Eating the Landscape You Live In:
How Can Contemporary Communities be incorporated into the Agricultural Landscape?

JULIE MICHAEL
COLLEGE OF ARCHITECTURE, DESIGN, AND CONSTRUCTION
SCHOOL OF ARCHITECTURE
MASTER OF LANDSCAPE ARCHITECTURE
MASTER OF COMMUNITY PLANNING
MAY 2010

For my Mother and In Loving Memory of my Father.

Acknowledgements

I am very grateful to the many people who supported this project the whole way through. I would especially like to thank Rod Barnett, Charlene LeBleu, Cheryl Morgan, Karen Rogers, and Professor John Pittari for all their academic support and guidance throughout this endeavor and throughout my career at Auburn University. Also, I would like to extend my gratitude to the entire CADC staff including the IT staff for their tireless efforts helping in all our technology woes.

I would also like to thank my family and friends for putting up with the roller coaster ride that is 'thesis'. Without their love and devotion throughout the process, I would never have pushed through. A special thanks to my husband Scott who has supported me the whole way through, and put up with long hours of me working at Dudley to get it done.

Finally, I would like to extend a very special thanks to my Mother whos own strength has been inspirational and carried me through this project. Thank you for always advising me to take steps in the right direction; without your support I would never have accomplished this Masters. I am forever grateful for everything you have taught me.

List of Illustrations

Abstract

This thesis explores the idea of creating settlements that function aesthetically, as well as economically, by designing and incorporating human living conditions into productive agrarian landscapes. The project designs a village based on the practices associated with sustainable food production at the local community scale. Production practices are examined first and priority placed on these techniques over the typical human settlement pattern. The project examines exactly how humans will be able to occupy the spaces within agricultural production. Human needs are also considered and adaptations made, which can provide an improved way of living by promoting biodiversity through the production that exists in the landscape.

Long before any type of urban developments, transportation routes, and mass production existed; people had to survive on natural resources that grew and lived in their regions. Every small town or village should take advantage of the potential for designing with edible green space in mind because they may not always enjoy the luxury of having produce shipped from afar to their local groceries. For landscape architecture in general, this should be a topic that more people incorporate, even in little increments, to designed spaces. If we are going to replace the natural environment with the built environment, it is only fair to augment parts of that built environment with landscape which provides direct benefits for human and other ecosystems.

This topic is important because landscapes can be designed in ways which incorporate the edible plant repertoire of regions, while following seasonal changes in the plants as well. By creating space within a settlement for sustainable agriculture, we are allowing organisms to thrive and continue the cycles of nutrient replenishment in the soil. The project investigates the possibility of deriving settlement design from production plant operations.

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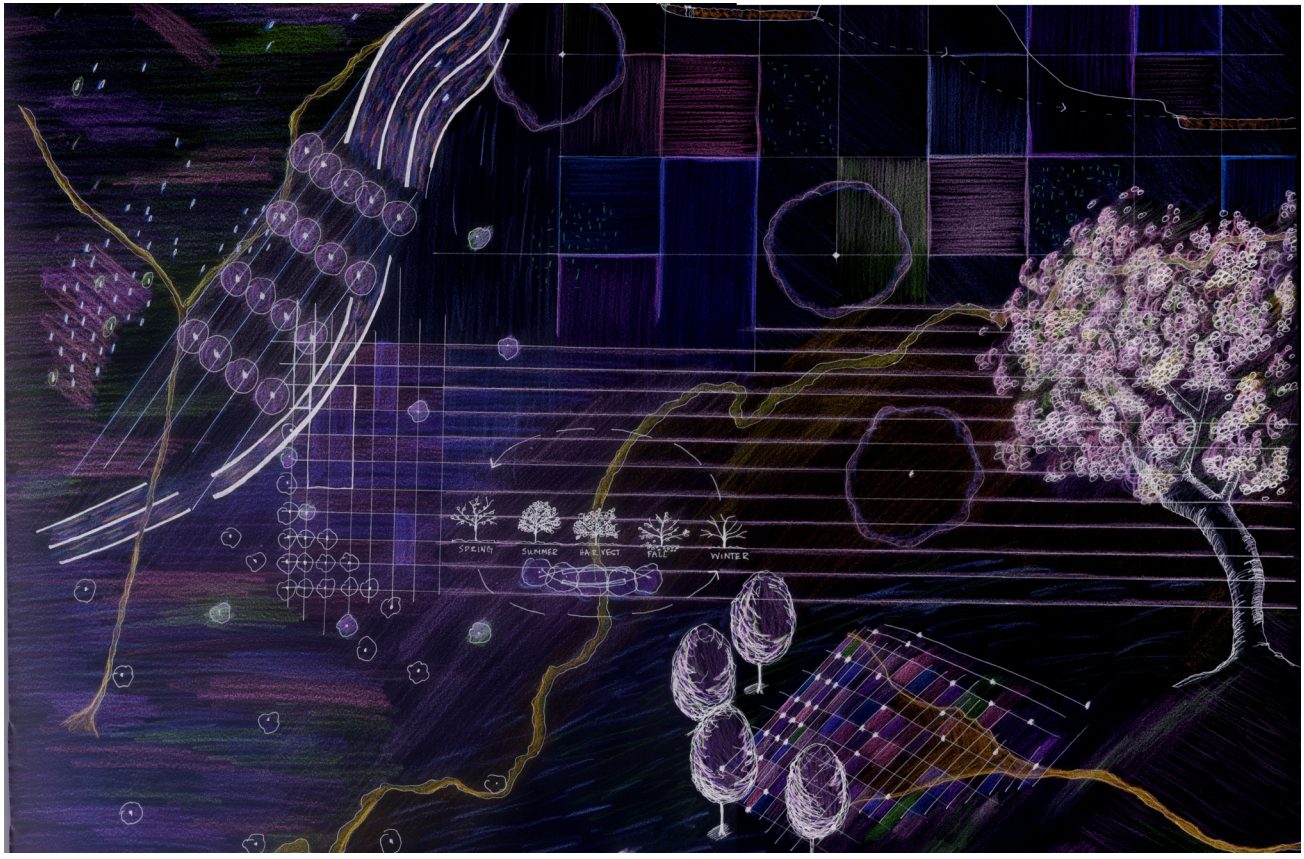


