26	1.00	0.01	61.40	524	0	524	ENR
PTB	2021	Soybeans	GroupC-0048	1.50	0.24	1.35	0.01	77.67	502	0	502	ENR
PL	2012	Soybeans	GroupC-0049	1.25	0.01	1.06	0.00	34.65	1710	0	1710	ENR
PL	2014	Soybeans	GroupC-0050	0.75	0.07	0.55	0.01	18.93	1948	0	1948	ENR
PL	2015	Soybeans	GroupC-0051	1.17	0.21	1.03	0.01	39.82	1810	0	1810	ENR
PL	2019	Soybeans	GroupC-0052	0.90	0.28	0.76	0.00	27.99	1936	0	1936	ENR
PL	2021	Soybeans	GroupC-0053	1.84	0.13	1.71	0.01	39.89	1956	0	1956	ENR
PLB	2012	Soybeans	GroupC-0054	1.44	0.01	1.20	0.00	40.40	1004	0	1004	ENR
PLB	2014	Soybeans	GroupC-0055	0.70	0.45	0.50	0.00	18.53	1000	0	1000	ENR
PLB	2015	Soybeans	GroupC-0056	1.67	0.52	1.59	0.00	73.66	998	0	998	ENR
PLB	2019	Soybeans	GroupC-0057	1.23	0.30	1.00	0.00	43.77	1004	0	1004	ENR
PLB	2021	Soybeans	GroupC-0058	2.54	0.16	2.36	0.00	61.50	982	0	982	ENR
BG	2013	Soybeans	GroupC-0059	0.98	0.16	0.75	0.00	28.19	2876	0	2876	ENR
BG	2014	Soybeans	GroupC-0060	0.78	0.18	0.62	0.00	44.70	2876	0	2876	ENR
BG	2020	Soybeans	GroupC-0062	0.74	0.16	0.60	0.00	19.65	2872	0	2872	ENR
BBEA	2013	Soybeans	GroupC-0063	1.06	0.02	0.84	0.01	38.26	6162	0	6162	ENR
BBEA	2014	Soybeans	GroupC-0064	0.91	0.04	0.76	0.01	50.35	6168	0	6168	ENR
BBEA	2020	Soybeans	GroupC-0066	1.08	0.04	0.91	0.01	31.97	6072	0	6072	ENR
AA	2014	Soybeans	GroupC-0068	3.01	0.10	2.84	0.01	76.84	4682	3254	1428	ENR
AA	2021	Soybeans	GroupC-0070	3.76	0.00	3.67	0.01	81.41	4673	3259	1414	ENR
CS	2013	Soybeans	GroupC-0072	2.38	0.08	2.18	0.00	96.41	3119	1761	1358	ENR
CS	2020	Soybeans	GroupC-0073	2.75	0.15	2.67	0.01	57.30	3112	1762	1350	ENR
JL	2021	Soybeans	GroupC-0075	2.46	0.07	2.37	0.00	54.17	1768	0	1768	ENR
1P	2019	Soybeans	GroupC-0081	1.57	0.08	1.32	0.00	44.82	1062	478	584	ENR
1P	2021	Soybeans	GroupC-0082	1.55	0.04	1.35	0.00	32.31	1062	478	584	ENR
2PB	2019	Soybeans	GroupC-0083	1.17	0.00	0.91	0.00	32.17	2311	1223	1088	ENR
2PB	2021	Soybeans	GroupC-0084	1.15	0.00	0.89	0.00	27.16	2318	1224	1094	ENR
BS	2013	Soybeans	GroupC-0085	0.77	0.33	0.57	0.00	24.28	1312	0	1312	ENR
BS	2014	Soybeans	GroupC-0086	1.35	0.31	1.20	0.00	56.28	1312	0	1312	ENR
BS	2016	Soybeans	GroupC-0088	0.96	0.36	0.84	0.00	38.11	1310	0	1310	ENR
BS	2018	Soybeans	GroupC-0089	1.71	0.23	1.54	0.00	45.06	1504	0	1504	ENR
BS	2020	Soybeans	GroupC-0090	1.46	0.29	1.31	0.00	42.85	1496	0	1496	ENR
RD	2013	Soybeans	GroupC-0092	1.01	0.35	0.73	0.01	27.98	1558	954	604	ENR
RD	2014	Soybeans	GroupC-0093	2.06	0.37	1.91	0.01	45.23	1564	954	610	ENR
RD	2016	Soybeans	GroupC-0094	2.12	0.28	2.00	0.01	68.38	1554	954	600	ENR
RD	2018	Soybeans	GroupC-0095	1.43	0.30	1.24	0.01	33.95	1552	954	598	ENR
RD	2020	Soybeans	GroupC-0096	0.80	0.22	0.62	0.01	22.02	1554	954	600	ENR
RD	2021	Soybeans	GroupC-0097	2.40	0.32	2.20	0.01	62.77	1564	954	610	ENR
6	2016	Corn	GroupC-0098	5.47	0.09	5.29	0.00	60.67	498	0	498	ENR
6	2017	Corn	GroupC-0099	1.83	0.46	1.44	0.00	15.10	496	0	496	ENR
6	2018	Corn	GroupC-0100	4.62	0.34	4.21	0.00	58.62	488	0	488	ENR
6	2019	Corn	GroupC-0101	2.24	0.00	1.96	0.00	33.82	492	0	492	ENR
AM	2015	Corn	GroupC-0102	2.30	0.02	2.03	0.01	32.19	552	0	552	ENR
AM	2016	Corn	GroupC-0103	3.52	0.00	3.29	0.01	39.77	3518	0	3518	ENR
AM	2017	Corn	GroupC-0104	5.06	0.12	4.68	0.01	42.00	3492	0	3492	ENR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
AM	2018	Corn	GroupC-0105	2.11	0.20	1.52	0.01	26.55	3454	0	3454	ENR
AM	2019	Corn	GroupC-0106	1.52	0.05	1.23	0.01	23.95	1984	0	1984	ENR
AM	2020	Corn	GroupC-0107	1.60	0.01	1.19	0.01	20.72	1484	0	1484	ENR
CF	2013	Corn	GroupC-0108	2.34	0.00	2.01	0.01	26.24	2186	0	2186	ENR
CF	2014	Corn	GroupC-0109	5.38	0.00	4.78	0.01	44.61	2172	0	2172	ENR
CF	2017	Corn	GroupC-0110	8.22	0.00	8.03	0.00	75.09	2198	0	2198	ENR
CF	2018	Corn	GroupC-0111	4.88	0.01	4.46	0.01	65.52	2196	0	2196	ENR
CF	2020	Corn	GroupC-0112	2.64	0.13	2.36	0.01	31.37	2190	0	2190	ENR
HB	2016	Corn	GroupC-0113	4.59	0.03	4.27	0.00	50.08	732	0	732	ENR
HB	2017	Corn	GroupC-0114	2.69	0.44	2.18	0.00	28.52	1114	0	1114	ENR
HB	2018	Corn	GroupC-0115	5.00	0.37	4.54	0.00	87.92	726	0	726	ENR
HB	2019	Corn	GroupC-0116	2.66	0.46	2.30	0.00	43.53	730	0	730	ENR
NH	2014	Corn	GroupC-0117	4.38	0.06	4.22	0.00	42.08	446	0	446	ENR
NH	2015	Corn	GroupC-0118	1.34	0.01	1.13	0.00	19.20	442	0	442	ENR
NH	2016	Corn	GroupC-0119	0.98	0.07	0.76	0.00	12.80	444	0	444	ENR
NH	2017	Corn	GroupC-0120	3.81	0.17	3.44	0.00	36.82	452	0	452	ENR
NH	2018	Corn	GroupC-0121	3.72	0.21	3.24	0.00	59.34	444	0	444	ENR
NH	2019	Corn	GroupC-0122	4.01	0.25	3.70	0.00	53.45	430	0	430	ENR
PB	2013	Corn	GroupC-0123	1.97	0.24	1.59	0.00	17.92	654	0	654	ENR
PB	2017	Corn	GroupC-0124	2.79	0.22	2.44	0.00	21.36	676	0	676	ENR
PL	2013	Corn	GroupC-0126	1.25	0.08	0.94	0.00	12.30	1944	0	1944	ENR
PL	2015	Corn	GroupC-0127	1.08	0.24	0.86	0.00	13.51	110	0	110	ENR
PL	2016	Corn	GroupC-0128	1.32	0.00	1.04	0.00	14.95	1956	0	1956	ENR
PL	2017	Corn	GroupC-0129	2.55	0.02	2.09	0.00	24.55	1958	0	1958	ENR
PL	2018	Corn	GroupC-0130	3.41	0.00	2.83	0.00	50.12	1948	0	1948	ENR
PL	2020	Corn	GroupC-0131	1.62	0.00	1.26	0.00	17.60	1952	0	1952	ENR
PLB	2013	Corn	GroupC-0132	1.45	0.01	1.14	0.00	14.72	1006	0	1006	ENR
PLB	2016	Corn	GroupC-0133	4.72	0.01	4.48	0.00	56.84	1002	0	1002	ENR
PLB	2017	Corn	GroupC-0134	7.77	0.15	7.54	0.00	81.13	1016	0	1016	ENR
PLB	2018	Corn	GroupC-0135	4.27	0.26	3.70	0.00	76.10	1012	0	1012	ENR
PLB	2020	Corn	GroupC-0136	1.65	0.19	1.25	0.00	17.81	996	0	996	ENR
BG	2016	Corn	GroupC-0137	4.06	0.02	3.65	0.01	47.11	2852	0	2852	ENR
BG	2017	Corn	GroupC-0138	3.28	0.21	2.71	0.01	35.01	2852	0	2852	ENR
BG	2018	Corn	GroupC-0139	2.95	0.25	2.31	0.01	38.18	2842	0	2842	ENR
BG	2019	Corn	GroupC-0140	2.28	0.09	1.76	0.01	30.45	2856	0	2856	ENR
BG	2021	Corn	GroupC-0141	3.99	0.23	3.65	0.01	38.42	2860	0	2860	ENR
BBEA	2016	Corn	GroupC-0142	3.06	0.01	2.60	0.01	37.90	6132	0	6132	ENR
BBEA	2017	Corn	GroupC-0143	3.94	0.09	3.42	0.01	36.94	5778	0	5778	ENR
BBEA	2018	Corn	GroupC-0144	3.16	0.20	2.45	0.01	40.73	6094	0	6094	ENR
BBEA	2019	Corn	GroupC-0145	3.14	0.08	2.67	0.01	43.60	6134	0	6134	ENR
BBEA	2021	Corn	GroupC-0146	3.09	0.15	2.67	0.01	32.46	6058	0	6058	ENR
AA	2015	Corn	GroupC-0147	1.81	0.33	1.47	0.01	15.42	4668	3254	1414	ENR
AA	2016	Corn	GroupC-0148	2.31	0.05	1.79	0.01	23.70	4688	3258	1430	ENR
AA	2017	Corn	GroupC-0149	2.73	0.13	2.21	0.01	21.98	4544	3176	1368	ENR
AA	2018	Corn	GroupC-0150	2.93	0.30	2.24	0.01	26.13	4690	3260	1430	ENR
AA	2020	Corn	GroupC-0151	1.96	0.10	1.57	0.01	15.54	4671	3253	1418	ENR
CS	2014	Corn	GroupC-0152	1.67	0.33	1.25	0.01	14.36	3099	1757	1342	ENR
CS	2015	Corn	GroupC-0153	2.36	0.40	1.80	0.01	26.97	3137	1765	1372	ENR
CS	2016	Corn	GroupC-0154	2.72	0.03	2.23	0.01	30.28	3118	1762	1356	ENR
CS	2017	Corn	GroupC-0155	2.46	0.02	1.86	0.01	20.26	3021	1725	1296	ENR
CS	2018	Corn	GroupC-0156	2.57	0.30	2.05	0.01	22.40	3112	1762	1350	ENR
CS	2019	Corn	GroupC-0157	2.63	0.33	2.23	0.01	24.20	3117	1763	1354	ENR
CS	2021	Corn	GroupC-0158	1.70	0.36	1.37	0.01	11.96	3113	1761	1352	ENR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
JL	2018	Corn	GroupC-0160	3.56	0.34	2.89	0.00	42.62	1802	0	1802	ENR
JL	2020	Corn	GroupC-0161	2.15	0.27	1.69	0.00	19.64	1778	0	1778	ENR
SP	2016	Corn	GroupC-0162	2.84	0.20	2.35	0.01	32.53	2893	1083	1810	ENR
SP	2017	Corn	GroupC-0163	4.56	0.22	4.03	0.01	36.22	2533	1065	1468	ENR
SP	2018	Corn	GroupC-0164	2.57	0.41	2.02	0.01	24.99	2893	1083	1810	ENR
SP	2019	Corn	GroupC-0165	2.08	0.46	1.59	0.01	19.80	2894	1084	1810	ENR
SP	2021	Corn	GroupC-0166	2.42	0.27	1.99	0.01	18.23	2872	1084	1788	ENR
1P	2018	Corn	GroupC-0167	3.20	0.28	2.55	0.00	31.04	1062	478	584	ENR
1P	2020	Corn	GroupC-0168	2.80	0.28	2.43	0.00	22.12	1062	478	584	ENR
2PB	2018	Corn	GroupC-0169	2.94	0.07	2.21	0.01	27.60	2305	1223	1082	ENR
2PB	2020	Corn	GroupC-0170	2.60	0.03	2.04	0.00	21.74	2315	1223	1092	ENR
BS	2012	Corn	GroupC-0171	3.73	0.00	3.18	0.00	52.70	1312	0	1312	ENR
BS	2017	Corn	GroupC-0172	3.37	0.00	2.84	0.00	36.71	1514	0	1514	ENR
BS	2019	Corn	GroupC-0173	4.92	0.08	4.43	0.01	51.58	1498	0	1498	ENR
BS	2021	Corn	GroupC-0174	4.36	0.10	3.73	0.00	53.29	1290	0	1290	ENR
RD	2012	Corn	GroupC-0175	4.99	0.04	4.40	0.00	95.25	1551	939	612	ENR
RD	2015	Corn	GroupC-0176	1.64	0.14	1.25	0.01	18.86	1568	954	614	ENR
RD	2017	Corn	GroupC-0177	3.28	0.02	2.80	0.00	27.31	1568	954	614	ENR
RD	2019	Corn	GroupC-0178	5.41	0.13	5.06	0.01	54.21	1560	954	606	ENR
6	2013	Soybeans	GroupC-0001	0.42	0.28	0.33	0.51	10.94	994	249	745	SR
6	2014	Soybeans	GroupC-0002	1.59	0.28	1.51	0.50	36.34	993	250	743	SR
6	2020	Soybeans	GroupC-0004	0.46	0.34	0.34	0.73	12.28	996	247	749	SR
6	2021	Soybeans	GroupC-0005	1.05	0.18	0.91	0.51	27.12	997	246	751	SR
AM	2013	Soybeans	GroupC-0006	1.18	0.20	1.00	3.85	36.45	6681	1748	4933	SR
AM	2020	Soybeans	GroupC-0010	1.03	0.01	0.87	3.98	24.07	7438	991	6447	SR
CF	2012	Soybeans	GroupC-0012	0.56	0.03	0.47	2.44	14.74	4365	1099	3266	SR
CF	2015	Soybeans	GroupC-0013	0.45	0.18	0.36	2.36	13.48	4367	1097	3270	SR
CF	2016	Soybeans	GroupC-0014	0.56	0.18	0.45	2.38	15.96	4381	1083	3298	SR
CF	2019	Soybeans	GroupC-0015	0.56	0.08	0.45	2.37	16.27	4369	1095	3274	SR
CF	2021	Soybeans	GroupC-0016	0.80	0.03	0.64	2.44	18.03	4374	1090	3284	SR
HB	2013	Soybeans	GroupC-0017	0.83	0.04	0.66	1.47	29.16	2561	558	2003	SR
HB	2014	Soybeans	GroupC-0018	1.69	0.08	1.45	1.36	55.27	2564	555	2009	SR
HB	2020	Soybeans	GroupC-0023	1.65	0.18	1.43	1.34	51.23	2564	555	2009	SR
NH	2013	Soybeans	GroupC-0025	1.21	0.70	1.04	0.13	48.30	232	173	59	SR
NH	2020	Soybeans	GroupC-0026	1.16	0.66	0.95	0.13	35.84	224	181	43	SR
PB	2012	Soybeans	GroupC-0028	1.64	0.20	1.42	0.98	51.28	1843	335	1508	SR
PB	2014	Soybeans	GroupC-0029	0.95	0.21	0.73	0.96	27.18	1844	334	1510	SR
PB	2015	Soybeans	GroupC-0030	0.58	0.45	0.46	1.07	28.76	1851	327	1524	SR
PB	2016	Soybeans	GroupC-0031	0.90	0.25	0.77	0.96	34.64	1847	331	1516	SR
PB	2018	Soybeans	GroupC-0032	1.23	0.09	0.98	1.07	42.73	1851	327	1524	SR
PB	2019	Soybeans	GroupC-0033	1.01	0.34	0.88	0.98	49.84	1900	278	1622	SR
PB	2021	Soybeans	GroupC-0034	1.58	0.11	1.35	1.01	56.49	1932	246	1686	SR
PE	2018	Soybeans	GroupC-0035	1.20	0.03	1.00	1.01	25.74	1880	941	939	SR
PE	2019	Soybeans	GroupC-0036	1.29	0.24	1.14	1.01	36.88	1879	942	937	SR
PE	2021	Soybeans	GroupC-0037	4.02	0.39	3.90	1.02	85.30	1883	938	945	SR
PW	2018	Soybeans	GroupC-0038	1.05	0.00	0.90	0.05	22.86	505	257	248	SR
PW	2019	Soybeans	GroupC-0039	1.24	0.01	1.04	0.27	34.17	503	259	244	SR
PW	2021	Soybeans	GroupC-0040	3.57	0.07	3.50	0.28	81.25	516	246	270	SR
PTB	2013	Soybeans	GroupC-0041	0.81	0.26	0.69	1.01	22.27	1971	289	1682	SR
PTB	2014	Soybeans	GroupC-0042	1.52	0.26	1.38	1.02	45.27	1961	299	1662	SR
PTB	2020	Soybeans	GroupC-0047	1.32	0.27	1.20	1.02	71.32	1998	262	1736	SR
PL	2012	Soybeans	GroupC-0049	0.76	0.01	0.59	2.09	21.19	3825	855	2970	SR
PL	2014	Soybeans	GroupC-0050	0.71	0.07	0.53	2.01	17.87	3706	974	2732	SR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PL	2015	Soybeans	GroupC-0051	0.64	0.20	0.49	2.05	21.75	3775	905	2870	SR
PL	2019	Soybeans	GroupC-0052	0.53	0.27	0.42	2.14	16.59	3712	968	2744	SR
PL	2021	Soybeans	GroupC-0053	0.95	0.13	0.69	1.99	20.61	3702	978	2724	SR
PLB	2012	Soybeans	GroupC-0054	1.29	0.02	1.03	1.48	36.19	1992	502	1490	SR
PLB	2014	Soybeans	GroupC-0055	1.03	0.44	0.82	1.05	27.30	1994	500	1494	SR
PLB	2015	Soybeans	GroupC-0056	0.59	0.53	0.43	1.06	26.07	1995	499	1496	SR
PLB	2019	Soybeans	GroupC-0057	0.86	0.29	0.71	1.46	30.66	1992	502	1490	SR
PLB	2021	Soybeans	GroupC-0058	3.43	0.15	3.24	1.07	82.97	2003	491	1512	SR
BG	2013	Soybeans	GroupC-0059	1.56	0.17	1.37	2.38	44.75	4258	1438	2820	SR
BG	2014	Soybeans	GroupC-0060	1.55	0.18	1.43	2.35	88.27	4258	1438	2820	SR
BBEA	2013	Soybeans	GroupC-0063	1.06	0.03	0.84	5.70	38.32	8931	3081	5850	SR
BBEA	2014	Soybeans	GroupC-0064	0.94	0.05	0.75	5.03	51.93	8928	3084	5844	SR
BBEA	2020	Soybeans	GroupC-0066	2.49	0.04	2.32	4.97	73.99	8976	3036	5940	SR
AA	2014	Soybeans	GroupC-0068	2.43	0.09	2.24	6.16	62.04	8320	3968	4352	SR
CS	2013	Soybeans	GroupC-0072	2.34	0.07	2.14	2.39	94.92	4379	2440	1939	SR
CS	2020	Soybeans	GroupC-0073	2.89	0.14	2.81	2.41	60.24	4382	2437	1945	SR
JL	2021	Soybeans	GroupC-0075	2.46	0.07	2.37	0.47	54.19	888	884	4	SR
1P	2019	Soybeans	GroupC-0081	1.56	0.10	1.33	0.40	44.65	770	770	0	SR
1P	2021	Soybeans	GroupC-0082	1.56	0.06	1.35	0.40	32.52	770	770	0	SR
2PB	2019	Soybeans	GroupC-0083	1.17	0.00	0.91	0.96	32.27	1771	1767	4	SR
2PB	2021	Soybeans	GroupC-0084	1.15	0.00	0.89	0.96	27.18	1767	1771	-4	SR
BS	2013	Soybeans	GroupC-0085	0.77	0.33	0.57	2.20	24.34	3555	656	2899	SR
BS	2020	Soybeans	GroupC-0090	0.86	0.29	0.73	1.85	25.30	3463	748	2715	SR
RD	2013	Soybeans	GroupC-0092	0.84	0.35	0.60	3.27	23.17	6279	1256	5023	SR
RD	2014	Soybeans	GroupC-0093	1.42	0.38	1.27	3.39	31.20	6276	1259	5017	SR
RD	2016	Soybeans	GroupC-0094	2.14	0.28	2.03	3.29	68.98	6281	1254	5027	SR
RD	2018	Soybeans	GroupC-0095	1.31	0.30	1.12	3.24	31.07	6282	1253	5029	SR
RD	2020	Soybeans	GroupC-0096	0.79	0.21	0.61	3.49	21.58	6281	1254	5027	SR
RD	2021	Soybeans	GroupC-0097	1.12	0.33	0.84	3.39	29.18	6276	1259	5017	SR
6	2016	Corn	GroupC-0098	5.93	0.10	5.76	0.39	65.75	738	249	489	SR
6	2017	Corn	GroupC-0099	6.75	0.46	6.52	0.38	55.83	739	248	491	SR
6	2018	Corn	GroupC-0100	5.28	0.37	4.94	0.38	67.01	743	244	499	SR
AM	2015	Corn	GroupC-0102	3.20	0.03	2.90	3.74	44.83	6966	276	6690	SR
AM	2016	Corn	GroupC-0103	3.45	0.00	3.21	3.00	39.03	5483	1759	3724	SR
AM	2018	Corn	GroupC-0105	2.65	0.19	2.33	3.01	33.40	5515	1727	3788	SR
AM	2020	Corn	GroupC-0107	2.60	0.02	2.31	3.51	33.66	6500	742	5758	SR
CF	2013	Corn	GroupC-0108	3.20	0.00	2.95	2.36	35.96	4378	1093	3285	SR
CF	2014	Corn	GroupC-0109	4.40	0.00	3.76	2.35	36.41	4385	1086	3299	SR
CF	2020	Corn	GroupC-0112	7.96	0.14	7.86	2.35	94.72	4376	1095	3281	SR
HB	2016	Corn	GroupC-0113	8.10	0.03	7.92	0.67	88.46	1285	366	919	SR
NH	2014	Corn	GroupC-0117	3.07	0.07	2.85	0.55	29.54	1106	223	883	SR
NH	2015	Corn	GroupC-0118	3.87	0.01	3.64	0.56	55.28	1108	221	887	SR
NH	2016	Corn	GroupC-0119	3.81	0.06	3.67	0.56	49.71	1107	222	885	SR
NH	2018	Corn	GroupC-0121	4.35	0.32	3.98	0.56	69.32	1107	222	885	SR
PB	2013	Corn	GroupC-0123	1.95	0.23	1.49	0.36	17.75	671	327	344	SR
PB	2017	Corn	GroupC-0124	2.79	0.21	2.42	0.35	21.34	660	338	322	SR
PB	2020	Corn	GroupC-0125	1.78	0.19	1.42	0.25	16.29	665	333	332	SR
PL	2013	Corn	GroupC-0126	1.38	0.06	1.15	2.12	13.63	3962	972	2990	SR
PL	2016	Corn	GroupC-0128	5.43	0.00	5.32	2.15	61.72	3956	978	2978	SR
PL	2018	Corn	GroupC-0130	3.71	0.00	3.12	2.14	54.52	3960	974	2986	SR
PL	2020	Corn	GroupC-0131	1.70	0.00	1.39	2.11	18.50	3958	976	2982	SR
PLB	2013	Corn	GroupC-0132	1.48	0.01	1.17	1.05	14.99	2013	503	1510	SR
PLB	2016	Corn	GroupC-0133	1.55	0.02	1.29	1.06	18.68	2015	501	1514	SR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs[Val]	Dif. Obs.	Model
PLB	2017	Corn	GroupC-0134	8.42	0.13	8.21	1.08	87.97	2008	508	1500	SR
PLB	2018	Corn	GroupC-0135	2.25	0.25	1.86	1.06	40.19	2010	506	1504	SR
PLB	2020	Corn	GroupC-0136	1.50	0.18	1.16	1.08	16.21	2018	498	1520	SR
BG	2016	Corn	GroupC-0137	4.15	0.02	3.74	3.10	48.10	5705	1426	4279	SR
BG	2018	Corn	GroupC-0139	2.79	0.25	2.16	3.07	36.07	5710	1421	4289	SR
BG	2021	Corn	GroupC-0141	3.93	0.24	3.60	3.11	37.88	5701	1430	4271	SR
BBEA	2016	Corn	GroupC-0142	2.85	0.01	2.39	8.92	35.28	12032	3066	8966	SR
BBEA	2018	Corn	GroupC-0144	2.63	0.20	2.02	6.61	33.82	12051	3047	9004	SR
BBEA	2019	Corn	GroupC-0145	6.30	0.08	5.97	8.64	87.44	12031	3067	8964	SR
BBEA	2021	Corn	GroupC-0146	3.09	0.15	2.66	6.75	32.46	12069	3029	9040	SR
AA	2015	Corn	GroupC-0147	3.49	0.32	3.20	8.60	29.76	15770	3961	11809	SR
AA	2016	Corn	GroupC-0148	4.43	0.05	3.84	8.49	45.39	15758	3973	11785	SR
AA	2018	Corn	GroupC-0150	3.87	0.30	2.97	8.60	34.48	15756	3975	11781	SR
AA	2020	Corn	GroupC-0151	3.21	0.11	2.77	8.74	25.48	15769	3962	11807	SR
CS	2014	Corn	GroupC-0152	1.62	0.33	1.25	8.72	13.87	14578	2428	12150	SR
CS	2015	Corn	GroupC-0153	1.77	0.40	1.41	7.80	20.20	14555	2451	12104	SR
CS	2016	Corn	GroupC-0154	2.70	0.03	2.17	7.74	30.03	14566	2440	12126	SR
CS	2017	Corn	GroupC-0155	2.23	0.03	1.78	7.75	18.39	14633	2373	12260	SR
CS	2018	Corn	GroupC-0156	2.52	0.30	2.07	7.84	21.98	14569	2437	12132	SR
CS	2019	Corn	GroupC-0157	2.29	0.34	1.91	7.73	21.05	14566	2440	12126	SR
CS	2021	Corn	GroupC-0158	1.55	0.36	1.21	7.85	10.89	14569	2437	12132	SR
JL	2018	Corn	GroupC-0160	3.55	0.35	2.88	0.77	42.52	1751	901	850	SR
JL	2020	Corn	GroupC-0161	3.37	0.27	2.89	0.93	30.74	1763	889	874	SR
SP	2016	Corn	GroupC-0162	3.08	0.20	2.57	4.08	35.24	7754	1988	5766	SR
SP	2018	Corn	GroupC-0164	2.35	0.41	1.82	4.06	22.89	7754	1988	5766	SR
SP	2019	Corn	GroupC-0165	5.50	0.45	5.14	4.23	52.37	7753	1989	5764	SR
SP	2021	Corn	GroupC-0166	2.48	0.28	2.05	4.14	18.72	7764	1978	5786	SR
1P	2018	Corn	GroupC-0167	3.20	0.27	2.56	0.40	31.02	770	770	0	SR
1P	2020	Corn	GroupC-0168	2.81	0.28	2.43	0.40	22.22	770	770	0	SR
2PB	2018	Corn	GroupC-0169	2.95	0.06	2.22	0.97	27.68	1769	1764	5	SR
2PB	2020	Corn	GroupC-0170	2.65	0.03	2.07	1.00	22.11	1764	1769	-5	SR
BS	2012	Corn	GroupC-0171	3.27	0.00	2.66	1.26	46.09	2151	656	1495	SR
BS	2017	Corn	GroupC-0172	7.33	0.00	6.75	1.17	79.76	2050	757	1293	SR
BS	2019	Corn	GroupC-0173	3.01	0.09	2.66	1.18	31.57	2058	749	1309	SR
RD	2012	Corn	GroupC-0175	4.84	0.04	4.25	2.00	92.40	3779	1245	2534	SR
RD	2019	Corn	GroupC-0178	3.60	0.13	3.22	1.99	36.10	3767	1257	2510	SR