Figure 1

Graphic exploration demonstrates the spatial potential of 21st century communities when production patterns and settlement patterns combine.
Medium: colored pencil on vellum, re-rendered in photoshop

“We have less than half the number of farmers in the United States that we had in 1977. Our farm communities are far worse off now then they were then. Our soil erosion rates continue to be unsustainably high. We continue to pollute our soils and streams with agricultural poisons. We continue to lose farmland to urban development of the most wasteful sort. The large agribusiness corporations that were mainly national in 1977 are now global, replacing the world’s agricultural diversity, which was useful primarily to farmers and local consumers, with bioengineered and patented mono cultures that are merely profitable to corporations.”

Wendell Berry, 2004

Introduction

As modern technology has become more advanced, human beings have put all their dependence on the products of these technologies. Humans have controlled plant life in an effort to provide for their own lives (Pollan 2001). This control has gone from hands-on participation to a mechanization of the work needed to cultivate life. Mass production has become the way of the world now (Berry 1996), and it is hard to imagine that anything said or done will have much of an impact in changing that fact. Globalization has combined with mass production, and now anyone in most any part of the world can have vegetables or fruits at their fingertips with no concern for growing seasons. This is a lifestyle choice that is made fairly simple for most people because all one has to do to enjoy the benefits of mass production is make a trip to the local grocery store and be overwhelmed by the amount of fresh fruits and vegetables available in the middle of winter. A detachment has occurred between humans and food production (Berry 1996), which is why there is a need to make people more aware of the work that actually goes into the food they are consuming.

It is hard for modern families to adjust their eating habits because the choices they are given and the convenience of the grocery store or local food chain often makes them follow the simplest route to obtain their daily meals (Pollan 2008). I am not proposing that these luxuries be taken away from people, but development analysis shows that some changes need to occur within the development process that can start to accommodate daily necessities and reduce

our dependence on imported foods.

Human settlements have been taking over ecosystems throughout history. At times, this has meant cultivating certain crops in what previously were woodland habitats (Sereni 1997). Although these methods may not have been sustainable in preserving the quality of the soil, they did allow the settlers to sustain life and begin growing towns. Somewhere along the way people removed themselves from the production of food, or the production of food was removed from the areas where people lived. This created and continues to create a detachment and de-sensitivity to the actual amount of energy it takes to grow and harvest edible necessities.

If new settlements and communities are going to continue to be necessary due to demanding population changes, then these new settlements must be created in a way that preserves the agricultural qualities of the peri-urban fringe which they continue to engulf. This design project explores how settlement can occur while still allowing production to occur as well. Development and human settlement are not given priority in the project, but rather the needs of the agricultural species being produced form the groundwork for site-specific settlement design.