C.4 Group D

Table C.4: Machine learning results from the scenarios of group D.

Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
6	2013	Soybeans	GroupD-0001	0.16	0.91	0.12	6.88	4.20	18087	249	17838	RF
6	2014	Soybeans	GroupD-0002	0.26	0.89	0.20	5.50	5.89	17784	250	17534	RF
6	2015	Soybeans	GroupD-0003	0.22	0.89	0.17	4.85	8.36	18383	251	18132	RF
6	2016	Corn	GroupD-0004	0.41	0.95	0.29	9.04	4.60	33354	249	33105	RF
6	2017	Corn	GroupD-0005	0.81	0.95	0.63	11.13	6.69	41884	248	41636	RF
6	2018	Corn	GroupD-0006	0.76	0.96	0.58	9.66	9.69	39455	244	39211	RF
6	2019	Corn	GroupD-0007	0.43	0.92	0.30	5.32	6.47	17595	246	17349	RF
6	2020	Soybeans	GroupD-0008	0.17	0.95	0.12	3.39	4.58	11003	247	10756	RF
6	2021	Soybeans	GroupD-0009	0.26	0.97	0.19	3.12	6.81	19017	246	18771	RF
AM	2013	Soybeans	GroupD-0010	0.18	0.96	0.13	11.56	5.65	36940	1748	35192	RF
AM	2014	Soybeans	GroupD-0011	0.27	0.91	0.20	9.24	7.02	38187	1748	36439	RF
AM	2016	Corn	GroupD-0012	0.35	0.94	0.24	11.46	4.00	41656	1759	39897	RF
AM	2017	Corn	GroupD-0013	0.68	0.95	0.49	14.80	5.69	50935	1746	49189	RF
AM	2018	Corn	GroupD-0014	0.63	0.95	0.45	12.80	7.93	47757	1727	46030	RF
AM	2021	Soybeans	GroupD-0015	0.29	0.95	0.21	5.59	8.33	28058	1730	26328	RF
CF	2012	Soybeans	GroupD-0016	0.14	0.95	0.10	3.81	3.68	19645	1099	18546	RF
CF	2013	Corn	GroupD-0017	0.33	0.95	0.23	0.92	3.76	4429	1093	3336	RF
CF	2014	Corn	GroupD-0018	0.73	0.95	0.54	1.23	6.01	14163	1086	13077	RF
CF	2015	Soybeans	GroupD-0019	0.25	0.81	0.17	8.29	7.35	44896	1097	43799	RF
CF	2016	Soybeans	GroupD-0020	0.16	0.95	0.12	0.90	4.68	9011	1083	7928	RF
CF	2017	Corn	GroupD-0021	0.61	0.95	0.43	8.78	5.61	53767	1099	52668	RF
CF	2018	Corn	GroupD-0022	0.64	0.97	0.47	7.84	8.64	50542	1098	49444	RF
CF	2019	Soybeans	GroupD-0023	0.19	0.94	0.14	5.35	5.44	25254	1095	24159	RF
CF	2020	Corn	GroupD-0024	0.45	0.94	0.33	2.13	5.38	10296	1095	9201	RF
CF	2021	Soybeans	GroupD-0025	0.27	0.95	0.20	7.18	6.00	30634	1090	29544	RF
HB	2013	Soybeans	GroupD-0026	0.19	0.95	0.14	6.85	6.74	18087	558	17529	RF
HB	2014	Soybeans	GroupD-0027	0.34	0.95	0.25	5.51	11.02	17784	555	17229	RF
HB	2015	Soybeans	GroupD-0028	0.24	0.96	0.19	4.71	23.55	18383	549	17834	RF
HB	2017	Corn	GroupD-0029	0.93	0.96	0.69	18.83	9.84	81929	557	81372	RF
HB	2020	Soybeans	GroupD-0030	0.22	0.97	0.15	3.41	6.89	11003	555	10448	RF
HB	2021	Soybeans	GroupD-0031	0.21	0.95	0.15	3.35	5.76	19017	363	18654	RF
NH	2013	Soybeans	GroupD-0032	0.28	0.97	0.20	11.02	11.38	41491	173	41318	RF
NH	2014	Corn	GroupD-0033	0.34	0.93	0.22	0.25	3.29	3497	223	3274	RF
NH	2015	Corn	GroupD-0034	0.27	0.94	0.19	1.53	3.86	11165	221	10944	RF
NH	2016	Corn	GroupD-0035	0.25	0.94	0.19	4.84	3.24	28618	222	28396	RF
NH	2017	Corn	GroupD-0036	0.64	0.95	0.42	6.33	6.23	36062	226	35836	RF
NH	2018	Corn	GroupD-0037	0.72	0.95	0.52	5.61	11.45	33633	222	33411	RF
NH	2019	Corn	GroupD-0038	0.48	0.97	0.31	3.12	6.33	16875	215	16660	RF
NH	2020	Soybeans	GroupD-0039	0.28	0.97	0.17	6.86	8.58	32423	181	32242	RF
NH	2021	Soybeans	GroupD-0040	0.19	0.96	0.15	4.34	7.67	30390	51	30339	RF
PB	2012	Soybeans	GroupD-0041	0.26	0.96	0.17	2.38	8.25	15517	335	15182	RF
PB	2013	Corn	GroupD-0042	0.51	0.96	0.36	1.21	4.64	8093	327	7766	RF
PB	2014	Soybeans	GroupD-0043	0.32	0.96	0.23	6.82	9.04	35449	334	35115	RF
PB	2015	Soybeans	GroupD-0044	0.19	0.96	0.14	4.11	9.62	31513	327	31186	RF
PB	2016	Soybeans	GroupD-0045	0.24	0.96	0.18	0.60	9.34	5615	331	5284	RF
PB	2017	Corn	GroupD-0046	0.70	0.94	0.50	14.20	5.34	72432	338	72094	RF
PB	2018	Soybeans	GroupD-0047	0.28	0.96	0.21	0.44	9.81	5818	327	5491	RF
PB	2019	Soybeans	GroupD-0048	0.26	0.94	0.17	3.07	12.69	14878	278	14600	RF
PB	2020	Corn	GroupD-0049	0.62	0.96	0.46	3.33	5.67	16588	333	16255	RF
PB	2021	Soybeans	GroupD-0050	0.34	0.96	0.24	3.51	12.19	18600	246	18354	RF
PE	2018	Soybeans	GroupD-0051	0.19	0.94	0.14	0.25	4.01	4315	941	3374	RF
PE	2019	Soybeans	GroupD-0052	0.19	0.94	0.14	0.87	5.31	7929	942	6987	RF

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
PE	2020	Corn	GroupD-0053	0.49	0.92	0.35	1.72	4.22	11933	942	10991	RF
PE	2021	Soybeans	GroupD-0054	0.27	0.96	0.20	0.95	5.64	10583	938	9645	RF
PW	2018	Soybeans	GroupD-0055	0.18	0.95	0.13	0.25	4.01	4315	257	4058	RF
PW	2019	Soybeans	GroupD-0056	0.15	0.96	0.12	0.87	4.23	7929	259	7670	RF
PW	2020	Corn	GroupD-0057	0.52	0.95	0.39	2.11	5.01	11933	260	11673	RF
PW	2021	Soybeans	GroupD-0058	0.24	0.94	0.18	0.94	5.40	10583	246	10337	RF
PTB	2017	Corn	GroupD-0059	0.79	0.90	0.59	19.75	13.26	81929	296	81633	RF
PL	2012	Soybeans	GroupD-0060	0.18	0.96	0.13	3.88	4.93	22075	855	21220	RF
PL	2013	Corn	GroupD-0061	0.42	0.96	0.30	0.96	4.13	4036	972	3064	RF
PL	2014	Soybeans	GroupD-0062	0.28	0.91	0.22	12.21	7.01	49609	974	48635	RF
PL	2016	Corn	GroupD-0063	0.33	0.96	0.23	6.56	3.71	38265	978	37287	RF
PL	2017	Corn	GroupD-0064	0.63	0.96	0.46	8.72	6.02	44509	979	43530	RF
PL	2018	Corn	GroupD-0065	0.74	0.95	0.57	7.79	10.93	41284	974	40310	RF
PL	2019	Soybeans	GroupD-0066	0.17	0.95	0.12	6.61	5.16	23915	968	22947	RF
PL	2020	Corn	GroupD-0067	0.45	0.95	0.32	2.23	4.93	8144	976	7168	RF
PL	2021	Soybeans	GroupD-0068	0.29	0.93	0.22	7.40	6.38	29954	978	28976	RF
PLB	2012	Soybeans	GroupD-0069	0.15	0.95	0.11	3.10	4.11	17258	502	16756	RF
PLB	2013	Corn	GroupD-0070	0.44	0.96	0.31	0.91	4.43	4036	503	3533	RF
PLB	2014	Soybeans	GroupD-0071	0.30	0.92	0.23	10.01	7.81	38465	500	37965	RF
PLB	2015	Soybeans	GroupD-0072	0.19	0.94	0.14	7.51	8.48	35612	499	35113	RF
PLB	2016	Corn	GroupD-0073	0.31	0.95	0.21	6.50	3.73	38265	501	37764	RF
PLB	2017	Corn	GroupD-0074	0.70	0.95	0.50	8.70	7.26	44509	508	44001	RF
PLB	2018	Corn	GroupD-0075	0.78	0.96	0.59	8.70	13.87	41284	506	40778	RF
PLB	2019	Soybeans	GroupD-0076	0.24	0.96	0.16	5.61	8.50	18768	502	18266	RF
PLB	2020	Corn	GroupD-0077	0.47	0.96	0.34	2.14	5.09	8144	498	7646	RF
PLB	2021	Soybeans	GroupD-0078	0.36	0.96	0.24	6.43	8.78	23897	491	23406	RF
BG	2013	Soybeans	GroupD-0079	0.27	0.96	0.21	8.28	7.87	24779	1438	23341	RF
BG	2014	Soybeans	GroupD-0080	0.25	0.90	0.19	6.64	14.38	22174	1438	20736	RF
BG	2015	Soybeans	GroupD-0081	0.21	0.92	0.16	6.14	25.56	23863	1384	22479	RF
BG	2016	Corn	GroupD-0082	0.54	0.94	0.38	6.58	6.30	26917	1426	25491	RF
BG	2017	Corn	GroupD-0083	0.75	0.94	0.56	8.33	8.04	34802	1426	33376	RF
BG	2018	Corn	GroupD-0084	0.75	0.95	0.57	7.41	9.73	33018	1421	31597	RF
BG	2019	Corn	GroupD-0085	0.70	0.95	0.52	4.12	9.29	10513	1428	9085	RF
BG	2020	Soybeans	GroupD-0086	0.25	0.95	0.19	4.06	6.73	13729	1436	12293	RF
BG	2021	Corn	GroupD-0087	0.62	0.95	0.44	2.39	5.97	7082	1430	5652	RF
BBEA	2013	Soybeans	GroupD-0088	0.26	0.95	0.19	8.28	9.37	24779	3081	21698	RF
BBEA	2014	Soybeans	GroupD-0089	0.27	0.92	0.21	7.26	14.82	22174	3084	19090	RF
BBEA	2015	Soybeans	GroupD-0090	0.20	0.93	0.16	5.90	26.92	23863	2811	21052	RF
BBEA	2016	Corn	GroupD-0091	0.55	0.95	0.38	6.61	6.81	26917	3066	23851	RF
BBEA	2017	Corn	GroupD-0092	0.80	0.95	0.59	9.23	7.49	34802	2889	31913	RF
BBEA	2018	Corn	GroupD-0093	0.85	0.95	0.63	7.39	11.00	33018	3047	29971	RF
BBEA	2019	Corn	GroupD-0094	0.63	0.96	0.46	4.06	8.81	10513	3067	7446	RF
BBEA	2020	Soybeans	GroupD-0095	0.28	0.95	0.20	4.01	8.31	13729	3036	10693	RF
BBEA	2021	Corn	GroupD-0096	0.76	0.95	0.55	2.91	7.98	7082	3029	4053	RF
AA	2013	Soybeans	GroupD-0097	0.15	0.92	0.12	11.10	13.89	41669	378	41291	RF
AA	2014	Soybeans	GroupD-0098	0.31	0.95	0.22	3.92	7.83	14954	3968	10986	RF
AA	2015	Corn	GroupD-0099	0.48	0.95	0.34	4.04	4.05	19189	3961	15228	RF
AA	2016	Corn	GroupD-0100	0.50	0.96	0.35	8.36	5.10	40710	3973	36737	RF
AA	2017	Corn	GroupD-0101	0.83	0.95	0.61	11.07	6.71	49261	3860	45401	RF
AA	2018	Corn	GroupD-0102	0.87	0.95	0.65	10.91	7.80	46457	3975	42482	RF
AA	2019	Soybeans	GroupD-0103	0.19	0.95	0.14	1.13	5.07	6513	3976	2537	RF
AA	2020	Corn	GroupD-0104	0.56	0.95	0.42	3.25	4.44	14032	3962	10070	RF
AA	2021	Soybeans	GroupD-0105	0.22	0.95	0.15	2.82	4.67	11527	3966	7561	RF