During a review of recent literature and case studies dealing with the issue of urban agriculture and food production in the landscape, a discovery was made that the issue of food production is often examined ultimately after everything else has been developed. Most of the time community gardens are tucked away out of immediate sight within a community. The project suggests that this design method of developing the dwelling units of a place first can be reversed to allow the area layout of food production to be analyzed and planned at the beginning of the development process, not after all the building structures have been put into place and ideal soil layers already disturbed. Initial investigation and interest into the

production of food came about after reading two books by Michael Pollan, The Omnivore's Dilemma and In Defense of Food. The entire first section of The Omnivore's Dilemma describes how industrial corn has taken over the grocery store shelves. Items that would never have been thought to have corn in them now contain corn products in one way or another. Pollan discusses how he tried to figure out where most of our food comes from by looking into the industrial food chain. He examines and follows the chain until it finally leads him to the beginning:

> I invariably found myself in almost exactly the same place: a farm field in the American Corn Belt. The great edifice of variety and choice that is an American supermarket turns out to rest on a remarkably narrow biological foundation comprised of a tiny group of plants that is dominated by a single species: Zea mays, the giant tropical grass most Americans know as corn. …. Corn is what feeds the steer that becomes the steak. Corn feeds the chicken and the pig, the turkey and the lamb, the catfish and the tilapia and, increasingly, even the salmon, a carnivore by nature that the fish farmers are re-engineering to tolerate corn. The eggs are made of corn. The milk and cheese and yogurt, which once came from dairy cows that grazed on grass, now typically come from Holsteins that spend their lives indoors tethered to machines, eating corn ((Pollan 2006, 17-18).

Not only is corn found in the vast majority of items, the government subsidies for industrial corn and soy farmers are also huge and continue to contribute to the destruction of small-scale farms throughout the nation (Pollan 2006). This is a problem that has been brewing since the 1970's and was written about by Wendell Berry, with a prediction of exactly what has happened today with the irreversible effects of industrial farming. The film Food, Inc. describes our current food production industry as never having food companies this big and powerful in the history of the United States (Kenner 2008). People seem no longer to have many choices in the way they eat without making a very stringent effort to choose quality over value. One step that has evolved in helping to combat the industrialization of food is to shop locally and not support the buffet of selection at the grocery stores (Pollan 2008).

The detachment of food production from people's everyday lives is a problem that has now created

concern about human health and food safety issues, along with environmental issues (Pollan 2008). By bringing production back into the human realm, some of the adverse effects that are already being seen from industrialization may begin to reverse themselves. If small changes occur at the village or neighborhood scale, then eventually a larger change will begin to emerge at the national level.

Population increase and a larger amount of product consumption by the average person contribute to many of the food production problems being faced currently. Historically, as populations increased, city dwellers began to move outwards toward the open space surrounding the urban centers. (Hall 2002). These areas became known as the suburbs, and they continue to engulf productive land with no regard for any form of ecological life besides humans. The term known as 'suburban sprawl' is explained briefly: "Unlike the traditional neighborhood model, which evolved organically as a response to human needs, suburban sprawl is an idealized artificial system" (Duany 2000, 4). Duany goes on to discuss how quickly sprawl consumes the land, and the fact that now a "new suburban edge" seems to be emerging as the population growth continues (Duany 2000, 5).

As suburban sprawl advances, the pattern for settlement often does not take into consideration the agricultural farmland on which the design is placed. This is something that must be considered and proper planning should be done to make sure that new development occurs only after the prime production lands have been located. If human development is going to continue to spread and encroach on viable lands, then at least it should be done in a way that attempts to unite with the land and allow for a more localized development pattern from the start. As I will describe towards the end of this text, the process used in this design takes into consideration a number of ecological elements
before the parcel layout is ever considered.

Figure 2

Photograph from the book *Over* by Alex MacLean. The image shows "Tract housing borders agricultural fields as development expands outward. The fields, zoned for residential use, will soon be filled in with similar housing" (MacLean, 2008, 306).
Although this is an example of residential development in Arizona, it is happening in various parts of the United States and is a clear picture of where the future of development is heading.

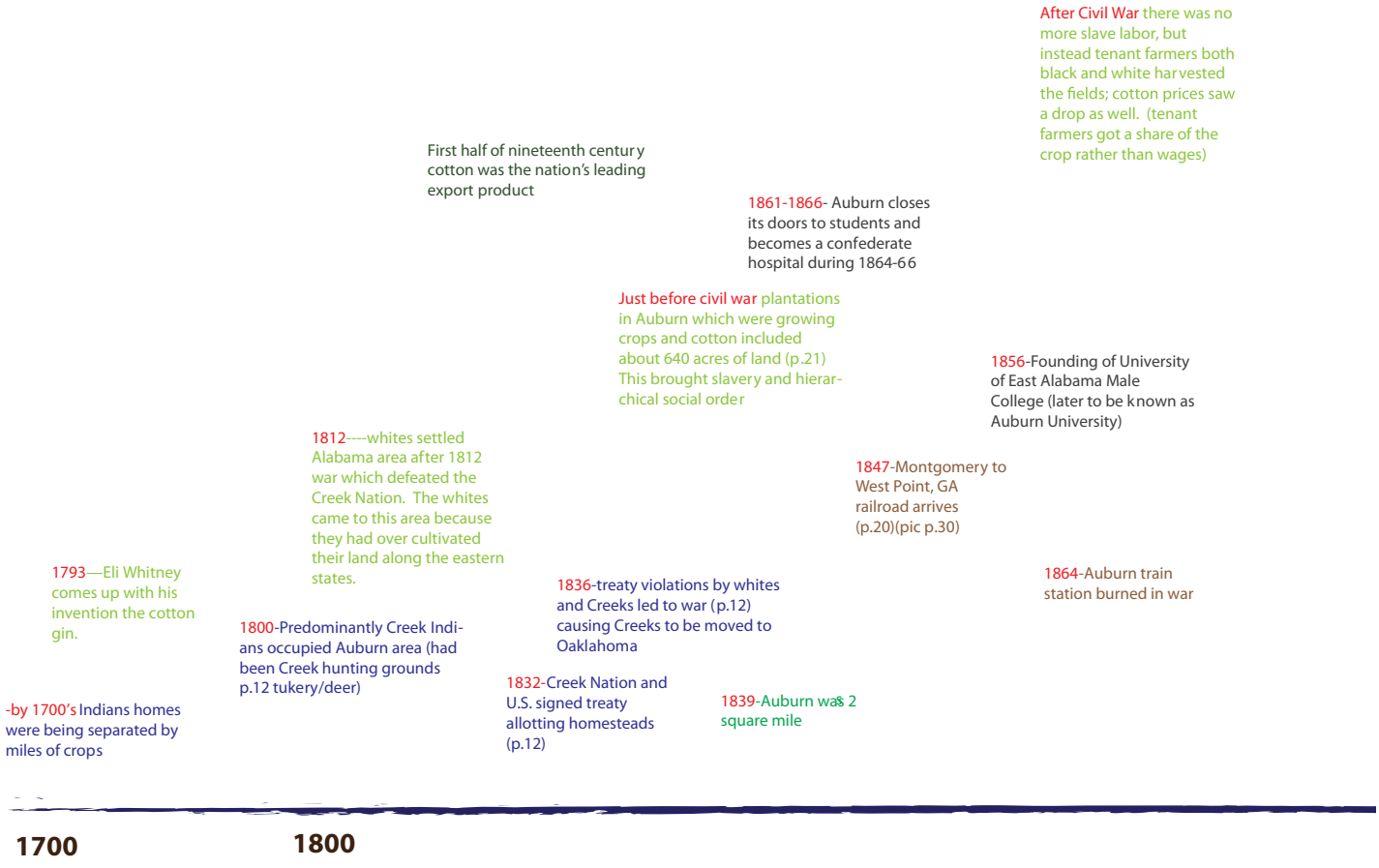

After Civil War there was no more slave labor, but instead tenant farmers both black and white harvested the fields; cotton prices saw a drop as well. (tenant farmers got a share of the crop rather than wages)
First half of nineteenth century cotton was the nation's leading export product
1861-1866- Auburn closes its doors to students and becomes a confederate hospital during 1864-66
Just before civil war plantations in Auburn which were growing crops and cotton included about 640 acres of land (p.21) This brought slavery and hierarchical social order
1856-Founding of University of East Alabama Male College (later to be known as Auburn University)
1812----whites settled Alabama area after 1812 war which defeated the Creek Nation. The whites came to this area because they had over cultivated their land along the eastern states.
1847-Montgomery to West Point, GA railroad arrives (p.20)(pic p.30)
1793—Eli Whitney comes up with his invention the cotton gin.
1836-treaty violations by whites and Creeks led to war (p.12) causing Creeks to be moved to Oaklahoma
1864-Auburn train station burned in war
1800-Predominantly Creek Indians occupied Auburn area (had been Creek hunting grounds p.12 tukery/deer)
1832-Creek Nation and U.S. signed treaty allotting homesteads (p.12)
1839-Auburn was 2 square mile
-by 1700's Indians homes were being separated by miles of crops
1700
1800

Figure 3

1890—Farmer's Alliance was active in nationalizing railroads and federal involvement in commodity market

Early twentieth century government combined themselves with business interests in controlling the agricultural policy and this was retained through the end of World War II

1929--- stock market crash and The New Deal. Farmer's got support from The New Deal, that allowed landowners to have federal support in order to lessen their commodities. This caused farmers to mechanize their cultivation, and fertilize; all while producing more on less land.

1950- Desegregation issues arrise at Auburn

1909—Boll weevil insect enters Alabama from Mississippi

1920—American Farm Bureau Federation opens a branch in the state of Alabama

1960- Name changes from Alabama Polytechnic Institute to Auburn University

1931- Financial issues at Auburn University begin

1896-Old Rotation started and is still the "oldest, continous cotton experiment in the United States." (rotate cotton plot with corn, winter/summer legurmes, fertilizer nitrogen)

1914- A network of farm agents through out the nations land-grant colleges were placed because of the Smith-Lever Act

1925-1945—Alabama encountered more changes during this time then it had in the past 100 years

1872- Bill passed which made Auburn the Agricultural and Mechanical college of Alabama, a land-grant college (p.34)

WWII---caused for increased demand of farm products and encouraged use of capitol for mechanization of fields

Early twentieth century- diversification of crops in Alabama became important; especially because of the boll weevil insect problem which cotton production faced.