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
CS	2012	Soybeans	GroupD-0106	0.28	0.95	0.21	3.83	7.74	18868	1942	16926	RF
CS	2013	Soybeans	GroupD-0107	0.24	0.95	0.18	6.82	9.70	26985	2440	24545	RF
CS	2014	Corn	GroupD-0108	8.31	0.00	8.04	0.15	71.26	0	2428	-2428	RF
CS	2015	Corn	GroupD-0109	0.51	0.96	0.37	2.06	5.78	14883	2451	12432	RF
CS	2016	Corn	GroupD-0110	0.53	0.97	0.35	2.38	5.88	15316	2440	12876	RF
CS	2017	Corn	GroupD-0111	0.64	0.94	0.47	3.70	5.29	24634	2373	22261	RF
CS	2018	Corn	GroupD-0112	0.81	0.95	0.62	2.84	7.04	22582	2437	20145	RF
CS	2019	Corn	GroupD-0113	0.73	0.95	0.56	1.43	6.72	8336	2440	5896	RF
CS	2020	Soybeans	GroupD-0114	0.21	0.94	0.15	4.16	4.37	15636	2437	13199	RF
CS	2021	Corn	GroupD-0115	0.53	0.95	0.39	0.92	3.73	6640	2437	4203	RF
JL	2017	Corn	GroupD-0116	0.66	0.96	0.48	3.77	5.19	24097	862	23235	RF
JL	2018	Corn	GroupD-0117	0.79	0.95	0.60	3.69	9.51	21275	901	20374	RF
JL	2019	Soybeans	GroupD-0118	0.15	0.95	0.11	2.52	6.85	9927	888	9039	RF
JL	2020	Corn	GroupD-0119	0.61	0.95	0.46	1.44	5.54	6727	889	5838	RF
JL	2021	Soybeans	GroupD-0120	0.22	0.94	0.16	2.57	4.77	13333	884	12449	RF
SP	2012	Soybeans	GroupD-0121	0.33	0.96	0.25	3.34	13.70	14051	1929	12122	RF
SP	2013	Soybeans	GroupD-0122	0.13	0.94	0.09	11.94	12.44	32241	1994	30247	RF
SP	2014	Soybeans	GroupD-0123	0.27	0.96	0.21	11.81	12.64	39109	1993	37116	RF
SP	2016	Corn	GroupD-0124	0.62	0.96	0.41	9.14	7.12	34236	1988	32248	RF
SP	2017	Corn	GroupD-0125	0.79	0.95	0.58	11.95	6.25	44726	1799	42927	RF
SP	2018	Corn	GroupD-0126	0.72	0.96	0.53	10.35	7.04	43617	1988	41629	RF
SP	2019	Corn	GroupD-0127	0.70	0.96	0.51	6.96	6.71	22251	1989	20262	RF
SP	2020	Soybeans	GroupD-0128	0.17	0.95	0.12	2.34	4.02	10395	1984	8411	RF
SP	2021	Corn	GroupD-0129	0.56	0.95	0.40	4.63	4.23	15978	1978	14000	RF
1P	2018	Corn	GroupD-0130	0.74	0.96	0.52	2.99	7.15	19778	770	19008	RF
1P	2019	Soybeans	GroupD-0131	0.21	0.96	0.15	1.21	6.15	6513	770	5743	RF
1P	2020	Corn	GroupD-0132	0.43	0.96	0.31	1.23	3.44	6501	770	5731	RF
1P	2021	Soybeans	GroupD-0133	0.20	0.95	0.15	1.76	4.21	10273	770	9503	RF
2PB	2018	Corn	GroupD-0134	0.75	0.95	0.53	2.37	7.05	19778	1764	18014	RF
2PB	2019	Soybeans	GroupD-0135	0.23	0.95	0.16	1.32	6.25	6513	1767	4746	RF
2PB	2020	Corn	GroupD-0136	0.61	0.94	0.43	1.11	5.06	6501	1769	4732	RF
2PB	2021	Soybeans	GroupD-0137	0.21	0.95	0.14	1.55	5.00	10273	1771	8502	RF
MP	2020	Soybeans	GroupD-0138	0.19	0.96	0.12	0.63	4.82	7888	954	6934	RF
BS	2013	Soybeans	GroupD-0139	0.25	0.96	0.18	6.52	7.78	28732	656	28076	RF
BS	2014	Soybeans	GroupD-0140	0.36	0.94	0.26	4.24	14.98	22779	656	22123	RF
BS	2015	Soybeans	GroupD-0141	0.21	0.95	0.17	4.84	15.00	26473	659	25814	RF
BS	2016	Soybeans	GroupD-0142	0.19	0.95	0.13	0.70	7.65	7833	655	7178	RF
BS	2017	Corn	GroupD-0143	0.88	0.95	0.65	16.41	9.53	72878	757	72121	RF
BS	2018	Soybeans	GroupD-0144	0.28	0.95	0.19	0.53	7.30	7137	752	6385	RF
BS	2019	Corn	GroupD-0145	0.78	0.95	0.61	7.92	8.19	35683	749	34934	RF
BS	2020	Soybeans	GroupD-0146	0.23	0.96	0.16	5.34	6.85	19663	748	18915	RF
RD	2013	Soybeans	GroupD-0147	0.25	0.95	0.17	2.58	6.93	12033	1256	10777	RF
RD	2014	Soybeans	GroupD-0148	0.25	0.96	0.17	2.21	5.59	13185	1259	11926	RF
RD	2015	Corn	GroupD-0149	0.39	0.96	0.27	4.06	4.42	29325	1261	28064	RF
RD	2017	Corn	GroupD-0150	0.61	0.95	0.41	5.71	5.05	36899	1261	35638	RF
RD	2019	Corn	GroupD-0151	0.59	0.96	0.42	2.95	5.89	21382	1257	20125	RF
RD	2020	Soybeans	GroupD-0152	0.24	0.95	0.17	1.28	6.53	7664	1254	6410	RF
RD	2021	Soybeans	GroupD-0153	0.31	0.96	0.22	1.71	8.02	14279	1259	13020	RF
6	2013	Soybeans	GroupD-0001	1.11	0.03	0.98	0.04	29.06	18087	249	17838	SVM
6	2014	Soybeans	GroupD-0002	1.59	0.01	1.47	0.04	36.43	17784	250	17534	SVM
6	2015	Soybeans	GroupD-0003	0.94	0.05	0.84	0.04	35.76	18383	251	18132	SVM
6	2016	Corn	GroupD-0004	1.18	0.01	0.96	0.06	13.07	33354	249	33105	SVM
6	2017	Corn	GroupD-0005	2.53	0.05	2.19	0.07	20.96	41884	248	41636	SVM

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
6	2018	Corn	GroupD-0006	2.38	0.00	1.95	0.06	30.23	39455	244	39211	SVM
6	2019	Corn	GroupD-0007	1.92	0.02	1.64	0.04	29.11	17595	246	17349	SVM
6	2020	Soybeans	GroupD-0008	0.66	0.00	0.51	0.03	17.91	11003	247	10756	SVM
6	2021	Soybeans	GroupD-0009	0.82	0.00	0.67	0.03	21.29	19017	246	18771	SVM
AM	2013	Soybeans	GroupD-0010	0.86	0.08	0.70	0.07	26.68	36940	1748	35192	SVM
AM	2014	Soybeans	GroupD-0011	1.14	0.13	1.01	0.05	29.10	38187	1748	36439	SVM
AM	2016	Corn	GroupD-0012	1.09	0.01	0.85	0.07	12.31	41656	1759	39897	SVM
AM	2017	Corn	GroupD-0013	2.43	0.03	2.07	0.08	20.16	50935	1746	49189	SVM
AM	2018	Corn	GroupD-0014	1.94	0.08	1.53	0.08	24.46	47757	1727	46030	SVM
AM	2021	Soybeans	GroupD-0015	0.97	0.12	0.71	0.04	27.35	28058	1730	26328	SVM
CF	2012	Soybeans	GroupD-0016	1.02	0.03	0.85	0.03	26.62	19645	1099	18546	SVM
CF	2013	Corn	GroupD-0017	1.42	0.02	1.09	0.01	15.92	4429	1093	3336	SVM
CF	2014	Corn	GroupD-0018	2.42	0.16	2.02	0.01	20.03	14163	1086	13077	SVM
CF	2015	Soybeans	GroupD-0019	1.69	0.10	1.62	0.05	50.56	44896	1097	43799	SVM
CF	2016	Soybeans	GroupD-0020	0.70	0.00	0.56	0.01	19.84	9011	1083	7928	SVM
CF	2017	Corn	GroupD-0021	1.80	0.02	1.41	0.06	16.43	53767	1099	52668	SVM
CF	2018	Corn	GroupD-0022	2.15	0.00	1.73	0.05	28.90	50542	1098	49444	SVM
CF	2019	Soybeans	GroupD-0023	1.19	0.04	1.05	0.04	34.23	25254	1095	24159	SVM
CF	2020	Corn	GroupD-0024	1.87	0.01	1.57	0.02	22.25	10296	1095	9201	SVM
CF	2021	Soybeans	GroupD-0025	1.10	0.02	0.89	0.05	24.76	30634	1090	29544	SVM
HB	2013	Soybeans	GroupD-0026	0.70	0.01	0.53	0.04	24.67	18087	558	17529	SVM
HB	2014	Soybeans	GroupD-0027	1.21	0.12	0.95	0.04	39.44	17784	555	17229	SVM
HB	2017	Corn	GroupD-0029	3.44	0.22	2.65	0.11	36.49	35746	557	35189	SVM
HB	2020	Soybeans	GroupD-0030	0.80	0.32	0.61	0.03	24.98	71420	555	70865	SVM
HB	2021	Soybeans	GroupD-0031	0.69	0.08	0.54	0.03	18.90	11003	363	10640	SVM
NH	2013	Soybeans	GroupD-0032	1.21	0.07	0.90	0.06	48.53	19017	173	18844	SVM
NH	2014	Corn	GroupD-0033	1.00	0.09	0.82	0.01	9.61	53572	223	53349	SVM
NH	2015	Corn	GroupD-0034	1.94	0.09	1.70	0.02	27.64	3497	221	3276	SVM
NH	2016	Corn	GroupD-0035	0.83	0.10	0.66	0.03	10.85	11165	222	10943	SVM
NH	2017	Corn	GroupD-0036	2.02	0.01	1.53	0.05	19.56	28618	226	28392	SVM
NH	2018	Corn	GroupD-0037	2.40	0.06	1.86	0.04	38.32	36062	222	35840	SVM
NH	2019	Corn	GroupD-0038	1.58	0.33	1.18	0.03	21.04	33633	215	33418	SVM
NH	2020	Soybeans	GroupD-0039	1.34	0.04	0.97	0.04	41.15	22469	181	22288	SVM
NH	2021	Soybeans	GroupD-0040	1.64	0.49	1.53	0.04	64.66	32423	51	32372	SVM
PB	2012	Soybeans	GroupD-0041	1.54	0.03	1.18	0.02	48.24	30390	335	30055	SVM
PB	2013	Corn	GroupD-0042	2.60	0.02	1.98	0.01	23.61	12893	327	12566	SVM
PB	2014	Soybeans	GroupD-0043	1.15	0.00	0.92	0.04	33.00	14816	334	14482	SVM
PB	2015	Soybeans	GroupD-0044	1.12	0.04	0.84	0.04	55.63	35449	327	35122	SVM
PB	2016	Soybeans	GroupD-0045	2.21	0.02	2.00	0.01	84.85	31513	331	31182	SVM
PB	2017	Corn	GroupD-0046	3.06	0.01	2.74	0.08	23.43	6261	338	5923	SVM
PB	2018	Soybeans	GroupD-0047	2.36	0.03	2.02	0.01	82.22	46168	327	45841	SVM
PB	2019	Soybeans	GroupD-0048	1.85	0.20	1.52	0.03	91.04	5818	278	5540	SVM
PB	2020	Corn	GroupD-0049	2.39	0.00	2.01	0.03	21.85	24194	333	23861	SVM
PB	2021	Soybeans	GroupD-0050	2.43	0.31	1.94	0.03	86.58	26852	246	26606	SVM
PE	2018	Soybeans	GroupD-0051	0.86	0.05	0.69	0.01	18.43	18600	941	17659	SVM
PE	2019	Soybeans	GroupD-0052	0.88	0.04	0.71	0.01	25.16	4315	942	3373	SVM
PE	2020	Corn	GroupD-0053	2.11	0.00	1.76	0.02	18.15	7092	942	6150	SVM
PE	2021	Soybeans	GroupD-0054	1.20	0.00	0.90	0.01	25.38	14796	938	13858	SVM
PW	2018	Soybeans	GroupD-0055	0.76	0.02	0.60	0.01	16.64	10583	257	10326	SVM
PW	2019	Soybeans	GroupD-0056	0.76	0.01	0.64	0.01	21.15	4315	259	4056	SVM
PW	2020	Corn	GroupD-0057	1.51	0.01	1.23	0.02	14.60	7092	260	6832	SVM
PW	2021	Soybeans	GroupD-0058	0.82	0.00	0.64	0.01	18.58	14796	246	14550	SVM
PTB	2017	Corn	GroupD-0059	4.93	0.03	4.40	0.11	82.80	6380	296	6084	SVM

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
PL	2012	Soybeans	GroupD-0060	0.74	0.00	0.58	0.03	20.66	71420	855	70565	SVM
PL	2013	Corn	GroupD-0061	1.33	0.02	1.07	0.01	13.14	28309	972	27337	SVM
PL	2014	Soybeans	GroupD-0062	1.56	0.04	1.43	0.08	39.35	13075	974	12101	SVM
PL	2016	Corn	GroupD-0063	1.00	0.00	0.77	0.05	11.37	56559	978	55581	SVM
PL	2017	Corn	GroupD-0064	1.92	0.01	1.50	0.06	18.43	38265	979	37286	SVM
PL	2018	Corn	GroupD-0065	2.47	0.02	1.97	0.05	36.33	44509	974	43535	SVM
PL	2019	Soybeans	GroupD-0066	1.41	0.24	1.32	0.04	43.91	38210	968	37242	SVM
PL	2020	Corn	GroupD-0067	1.44	0.24	1.14	0.02	15.72	45607	976	44631	SVM
PL	2021	Soybeans	GroupD-0068	1.59	0.06	1.45	0.05	34.57	23913	978	22935	SVM
PLB	2012	Soybeans	GroupD-0069	0.83	0.01	0.68	0.03	23.22	29954	502	29452	SVM
PLB	2013	Corn	GroupD-0070	1.24	0.03	0.95	0.01	12.59	25803	503	25300	SVM
PLB	2014	Soybeans	GroupD-0071	1.65	0.03	1.47	0.07	43.56	13075	500	12575	SVM
PLB	2015	Soybeans	GroupD-0072	1.12	0.11	0.96	0.05	49.08	38465	499	37966	SVM
PLB	2016	Corn	GroupD-0073	1.05	0.10	0.80	0.04	12.67	41213	501	40712	SVM
PLB	2017	Corn	GroupD-0074	2.42	0.00	1.99	0.06	25.32	38265	508	37757	SVM
PLB	2018	Corn	GroupD-0075	3.40	0.04	2.76	0.05	60.70	44509	506	44003	SVM
PLB	2019	Soybeans	GroupD-0076	1.03	0.21	0.87	0.04	36.72	38210	502	37708	SVM
PLB	2020	Corn	GroupD-0077	1.75	0.01	1.36	0.02	18.90	41315	498	40817	SVM
PLB	2021	Soybeans	GroupD-0078	1.45	0.01	1.26	0.04	35.05	23913	491	23422	SVM
BG	2013	Soybeans	GroupD-0079	1.57	0.13	1.32	0.06	44.96	23897	1438	22459	SVM
BG	2014	Soybeans	GroupD-0080	1.00	0.01	0.81	0.04	57.08	24779	1438	23341	SVM
BG	2016	Corn	GroupD-0082	1.64	0.08	1.33	0.05	19.05	48064	1426	46638	SVM
BG	2017	Corn	GroupD-0083	2.68	0.17	2.05	0.06	28.58	40850	1426	39424	SVM
BG	2018	Corn	GroupD-0084	2.53	0.20	1.93	0.05	32.72	26917	1421	25496	SVM
BG	2019	Corn	GroupD-0085	2.15	0.15	1.62	0.03	28.70	34802	1428	33374	SVM
BG	2020	Soybeans	GroupD-0086	1.11	0.01	0.89	0.03	29.57	43695	1436	42259	SVM
BG	2021	Corn	GroupD-0087	2.04	0.15	1.53	0.02	19.69	10513	1430	9083	SVM
BBEA	2013	Soybeans	GroupD-0088	1.05	0.04	0.83	0.05	37.92	13729	3081	10648	SVM
BBEA	2014	Soybeans	GroupD-0089	1.06	0.03	0.87	0.05	58.38	28472	3084	25388	SVM
BBEA	2016	Corn	GroupD-0091	1.80	0.04	1.35	0.05	22.31	55973	3066	52907	SVM
BBEA	2017	Corn	GroupD-0092	2.52	0.11	1.98	0.06	23.64	48064	2889	45175	SVM
BBEA	2018	Corn	GroupD-0093	2.64	0.13	2.06	0.05	34.04	40850	3047	37803	SVM
BBEA	2019	Corn	GroupD-0094	2.01	0.10	1.54	0.03	27.83	26917	3067	23850	SVM
BBEA	2020	Soybeans	GroupD-0095	1.02	0.06	0.80	0.03	30.36	48044	3036	45008	SVM
BBEA	2021	Corn	GroupD-0096	2.65	0.11	1.92	0.03	27.84	33018	3029	29989	SVM
AA	2014	Soybeans	GroupD-0098	1.15	0.16	0.90	0.03	29.28	38828	3968	34860	SVM
AA	2015	Corn	GroupD-0099	2.02	0.23	1.69	0.03	17.25	35165	3961	31204	SVM
AA	2016	Corn	GroupD-0100	1.94	0.28	1.55	0.06	19.84	7082	3973	3109	SVM
AA	2017	Corn	GroupD-0101	2.69	0.11	2.19	0.07	21.65	61225	3860	57365	SVM
AA	2018	Corn	GroupD-0102	3.05	0.20	2.61	0.07	27.20	28028	3975	24053	SVM
AA	2019	Soybeans	GroupD-0103	0.91	0.15	0.73	0.01	23.80	29989	3976	26013	SVM
AA	2020	Corn	GroupD-0104	2.01	0.13	1.70	0.03	15.92	40710	3962	36748	SVM
AA	2021	Soybeans	GroupD-0105	1.12	0.00	0.90	0.03	24.25	50082	3966	46116	SVM
CS	2012	Soybeans	GroupD-0106	1.39	0.07	1.12	0.03	38.13	48206	1942	46264	SVM
CS	2013	Soybeans	GroupD-0107	0.80	0.43	0.62	0.05	32.23	6513	2440	4073	SVM
CS	2014	Corn	GroupD-0108	8.27	0.13	7.99	0.01	70.95	14032	2428	11604	SVM
CS	2015	Corn	GroupD-0109	2.13	0.29	1.66	0.02	24.39	27326	2451	24875	SVM
CS	2016	Corn	GroupD-0110	1.93	0.60	1.53	0.02	21.45	31356	2440	28916	SVM
CS	2017	Corn	GroupD-0111	1.99	0.03	1.56	0.03	16.43	46296	2373	43923	SVM
CS	2018	Corn	GroupD-0112	2.90	0.18	2.46	0.02	25.27	0	2437	-2437	SVM
CS	2019	Corn	GroupD-0113	2.47	0.24	2.08	0.02	22.71	14883	2440	12443	SVM
CS	2020	Soybeans	GroupD-0114	1.04	0.11	0.79	0.03	21.59	9649	2437	7212	SVM
CS	2021	Corn	GroupD-0115	1.85	0.23	1.55	0.01	13.05	24634	2437	22197	SVM