KEY
- AGRICULTURAL HISTORY
- CREEK HISTORY
- AUBURN AGRICULTURE
- AUBURN HISTORY
- TRANSPORTATION

1900 **2000**

source: Logue, M. and Simms, J. (1996)
Cox, D. (1995)

“Self-sufficiency may be the rage right now, but it’s not a new concept. After all, pioneers had to be independent to survive in a new, often hostile, environment. A move away from the land began when farming became mechanized after WWII. Soon, suburbia replaced fields, and gardens gave way to landscaping.”

Waller 2010

Chapter Two: History and Context

History of Auburn, Alabama

The small college town of Auburn, Alabama continues to grow and expand its reach across the landscape. What started as a small village with about 1,018 occupants in 1870 has now become a large land-grant university campus that comprises the heart of the town (Logue 1996). Current population numbers in Auburn are estimated at 56,000 (U.S. Census Bureau 2010). Occupation of the Auburn area spanned even further back than 1870, when the Creek Indians used areas in and around Auburn as their hunting grounds for turkey and deer (Logue 1996). This is a tradition that would continue long after the Creeks were forced off their land. As shown in the history time line in figure 3, the town of Auburn faced many changes before becoming the successful place it is today. The location of Auburn has always been very suitable for farming operations. Even before the civil war, "plantations in Auburn which were growing crops and cotton included about 640 acres of land" (Logue 1996, 21). During the University's early beginnings as an all-male college, the main focus was on agriculture and engineering, and in 1872 a Bill was passed which made Auburn "the Agricultural and Mechanical college of Alabama, a land-grant college" (Logue 1996, 34). Home to one of the oldest continuous experiments in the United States, Auburn's Old Rotation was started in 1896 rotating cotton plots with other annual crops to help with soil preservation (Logue 1996). Today, the University is still well known for its engineering and agriculture schools and continues to move forward with new experiments and ideas.

The agricultural history of Auburn has gone through several changes from its start. From cotton fields and the hierarchical order associated with this type of production, to the boll weevil infestation and the need for a variety of crops,

the state of Alabama has come a long way with its agriculture (Cox 1995). As the mechanization of production began to take over fields in Auburn and all over the state, the need for this mechanization seemed inevitable (Cox 1995). After WWI, people began to see a change in agriculture prices and the amount of land under cultivation. Farmers were able to employ fewer tenant workers and receive funding from the federal government to "mechanize, fertilize, and produce more on fewer acres" (Cox 1995). This trend continued through WWII, as more people moved away from the farmland and into the urban areas in pursuit of better jobs (Cox 1995). Now there is such a disconnect between people and farmland that not many realize how their food is actually being produced, harvested, and distributed; even those that do understand often find it hard (or expensive) to consider the alternative of trying to buy local. Because of current mass production techniques, food does not seem to have the same nutritional values it once did. Michael Pollan (2009) states in the film Fresh that analysis of the fresh produce from the 1950's compared with today shows a reduction in the amount of key nutrients, minerals, and vitamins by 40%. The fertilizer being pumped into the food does not replace the essential nutrients that are obtained from healthy soils (Joanes 2009). In terms of sustainability and productivity, the medium sized organic farm is much more productive than any sized industrial farm operation; all the inputs associated with industrial agriculture are what make it so unsustainable (Joanes 2009). This pattern of industrialization, which seems to be having an increasing stronghold on the way Americans eat, was long in the making and predicted by Wendell Berry (1974) to do exactly what it has done today. He discusses the idea of "food-as-weapon" which was being used by the Department of Agriculture to promote the need for industrial scale farming (Berry 1996, 10). This is what he predicts will happen when corporations are running American agriculture:

> The cost of this corporate totalitarianism in energy, land, and social disruption will be enormous. It will lead to the exhaustion of farmland and farm culture. Husbandry will

> become an extractive industry; because maintenance will entirely give way to production, the fertility of the soil will become a limited, unrenewable resource like coal or oil. …… This may not happen. It need not happen. But it is necessary to recognize that it can happen…. If it does happen we are familiar enough with the nature of American salesmanship to know that it will be done in the name of the starving millions, in the name of liberty, justice, democracy, and brotherhood, and to free the world from communism (Berry 1996, 10).

Berry's text, which was originally written in 1974, is an eerie realization of what has been happening and continues to happen with food production in the United States since it was written. Choices must be made nationwide to go local, eat within the food-shed you are in, and begin to boycott the large corporations that are controlling the food we eat and destroying the land that provides the necessities of life. Every region has qualities that allow for certain plants to be grown there, and each region must identify these qualities and plan their landscapes accordingly.