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
JL	2017	Corn	GroupD-0116	2.71	0.20	2.35	0.02	21.34	22582	862	21720	SVM
JL	2018	Corn	GroupD-0117	2.86	0.16	2.41	0.02	34.18	8336	901	7435	SVM
JL	2019	Soybeans	GroupD-0118	1.78	0.07	1.61	0.02	81.81	15636	888	14748	SVM
JL	2020	Corn	GroupD-0119	2.27	0.11	1.96	0.01	20.71	6640	889	5751	SVM
JL	2021	Soybeans	GroupD-0120	1.18	0.01	0.96	0.02	25.89	11335	884	10451	SVM
SP	2012	Soybeans	GroupD-0121	1.53	0.03	1.28	0.03	63.45	10389	1929	8460	SVM
SP	2014	Soybeans	GroupD-0123	1.58	0.01	1.36	0.07	74.70	9927	1993	7934	SVM
SP	2016	Corn	GroupD-0124	2.24	0.49	1.82	0.06	25.66	6727	1988	4739	SVM
SP	2017	Corn	GroupD-0125	2.85	0.11	2.48	0.08	22.61	20031	1799	18232	SVM
SP	2018	Corn	GroupD-0126	2.79	0.19	2.27	0.07	27.13	28850	1988	26862	SVM
SP	2019	Corn	GroupD-0127	2.72	0.27	2.26	0.05	25.87	70618	1989	68629	SVM
SP	2020	Soybeans	GroupD-0128	1.07	0.08	0.86	0.02	24.62	39109	1984	37125	SVM
SP	2021	Corn	GroupD-0129	2.21	0.21	1.85	0.04	16.64	34236	1978	32258	SVM
1P	2018	Corn	GroupD-0130	2.40	0.14	1.84	0.02	23.20	44726	770	43956	SVM
1P	2019	Soybeans	GroupD-0131	0.81	0.31	0.62	0.01	23.31	54899	770	54129	SVM
1P	2020	Corn	GroupD-0132	1.36	0.25	1.06	0.01	10.75	22251	770	21481	SVM
1P	2021	Soybeans	GroupD-0133	0.85	0.11	0.68	0.02	17.73	10395	770	9625	SVM
2PB	2018	Corn	GroupD-0134	2.43	0.22	1.91	0.02	22.84	15978	1764	14214	SVM
2PB	2019	Soybeans	GroupD-0135	0.99	0.12	0.79	0.01	27.09	13020	1767	11253	SVM
2PB	2020	Corn	GroupD-0136	1.78	0.08	1.39	0.01	14.89	13010	1769	11241	SVM
2PB	2021	Soybeans	GroupD-0137	0.97	0.00	0.77	0.02	22.87	13020	1771	11249	SVM
MP	2020	Soybeans	GroupD-0138	1.32	0.02	1.13	0.01	34.36	10273	954	9319	SVM
BS	2013	Soybeans	GroupD-0139	1.68	0.02	1.51	0.04	52.83	13020	656	12364	SVM
BS	2014	Soybeans	GroupD-0140	1.06	0.03	0.85	0.03	44.11	6513	656	5857	SVM
BS	2015	Soybeans	GroupD-0141	0.90	0.01	0.66	0.04	65.41	13020	659	12361	SVM
BS	2016	Soybeans	GroupD-0142	0.83	0.07	0.65	0.01	32.73	10273	655	9618	SVM
BS	2017	Corn	GroupD-0143	2.95	0.00	2.23	0.09	32.08	5339	757	4582	SVM
BS	2018	Soybeans	GroupD-0144	0.88	0.15	0.66	0.01	23.18	28732	752	27980	SVM
BS	2019	Corn	GroupD-0145	2.89	0.09	2.57	0.05	30.29	28117	749	27368	SVM
BS	2020	Soybeans	GroupD-0146	1.10	0.12	0.93	0.04	32.20	26473	748	25725	SVM
RD	2013	Soybeans	GroupD-0147	1.59	0.32	1.44	0.02	44.07	7833	1256	6577	SVM
RD	2014	Soybeans	GroupD-0148	1.76	0.31	1.60	0.02	38.55	62524	1259	61265	SVM
RD	2015	Corn	GroupD-0149	2.13	0.11	1.71	0.04	24.42	4726	1261	3465	SVM
RD	2017	Corn	GroupD-0150	2.24	0.05	1.65	0.04	18.63	35683	1261	34422	SVM
RD	2019	Corn	GroupD-0151	2.09	0.13	1.56	0.02	20.91	34725	1257	33468	SVM
RD	2020	Soybeans	GroupD-0152	0.95	0.07	0.73	0.02	26.06	12033	1254	10779	SVM
RD	2021	Soybeans	GroupD-0153	1.07	0.32	0.91	0.02	27.95	13185	1259	11926	SVM
6	2013	Soybeans	GroupD-0001	1.11	0.03	0.98	0.04	29.06	18087	249	17838	ENR
6	2014	Soybeans	GroupD-0002	1.59	0.01	1.47	0.04	36.43	17784	250	17534	ENR
6	2015	Soybeans	GroupD-0003	0.94	0.05	0.84	0.04	35.76	18383	251	18132	ENR
6	2016	Corn	GroupD-0004	1.18	0.01	0.96	0.06	13.07	33354	249	33105	ENR
6	2017	Corn	GroupD-0005	2.53	0.05	2.19	0.07	20.96	41884	248	41636	ENR
6	2018	Corn	GroupD-0006	2.38	0.00	1.95	0.06	30.23	39455	244	39211	ENR
6	2019	Corn	GroupD-0007	1.92	0.02	1.64	0.04	29.11	17595	246	17349	ENR
6	2020	Soybeans	GroupD-0008	0.66	0.00	0.51	0.03	17.91	11003	247	10756	ENR
6	2021	Soybeans	GroupD-0009	0.82	0.00	0.67	0.03	21.29	19017	246	18771	ENR
AM	2013	Soybeans	GroupD-0010	0.86	0.08	0.70	0.07	26.68	36940	1748	35192	ENR
AM	2014	Soybeans	GroupD-0011	1.14	0.13	1.01	0.05	29.10	38187	1748	36439	ENR
AM	2016	Corn	GroupD-0012	1.09	0.01	0.85	0.07	12.31	41656	1759	39897	ENR
AM	2017	Corn	GroupD-0013	2.43	0.03	2.07	0.08	20.16	50935	1746	49189	ENR
AM	2018	Corn	GroupD-0014	1.94	0.08	1.53	0.08	24.46	47757	1727	46030	ENR
AM	2021	Soybeans	GroupD-0015	0.97	0.12	0.71	0.04	27.35	28058	1730	26328	ENR
CF	2012	Soybeans	GroupD-0016	1.02	0.03	0.85	0.03	26.62	19645	1099	18546	ENR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
CF	2013	Corn	GroupD-0017	1.42	0.02	1.09	0.01	15.92	4429	1093	3336	ENR
CF	2014	Corn	GroupD-0018	2.42	0.16	2.02	0.01	20.03	14163	1086	13077	ENR
CF	2015	Soybeans	GroupD-0019	1.69	0.10	1.62	0.05	50.56	44896	1097	43799	ENR
CF	2016	Soybeans	GroupD-0020	0.70	0.00	0.56	0.01	19.84	9011	1083	7928	ENR
CF	2017	Corn	GroupD-0021	1.80	0.02	1.41	0.06	16.43	53767	1099	52668	ENR
CF	2018	Corn	GroupD-0022	2.15	0.00	1.73	0.05	28.90	50542	1098	49444	ENR
CF	2019	Soybeans	GroupD-0023	1.19	0.04	1.05	0.04	34.23	25254	1095	24159	ENR
CF	2020	Corn	GroupD-0024	1.87	0.01	1.57	0.02	22.25	10296	1095	9201	ENR
CF	2021	Soybeans	GroupD-0025	1.10	0.02	0.89	0.05	24.76	30634	1090	29544	ENR
HB	2013	Soybeans	GroupD-0026	0.70	0.01	0.53	0.04	24.67	18087	558	17529	ENR
HB	2014	Soybeans	GroupD-0027	1.21	0.12	0.95	0.04	39.44	17784	555	17229	ENR
HB	2017	Corn	GroupD-0029	3.44	0.22	2.65	0.11	36.49	35746	557	35189	ENR
HB	2020	Soybeans	GroupD-0030	0.80	0.32	0.61	0.03	24.98	71420	555	70865	ENR
HB	2021	Soybeans	GroupD-0031	0.69	0.08	0.54	0.03	18.90	11003	363	10640	ENR
NH	2013	Soybeans	GroupD-0032	1.21	0.07	0.90	0.06	48.53	19017	173	18844	ENR
NH	2014	Corn	GroupD-0033	1.00	0.09	0.82	0.01	9.61	53572	223	53349	ENR
NH	2015	Corn	GroupD-0034	1.94	0.09	1.70	0.02	27.64	3497	221	3276	ENR
NH	2016	Corn	GroupD-0035	0.83	0.10	0.66	0.03	10.85	11165	222	10943	ENR
NH	2017	Corn	GroupD-0036	2.02	0.01	1.53	0.05	19.56	28618	226	28392	ENR
NH	2018	Corn	GroupD-0037	2.40	0.06	1.86	0.04	38.32	36062	222	35840	ENR
NH	2019	Corn	GroupD-0038	1.58	0.33	1.18	0.03	21.04	33633	215	33418	ENR
NH	2020	Soybeans	GroupD-0039	1.34	0.04	0.97	0.04	41.15	22469	181	22288	ENR
NH	2021	Soybeans	GroupD-0040	1.64	0.49	1.53	0.04	64.66	32423	51	32372	ENR
PB	2012	Soybeans	GroupD-0041	1.54	0.03	1.18	0.02	48.24	30390	335	30055	ENR
PB	2013	Corn	GroupD-0042	2.60	0.02	1.98	0.01	23.61	12893	327	12566	ENR
PB	2014	Soybeans	GroupD-0043	1.15	0.00	0.92	0.04	33.00	14816	334	14482	ENR
PB	2015	Soybeans	GroupD-0044	1.12	0.04	0.84	0.04	55.63	35449	327	35122	ENR
PB	2016	Soybeans	GroupD-0045	2.21	0.02	2.00	0.01	84.85	31513	331	31182	ENR
PB	2017	Corn	GroupD-0046	3.06	0.01	2.74	0.08	23.43	6261	338	5923	ENR
PB	2018	Soybeans	GroupD-0047	2.36	0.03	2.02	0.01	82.22	46168	327	45841	ENR
PB	2019	Soybeans	GroupD-0048	1.85	0.20	1.52	0.03	91.04	5818	278	5540	ENR
PB	2020	Corn	GroupD-0049	2.39	0.00	2.01	0.03	21.85	24194	333	23861	ENR
PB	2021	Soybeans	GroupD-0050	2.43	0.31	1.94	0.03	86.58	26852	246	26606	ENR
PE	2018	Soybeans	GroupD-0051	0.86	0.05	0.69	0.01	18.43	18600	941	17659	ENR
PE	2019	Soybeans	GroupD-0052	0.88	0.04	0.71	0.01	25.16	4315	942	3373	ENR
PE	2020	Corn	GroupD-0053	2.11	0.00	1.76	0.02	18.15	7092	942	6150	ENR
PE	2021	Soybeans	GroupD-0054	1.20	0.00	0.90	0.01	25.38	14796	938	13858	ENR
PW	2018	Soybeans	GroupD-0055	0.76	0.02	0.60	0.01	16.64	10583	257	10326	ENR
PW	2019	Soybeans	GroupD-0056	0.76	0.01	0.64	0.01	21.15	4315	259	4056	ENR
PW	2020	Corn	GroupD-0057	1.51	0.01	1.23	0.02	14.60	7092	260	6832	ENR
PW	2021	Soybeans	GroupD-0058	0.82	0.00	0.64	0.01	18.58	14796	246	14550	ENR
PTB	2017	Corn	GroupD-0059	4.93	0.03	4.40	0.11	82.80	6380	296	6084	ENR
PL	2012	Soybeans	GroupD-0060	0.74	0.00	0.58	0.03	20.66	71420	855	70565	ENR
PL	2013	Corn	GroupD-0061	1.33	0.02	1.07	0.01	13.14	28309	972	27337	ENR
PL	2014	Soybeans	GroupD-0062	1.56	0.04	1.43	0.08	39.35	13075	974	12101	ENR
PL	2016	Corn	GroupD-0063	1.00	0.00	0.77	0.05	11.37	56559	978	55581	ENR
PL	2017	Corn	GroupD-0064	1.92	0.01	1.50	0.06	18.43	38265	979	37286	ENR
PL	2018	Corn	GroupD-0065	2.47	0.02	1.97	0.05	36.33	44509	974	43535	ENR
PL	2019	Soybeans	GroupD-0066	1.41	0.24	1.32	0.04	43.91	38210	968	37242	ENR
PL	2020	Corn	GroupD-0067	1.44	0.24	1.14	0.02	15.72	45607	976	44631	ENR
PL	2021	Soybeans	GroupD-0068	1.59	0.06	1.45	0.05	34.57	23913	978	22935	ENR
PLB	2012	Soybeans	GroupD-0069	0.83	0.01	0.68	0.03	23.22	29954	502	29452	ENR
PLB	2013	Corn	GroupD-0070	1.24	0.03	0.95	0.01	12.59	25803	503	25300	ENR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
PLB	2014	Soybeans	GroupD-0071	1.65	0.03	1.47	0.07	43.56	13075	500	12575	ENR
PLB	2015	Soybeans	GroupD-0072	1.12	0.11	0.96	0.05	49.08	38465	499	37966	ENR
PLB	2016	Corn	GroupD-0073	1.05	0.10	0.80	0.04	12.67	41213	501	40712	ENR
PLB	2017	Corn	GroupD-0074	2.42	0.00	1.99	0.06	25.32	38265	508	37757	ENR
PLB	2018	Corn	GroupD-0075	3.40	0.04	2.76	0.05	60.70	44509	506	44003	ENR
PLB	2019	Soybeans	GroupD-0076	1.03	0.21	0.87	0.04	36.72	38210	502	37708	ENR
PLB	2020	Corn	GroupD-0077	1.75	0.01	1.36	0.02	18.90	41315	498	40817	ENR
PLB	2021	Soybeans	GroupD-0078	1.45	0.01	1.26	0.04	35.05	23913	491	23422	ENR
BG	2013	Soybeans	GroupD-0079	1.57	0.13	1.32	0.06	44.96	23897	1438	22459	ENR
BG	2014	Soybeans	GroupD-0080	1.00	0.01	0.81	0.04	57.08	24779	1438	23341	ENR
BG	2016	Corn	GroupD-0082	1.64	0.08	1.33	0.05	19.05	48064	1426	46638	ENR
BG	2017	Corn	GroupD-0083	2.68	0.17	2.05	0.06	28.58	40850	1426	39424	ENR
BG	2018	Corn	GroupD-0084	2.53	0.20	1.93	0.05	32.72	26917	1421	25496	ENR
BG	2019	Corn	GroupD-0085	2.15	0.15	1.62	0.03	28.70	34802	1428	33374	ENR
BG	2020	Soybeans	GroupD-0086	1.11	0.01	0.89	0.03	29.57	43695	1436	42259	ENR
BG	2021	Corn	GroupD-0087	2.04	0.15	1.53	0.02	19.69	10513	1430	9083	ENR
BBEA	2013	Soybeans	GroupD-0088	1.05	0.04	0.83	0.05	37.92	13729	3081	10648	ENR
BBEA	2014	Soybeans	GroupD-0089	1.06	0.03	0.87	0.05	58.38	28472	3084	25388	ENR
BBEA	2016	Corn	GroupD-0091	1.80	0.04	1.35	0.05	22.31	55973	3066	52907	ENR
BBEA	2017	Corn	GroupD-0092	2.52	0.11	1.98	0.06	23.64	48064	2889	45175	ENR
BBEA	2018	Corn	GroupD-0093	2.64	0.13	2.06	0.05	34.04	40850	3047	37803	ENR
BBEA	2019	Corn	GroupD-0094	2.01	0.10	1.54	0.03	27.83	26917	3067	23850	ENR
BBEA	2020	Soybeans	GroupD-0095	1.02	0.06	0.80	0.03	30.36	48044	3036	45008	ENR
BBEA	2021	Corn	GroupD-0096	2.65	0.11	1.92	0.03	27.84	33018	3029	29989	ENR
AA	2014	Soybeans	GroupD-0098	1.15	0.16	0.90	0.03	29.28	38828	3968	34860	ENR
AA	2015	Corn	GroupD-0099	2.02	0.23	1.69	0.03	17.25	35165	3961	31204	ENR
AA	2016	Corn	GroupD-0100	1.94	0.28	1.55	0.06	19.84	7082	3973	3109	ENR
AA	2017	Corn	GroupD-0101	2.69	0.11	2.19	0.07	21.65	61225	3860	57365	ENR
AA	2018	Corn	GroupD-0102	3.05	0.20	2.61	0.07	27.20	28028	3975	24053	ENR
AA	2019	Soybeans	GroupD-0103	0.91	0.15	0.73	0.01	23.80	29989	3976	26013	ENR
AA	2020	Corn	GroupD-0104	2.01	0.13	1.70	0.03	15.92	40710	3962	36748	ENR
AA	2021	Soybeans	GroupD-0105	1.12	0.00	0.90	0.03	24.25	50082	3966	46116	ENR
CS	2012	Soybeans	GroupD-0106	1.39	0.07	1.12	0.03	38.13	48206	1942	46264	ENR
CS	2013	Soybeans	GroupD-0107	0.80	0.43	0.62	0.05	32.23	6513	2440	4073	ENR
CS	2014	Corn	GroupD-0108	8.27	0.13	7.99	0.01	70.95	14032	2428	11604	ENR
CS	2015	Corn	GroupD-0109	2.13	0.29	1.66	0.02	24.39	27326	2451	24875	ENR
CS	2016	Corn	GroupD-0110	1.93	0.60	1.53	0.02	21.45	31356	2440	28916	ENR
CS	2017	Corn	GroupD-0111	1.99	0.03	1.56	0.03	16.43	46296	2373	43923	ENR
CS	2018	Corn	GroupD-0112	2.90	0.18	2.46	0.02	25.27	0	2437	-2437	ENR
CS	2019	Corn	GroupD-0113	2.47	0.24	2.08	0.02	22.71	14883	2440	12443	ENR
CS	2020	Soybeans	GroupD-0114	1.04	0.11	0.79	0.03	21.59	9649	2437	7212	ENR
CS	2021	Corn	GroupD-0115	1.85	0.23	1.55	0.01	13.05	24634	2437	22197	ENR
JL	2017	Corn	GroupD-0116	2.71	0.20	2.35	0.02	21.34	22582	862	21720	ENR
JL	2018	Corn	GroupD-0117	2.86	0.16	2.41	0.02	34.18	8336	901	7435	ENR
JL	2019	Soybeans	GroupD-0118	1.78	0.07	1.61	0.02	81.81	15636	888	14748	ENR
JL	2020	Corn	GroupD-0119	2.27	0.11	1.96	0.01	20.71	6640	889	5751	ENR
JL	2021	Soybeans	GroupD-0120	1.18	0.01	0.96	0.02	25.89	11335	884	10451	ENR
SP	2012	Soybeans	GroupD-0121	1.53	0.03	1.28	0.03	63.45	10389	1929	8460	ENR
SP	2014	Soybeans	GroupD-0123	1.58	0.01	1.36	0.07	74.70	9927	1993	7934	ENR
SP	2016	Corn	GroupD-0124	2.24	0.49	1.82	0.06	25.66	6727	1988	4739	ENR
SP	2017	Corn	GroupD-0125	2.85	0.11	2.48	0.08	22.61	20031	1799	18232	ENR
SP	2018	Corn	GroupD-0126	2.79	0.19	2.27	0.07	27.13	28850	1988	26862	ENR
SP	2019	Corn	GroupD-0127	2.72	0.27	2.26	0.05	25.87	70618	1989	68629	ENR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
SP	2020	Soybeans	GroupD-0128	1.07	0.08	0.86	0.02	24.62	39109	1984	37125	ENR
SP	2021	Corn	GroupD-0129	2.21	0.21	1.85	0.04	16.64	34236	1978	32258	ENR
1P	2018	Corn	GroupD-0130	2.40	0.14	1.84	0.02	23.20	44726	770	43956	ENR
1P	2019	Soybeans	GroupD-0131	0.81	0.31	0.62	0.01	23.31	54899	770	54129	ENR
1P	2020	Corn	GroupD-0132	1.36	0.25	1.06	0.01	10.75	22251	770	21481	ENR
1P	2021	Soybeans	GroupD-0133	0.85	0.11	0.68	0.02	17.73	10395	770	9625	ENR
2PB	2018	Corn	GroupD-0134	2.43	0.22	1.91	0.02	22.84	15978	1764	14214	ENR
2PB	2019	Soybeans	GroupD-0135	0.99	0.12	0.79	0.01	27.09	13020	1767	11253	ENR
2PB	2020	Corn	GroupD-0136	1.78	0.08	1.39	0.01	14.89	13010	1769	11241	ENR
2PB	2021	Soybeans	GroupD-0137	0.97	0.00	0.77	0.02	22.87	13020	1771	11249	ENR
MP	2020	Soybeans	GroupD-0138	1.32	0.02	1.13	0.01	34.36	10273	954	9319	ENR
BS	2013	Soybeans	GroupD-0139	1.68	0.02	1.51	0.04	52.83	13020	656	12364	ENR
BS	2014	Soybeans	GroupD-0140	1.06	0.03	0.85	0.03	44.11	6513	656	5857	ENR
BS	2015	Soybeans	GroupD-0141	0.90	0.01	0.66	0.04	65.41	13020	659	12361	ENR
BS	2016	Soybeans	GroupD-0142	0.83	0.07	0.65	0.01	32.73	10273	655	9618	ENR
BS	2017	Corn	GroupD-0143	2.95	0.00	2.23	0.09	32.08	5339	757	4582	ENR
BS	2018	Soybeans	GroupD-0144	0.88	0.15	0.66	0.01	23.18	28732	752	27980	ENR
BS	2019	Corn	GroupD-0145	2.89	0.09	2.57	0.05	30.29	28117	749	27368	ENR
BS	2020	Soybeans	GroupD-0146	1.10	0.12	0.93	0.04	32.20	26473	748	25725	ENR
RD	2013	Soybeans	GroupD-0147	1.59	0.32	1.44	0.02	44.07	7833	1256	6577	ENR
RD	2014	Soybeans	GroupD-0148	1.76	0.31	1.60	0.02	38.55	62524	1259	61265	ENR
RD	2015	Corn	GroupD-0149	2.13	0.11	1.71	0.04	24.42	4726	1261	3465	ENR
RD	2017	Corn	GroupD-0150	2.24	0.05	1.65	0.04	18.63	35683	1261	34422	ENR
RD	2019	Corn	GroupD-0151	2.09	0.13	1.56	0.02	20.91	34725	1257	33468	ENR
RD	2020	Soybeans	GroupD-0152	0.95	0.07	0.73	0.02	26.06	12033	1254	10779	ENR
RD	2021	Soybeans	GroupD-0153	1.07	0.32	0.91	0.02	27.95	13185	1259	11926	ENR
6	2013	Soybeans	GroupD-0001	0.77	0.01	0.66	5.89	20.12	18087	249	17838	SR
6	2014	Soybeans	GroupD-0002	1.15	0.01	1.03	6.41	26.41	17784	250	17534	SR
6	2015	Soybeans	GroupD-0003	0.85	0.01	0.74	11.56	32.19	18383	251	18132	SR
6	2016	Corn	GroupD-0004	1.09	0.08	0.83	9.80	12.06	33354	249	33105	SR
6	2017	Corn	GroupD-0005	2.88	0.08	2.48	9.97	23.86	41884	248	41636	SR
6	2018	Corn	GroupD-0006	2.42	0.00	2.07	9.02	30.67	39455	244	39211	SR
6	2019	Corn	GroupD-0007	1.48	0.13	1.20	4.92	22.42	17595	246	17349	SR
6	2020	Soybeans	GroupD-0008	0.65	0.00	0.50	4.11	17.44	11003	247	10756	SR
6	2021	Soybeans	GroupD-0009	0.83	0.00	0.65	4.16	21.58	19017	246	18771	SR
AM	2013	Soybeans	GroupD-0010	0.65	0.34	0.51	5.82	20.21	36940	1748	35192	SR
AM	2014	Soybeans	GroupD-0011	0.86	0.25	0.73	6.64	22.07	38187	1748	36439	SR
AM	2017	Corn	GroupD-0013	2.16	0.08	1.75	10.04	17.97	50935	1746	49189	SR
AM	2018	Corn	GroupD-0014	1.95	0.06	1.56	9.14	24.59	47757	1727	46030	SR
AM	2021	Soybeans	GroupD-0015	0.92	0.17	0.70	4.19	26.19	28058	1730	26328	SR
CF	2012	Soybeans	GroupD-0016	0.48	0.14	0.37	3.65	12.43	19645	1099	18546	SR
CF	2013	Corn	GroupD-0017	1.10	0.07	0.85	1.55	12.32	4429	1093	3336	SR
CF	2014	Corn	GroupD-0018	2.06	0.34	1.61	1.96	17.08	14163	1086	13077	SR
CF	2015	Soybeans	GroupD-0019	1.30	0.03	1.16	6.96	38.77	44896	1097	43799	SR
CF	2016	Soybeans	GroupD-0020	0.56	0.13	0.43	1.41	16.00	9011	1083	7928	SR
CF	2017	Corn	GroupD-0021	1.88	0.00	1.45	10.00	17.16	53767	1099	52668	SR
CF	2018	Corn	GroupD-0022	2.09	0.02	1.64	8.29	28.10	50542	1098	49444	SR
CF	2019	Soybeans	GroupD-0023	0.69	0.06	0.55	5.47	19.94	25254	1095	24159	SR
CF	2020	Corn	GroupD-0024	1.50	0.02	1.22	3.17	17.84	10296	1095	9201	SR
CF	2021	Soybeans	GroupD-0025	0.90	0.01	0.70	6.46	20.21	30634	1090	29544	SR
HB	2013	Soybeans	GroupD-0026	0.66	0.01	0.53	6.02	23.23	18087	558	17529	SR
HB	2014	Soybeans	GroupD-0027	1.13	0.01	0.91	6.37	36.83	17784	555	17229	SR
HB	2020	Soybeans	GroupD-0030	0.86	0.26	0.64	3.98	26.72	11003	555	10448	SR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
HB	2021	Soybeans	GroupD-0031	0.70	0.01	0.53	4.18	19.38	19017	363	18654	SR
NH	2013	Soybeans	GroupD-0032	1.09	0.19	0.84	5.87	43.56	41491	173	41318	SR
NH	2014	Corn	GroupD-0033	0.98	0.15	0.77	0.67	9.47	3497	223	3274	SR
NH	2015	Corn	GroupD-0034	1.01	0.01	0.79	2.47	14.48	11165	221	10944	SR
NH	2016	Corn	GroupD-0035	1.10	0.01	0.89	9.83	14.30	28618	222	28396	SR
NH	2017	Corn	GroupD-0036	2.43	0.04	1.86	10.04	23.48	36062	226	35836	SR
NH	2019	Corn	GroupD-0038	1.58	0.22	1.12	4.92	21.03	16875	215	16660	SR
NH	2020	Soybeans	GroupD-0039	1.09	0.35	0.77	5.02	33.64	32423	181	32242	SR
NH	2021	Soybeans	GroupD-0040	0.89	0.45	0.75	4.21	35.10	30390	51	30339	SR
PB	2012	Soybeans	GroupD-0041	1.03	0.10	0.83	3.62	32.22	15517	335	15182	SR
PB	2013	Corn	GroupD-0042	1.75	0.42	1.42	1.52	15.92	8093	327	7766	SR
PB	2014	Soybeans	GroupD-0043	1.01	0.06	0.79	8.60	28.97	35449	334	35115	SR
PB	2016	Soybeans	GroupD-0045	0.76	0.10	0.61	1.36	29.30	5615	331	5284	SR
PB	2018	Soybeans	GroupD-0047	1.13	0.22	0.95	1.48	39.25	5818	327	5491	SR
PB	2019	Soybeans	GroupD-0048	0.94	0.40	0.70	5.47	46.52	14878	278	14600	SR
PB	2020	Corn	GroupD-0049	1.85	0.02	1.50	3.20	16.88	16588	333	16255	SR
PE	2018	Soybeans	GroupD-0051	0.58	0.12	0.46	1.46	12.51	4315	941	3374	SR
PE	2019	Soybeans	GroupD-0052	0.61	0.22	0.49	3.38	17.29	7929	942	6987	SR
PE	2020	Corn	GroupD-0053	1.64	0.09	1.29	3.20	14.09	11933	942	10991	SR
PE	2021	Soybeans	GroupD-0054	0.91	0.43	0.75	4.20	19.29	10583	938	9645	SR
PW	2018	Soybeans	GroupD-0055	0.54	0.21	0.40	1.46	11.84	4315	257	4058	SR
PW	2019	Soybeans	GroupD-0056	0.54	0.01	0.43	3.44	14.86	7929	259	7670	SR
PW	2020	Corn	GroupD-0057	1.58	0.00	1.31	3.19	15.27	11933	260	11673	SR
PW	2021	Soybeans	GroupD-0058	0.77	0.00	0.62	4.19	17.47	10583	246	10337	SR
PL	2012	Soybeans	GroupD-0060	0.63	0.03	0.46	3.63	17.40	22075	855	21220	SR
PL	2013	Corn	GroupD-0061	1.22	0.14	0.93	1.52	11.98	4036	972	3064	SR
PL	2014	Soybeans	GroupD-0062	0.94	0.04	0.80	8.57	23.85	49609	974	48635	SR
PL	2016	Corn	GroupD-0063	1.03	0.00	0.80	6.93	11.71	38265	978	37287	SR
PL	2017	Corn	GroupD-0064	1.94	0.01	1.52	10.03	18.65	44509	979	43530	SR
PL	2018	Corn	GroupD-0065	2.20	0.02	1.84	8.16	32.27	41284	974	40310	SR
PL	2019	Soybeans	GroupD-0066	0.64	0.08	0.51	5.44	19.76	23915	968	22947	SR
PL	2020	Corn	GroupD-0067	1.38	0.23	1.04	3.19	14.99	8144	976	7168	SR
PL	2021	Soybeans	GroupD-0068	1.02	0.00	0.83	6.48	22.20	29954	978	28976	SR
PLB	2012	Soybeans	GroupD-0069	0.54	0.05	0.42	3.64	15.07	17258	502	16756	SR
PLB	2013	Corn	GroupD-0070	1.22	0.04	0.88	1.51	12.44	4036	503	3533	SR
PLB	2014	Soybeans	GroupD-0071	1.05	0.15	0.89	8.59	27.75	38465	500	37965	SR
PLB	2015	Soybeans	GroupD-0072	0.72	0.13	0.62	6.88	31.49	35612	499	35113	SR
PLB	2016	Corn	GroupD-0073	1.16	0.02	0.92	6.93	13.91	38265	501	37764	SR
PLB	2017	Corn	GroupD-0074	2.10	0.01	1.68	10.00	21.90	44509	508	44001	SR
PLB	2018	Corn	GroupD-0075	2.54	0.03	2.11	8.24	45.31	41284	506	40778	SR
PLB	2019	Soybeans	GroupD-0076	0.85	0.26	0.67	5.46	30.39	18768	502	18266	SR
PLB	2020	Corn	GroupD-0077	1.75	0.03	1.37	3.22	18.91	8144	498	7646	SR
PLB	2021	Soybeans	GroupD-0078	1.27	0.02	0.89	6.47	30.74	23897	491	23406	SR
BG	2013	Soybeans	GroupD-0079	0.94	0.35	0.76	5.83	26.88	24779	1438	23341	SR
BG	2014	Soybeans	GroupD-0080	0.85	0.06	0.69	6.34	48.78	22174	1438	20736	SR
BG	2015	Soybeans	GroupD-0081	0.80	0.05	0.66	11.66	98.79	23863	1384	22479	SR
BG	2017	Corn	GroupD-0083	2.24	0.27	1.74	10.03	23.93	34802	1426	33376	SR
BG	2018	Corn	GroupD-0084	2.25	0.33	1.79	9.00	29.15	33018	1421	31597	SR
BG	2019	Corn	GroupD-0085	2.07	0.15	1.64	4.90	27.70	10513	1428	9085	SR
BG	2020	Soybeans	GroupD-0086	0.82	0.05	0.66	3.98	21.87	13729	1436	12293	SR
BG	2021	Corn	GroupD-0087	1.99	0.23	1.55	3.74	19.18	7082	1430	5652	SR
BBEA	2013	Soybeans	GroupD-0088	0.86	0.21	0.66	5.78	31.27	24779	3081	21698	SR
BBEA	2014	Soybeans	GroupD-0089	0.92	0.04	0.72	6.34	50.83	22174	3084	19090	SR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
BBEA	2016	Corn	GroupD-0091	1.62	0.24	1.21	10.04	20.10	26917	3066	23851	SR
BBEA	2017	Corn	GroupD-0092	2.34	0.22	1.83	10.19	21.93	34802	2889	31913	SR
BBEA	2018	Corn	GroupD-0093	2.38	0.26	1.85	9.04	30.60	33018	3047	29971	SR
BBEA	2019	Corn	GroupD-0094	1.87	0.16	1.45	4.96	25.96	10513	3067	7446	SR
BBEA	2020	Soybeans	GroupD-0095	0.83	0.23	0.62	3.99	24.62	13729	3036	10693	SR
BBEA	2021	Corn	GroupD-0096	2.34	0.21	1.74	3.77	24.54	7082	3029	4053	SR
AA	2013	Soybeans	GroupD-0097	0.56	0.01	0.44	7.50	50.59	41669	378	41291	SR
AA	2014	Soybeans	GroupD-0098	0.92	0.26	0.71	3.83	23.53	14954	3968	10986	SR
AA	2015	Corn	GroupD-0099	1.53	0.32	1.16	4.35	13.06	19189	3961	15228	SR
AA	2016	Corn	GroupD-0100	1.64	0.47	1.26	9.80	16.79	40710	3973	36737	SR
AA	2017	Corn	GroupD-0101	2.48	0.23	1.94	12.36	19.95	49261	3860	45401	SR
AA	2018	Corn	GroupD-0102	2.62	0.31	2.05	11.99	23.37	46457	3975	42482	SR
AA	2019	Soybeans	GroupD-0103	0.61	0.24	0.48	3.52	15.96	6513	3976	2537	SR
AA	2020	Corn	GroupD-0104	1.69	0.21	1.32	5.58	13.43	14032	3962	10070	SR
AA	2021	Soybeans	GroupD-0105	0.63	0.14	0.48	4.15	13.58	11527	3966	7561	SR
CS	2012	Soybeans	GroupD-0106	1.00	0.03	0.81	3.68	27.44	18868	1942	16926	SR
CS	2013	Soybeans	GroupD-0107	0.71	0.49	0.57	3.32	28.96	26985	2440	24545	SR
CS	2015	Corn	GroupD-0109	1.78	0.41	1.40	4.10	20.30	14883	2451	12432	SR
CS	2016	Corn	GroupD-0110	1.66	0.60	1.25	5.31	18.40	15316	2440	12876	SR
CS	2017	Corn	GroupD-0111	1.84	0.18	1.41	6.96	15.16	24634	2373	22261	SR
CS	2018	Corn	GroupD-0112	2.56	0.28	2.09	8.25	22.31	22582	2437	20145	SR
CS	2019	Corn	GroupD-0113	2.21	0.35	1.78	3.55	20.30	8336	2440	5896	SR
CS	2020	Soybeans	GroupD-0114	0.63	0.19	0.49	3.53	13.03	15636	2437	13199	SR
CS	2021	Corn	GroupD-0115	1.56	0.35	1.23	3.18	11.00	6640	2437	4203	SR
JL	2017	Corn	GroupD-0116	2.27	0.23	1.79	6.52	17.87	24097	862	23235	SR
JL	2018	Corn	GroupD-0117	2.63	0.21	2.12	5.74	31.41	21275	901	20374	SR
JL	2019	Soybeans	GroupD-0118	0.53	0.04	0.42	3.53	24.36	9927	888	9039	SR
JL	2020	Corn	GroupD-0119	1.88	0.18	1.50	3.26	17.18	6727	889	5838	SR
JL	2021	Soybeans	GroupD-0120	0.70	0.03	0.53	4.34	15.37	13333	884	12449	SR
SP	2012	Soybeans	GroupD-0121	1.04	0.02	0.82	3.65	43.22	14051	1929	12122	SR
SP	2013	Soybeans	GroupD-0122	0.50	0.18	0.41	7.43	48.75	32241	1994	30247	SR
SP	2014	Soybeans	GroupD-0123	0.84	0.03	0.67	9.46	39.43	39109	1993	37116	SR
SP	2016	Corn	GroupD-0124	2.00	0.50	1.44	9.76	22.89	34236	1988	32248	SR
SP	2017	Corn	GroupD-0125	2.53	0.18	2.10	12.46	20.12	44726	1799	42927	SR
SP	2018	Corn	GroupD-0126	2.46	0.28	1.94	12.05	24.00	43617	1988	41629	SR
SP	2019	Corn	GroupD-0127	2.27	0.33	1.78	6.74	21.62	22251	1989	20262	SR
SP	2020	Soybeans	GroupD-0128	0.55	0.19	0.42	3.66	12.69	10395	1984	8411	SR
SP	2021	Corn	GroupD-0129	1.78	0.26	1.34	5.84	13.39	15978	1978	14000	SR
1P	2018	Corn	GroupD-0130	2.31	0.21	1.73	5.89	22.41	19778	770	19008	SR
1P	2019	Soybeans	GroupD-0131	0.66	0.50	0.49	3.48	18.97	6513	770	5743	SR
1P	2020	Corn	GroupD-0132	1.27	0.29	0.98	3.44	10.05	6501	770	5731	SR
1P	2021	Soybeans	GroupD-0133	0.67	0.11	0.54	4.15	14.03	10273	770	9503	SR
2PB	2018	Corn	GroupD-0134	2.37	0.24	1.82	5.85	22.25	19778	1764	18014	SR
2PB	2019	Soybeans	GroupD-0135	0.72	0.38	0.56	3.45	19.92	6513	1767	4746	SR
2PB	2020	Corn	GroupD-0136	1.76	0.10	1.35	3.41	14.67	6501	1769	4732	SR
2PB	2021	Soybeans	GroupD-0137	0.70	0.14	0.53	4.13	16.48	10273	1771	8502	SR
MP	2020	Soybeans	GroupD-0138	0.63	0.47	0.47	3.53	16.35	7888	954	6934	SR
BS	2013	Soybeans	GroupD-0139	0.84	0.00	0.63	7.35	26.36	28732	656	28076	SR
BS	2014	Soybeans	GroupD-0140	1.12	0.11	0.86	6.31	46.49	22779	656	22123	SR
BS	2015	Soybeans	GroupD-0141	0.83	0.02	0.67	6.90	60.48	26473	659	25814	SR
BS	2016	Soybeans	GroupD-0142	0.56	0.16	0.45	1.34	22.33	7833	655	7178	SR
BS	2017	Corn	GroupD-0143	2.71	0.00	2.10	10.00	29.52	72878	757	72121	SR
BS	2018	Soybeans	GroupD-0144	0.81	0.17	0.61	1.46	21.49	7137	752	6385	SR