Auburn, Alabama has an excellent location to support its food needs through localization. It also has the opportunity to educate the generations of college-aged citizens passing through about the dire need to support local farmers and try to change the current lifestyle they live. The Auburn area has long been known to have valuable agricultural land, but unfortunately the pattern of settlement currently taking place is destroying much of that productive land.

Urban growth occurring in Auburn, Alabama

1939

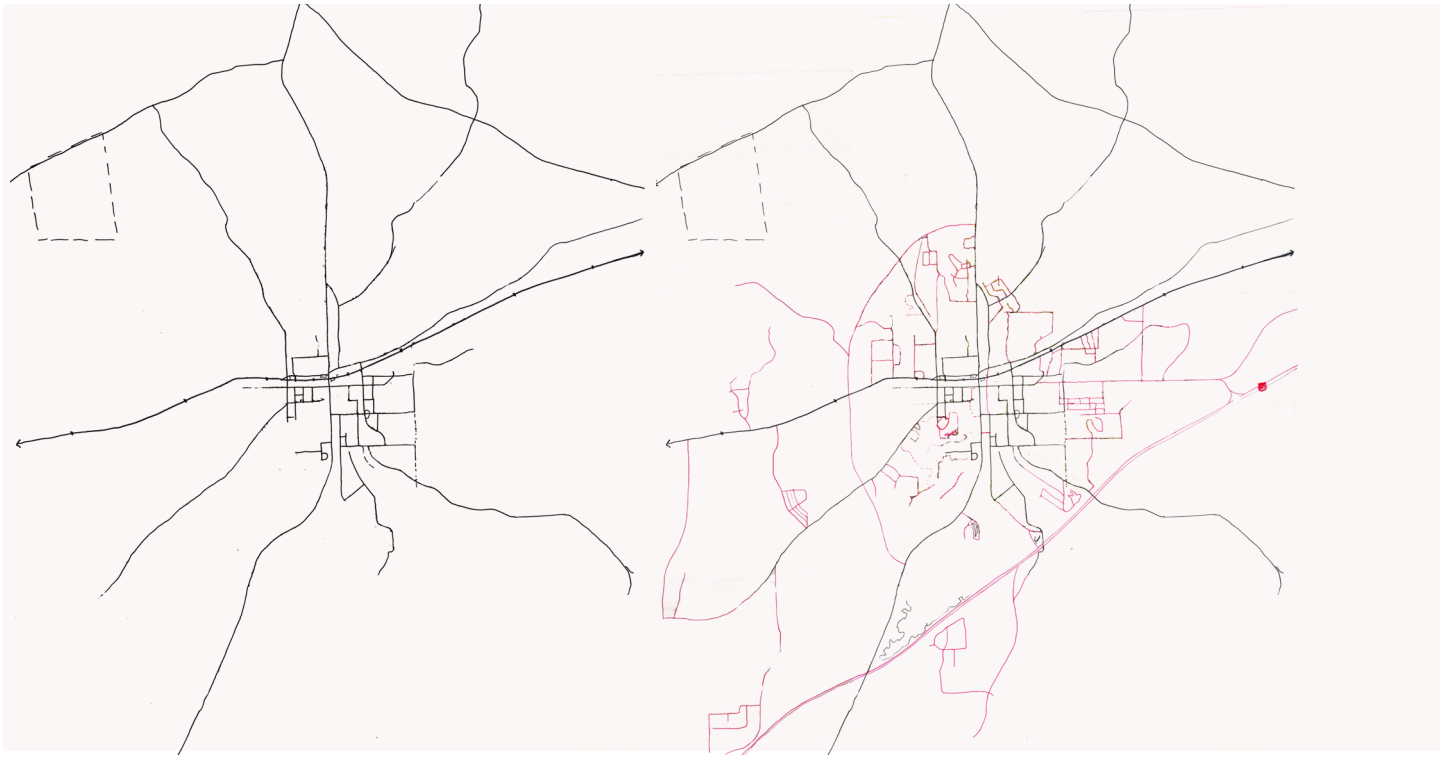
1978

2009

Figure 4

The city of Auburn has seen tremendous growth because of the University, and also because of its location along the I-85 corridor and the opportunities for jobs around the area (Logue 1996). This has meant that more subdivision neighborhoods have been popping up all around the city's core, often located on what used to be prime farm land.