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Val	Year	Crop	Scenario	RMSE	R2	MAE	Time [h]	Error [%]	Obs [Train]	Obs [Val]	Dif. Obs.	Model
BS	2019	Corn	GroupD-0145	2.71	0.08	2.36	4.90	28.35	35683	749	34934	SR
BS	2020	Soybeans	GroupD-0146	0.79	0.16	0.58	6.35	23.15	19663	748	18915	SR
RD	2013	Soybeans	GroupD-0147	0.76	0.47	0.54	3.30	21.10	12033	1256	10777	SR
RD	2014	Soybeans	GroupD-0148	0.78	0.46	0.56	3.81	17.21	13185	1259	11926	SR
RD	2015	Corn	GroupD-0149	1.52	0.06	1.17	4.07	17.44	29325	1261	28064	SR
RD	2017	Corn	GroupD-0150	1.87	0.26	1.40	4.97	15.55	36899	1261	35638	SR
RD	2019	Corn	GroupD-0151	1.93	0.17	1.49	2.99	19.31	21382	1257	20125	SR
RD	2020	Soybeans	GroupD-0152	0.76	0.18	0.59	3.02	20.75	7664	1254	6410	SR
RD	2021	Soybeans	GroupD-0153	1.04	0.23	0.82	4.15	27.30	14279	1259	13020	SR

Appendix D

Economic Analysis

Table D.1: Net income per year using the three cases of pivot irrigation from the Alabama Cooperative Extension System.

Year	**Crop**	**Mean income [$/ha]**	**Fields**	**Case 1 [$/ha]**	**Case 2 [$/ha]**	**Case 3 [$/ha]**
2012	Corn	-76.50	1	-587.47	-420.47	-499.17
2013	Soybeans	120.10	2	-390.87	-223.87	-302.57
2014	Corn	134.40	1	-376.57	-209.57	-288.27
2014	Soybeans	510.30	1	-0.67	166.33	87.63
2015	Corn	267.00	3	-243.97	-76.97	-155.67
2015	Soybeans	2.30	1	-508.67	-341.67	-420.37
2016	Corn	879.40	3	368.43	535.43	456.73
2016	Soybeans	75.80	1	-435.17	-268.17	-346.87
2017	Corn	-87.60	4	-598.57	-431.57	-510.27
2018	Corn	251.30	5	-259.67	-92.67	-171.37
2018	Soybeans	115.50	1	-395.47	-228.47	-307.17
2019	Corn	522.50	3	11.53	178.53	99.83
2019	Soybeans	197.60	3	-313.37	-146.37	-225.07
2020	Corn	120.40	2	-390.57	-223.57	-302.27

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Year	Crop	Mean income [$/ha]	Fields	Case 1 [$/ha]	Case 2 [$/ha]	Case 3 [$/ha]
2020	Soybeans	110.20	3	-400.77	-233.77	-312.47
2021	Corn	45.90	3	-465.07	-298.07	-376.77
2021	Soybeans	-22.90	4	-533.87	-366.87	-445.57

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