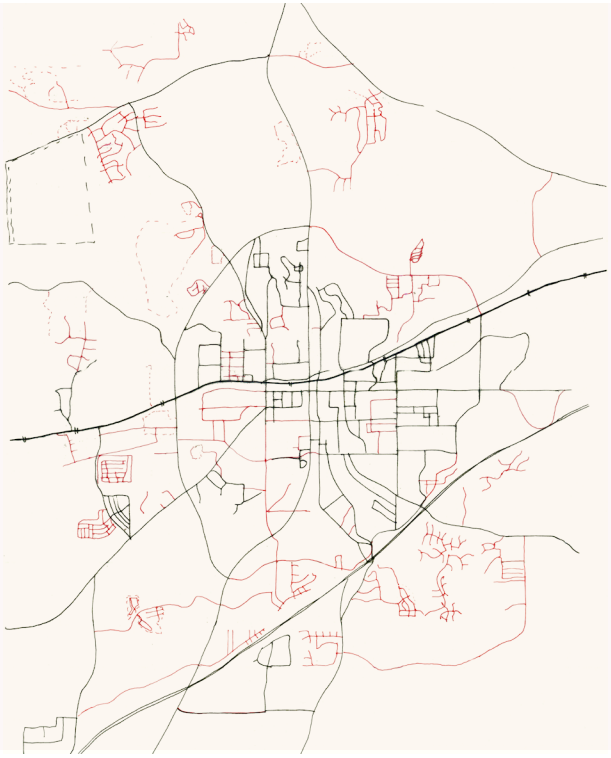
ILLUSTRATION OF ROAD GROWTH AND SUBURBAN SPRAWL



1939 1978

Figure 5 The development pattern in the Auburn area is demonstrated by the road growth over the past 80 years. The sprawl method of development is slowing circling the city.

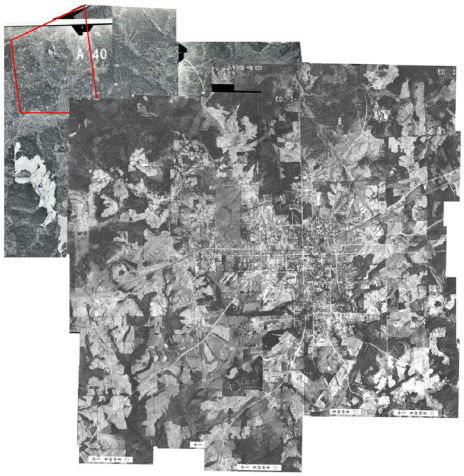
If this type of growth is going to continue, a better way to plan development must be inaugurated while simultaneously planning for a more localized Auburn future. These subdivisions can no longer be allowed to disregard the land they occupy, but should be required to analyze the land and specify areas of production within a neighborhood before laying out the parcel lots. This would help maintain a healthy community in the future, and lessen dependence on imported food products. If all small-scale neighborhoods were designed in a way that could support most of their nutritional needs on site as well as produce for others in surrounding communities, then that would be one step in overcoming the industrial agriculture that is controlling our food.



2009

Over the years, the vegetative cover in the Auburn area seems to have increased. As seen in figure 7, a study done from 1939 to 2009 reveals that the expansion of neighborhoods into the farmland helped to create some of that vegetative cover. Whether this vegetation is native woodland species or landscaped homes varies throughout the city, but the production potential of the farmland being consumed by housing as well as the woodland is not being taken into consideration when new development layouts are being created.

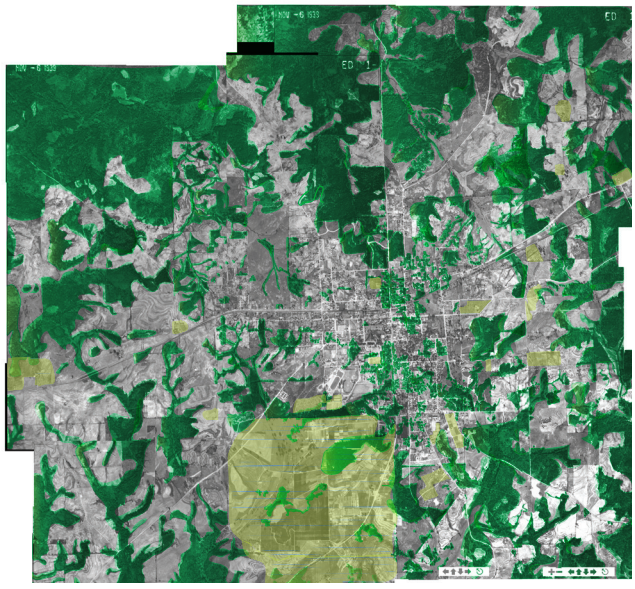
1939



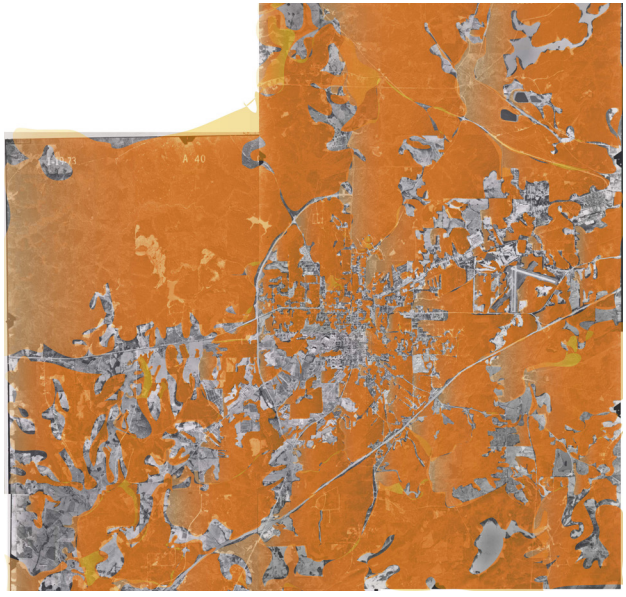
2009

1978

Figure 6
Historical aerial photographs showing the city of Auburn, Alabama. The proposed site is indicated in red. Photographs courtesy of Auburn University Library and Google Earth.



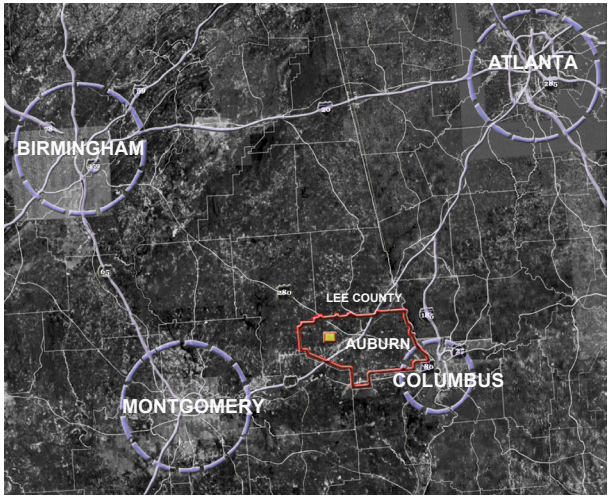
1939



1978

2009

Figure 7
The vegetation cover seems to be expanding over the 80 year span illustrated with the images.



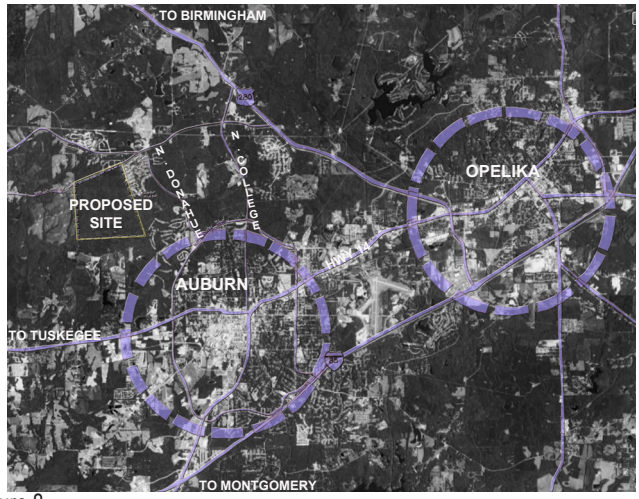


Figure 8

Context

The study site is located in Auburn, Alabama, which is in Lee County. The larger regional connection includes Birmingham, Montgomery, Columbus, and Atlanta. Neighboring Auburn is the city of Opelika, Alabama. Both of these cities are growing rapidly, and are continuing to merge towards each other in the pattern of growth they show.

Previously the study site has been harvested for timber, and used for hunting of wild turkey and deer.

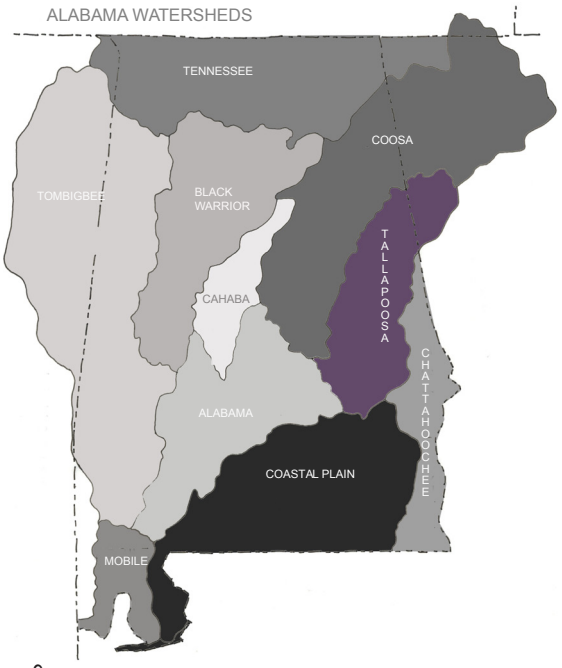
Site Selection

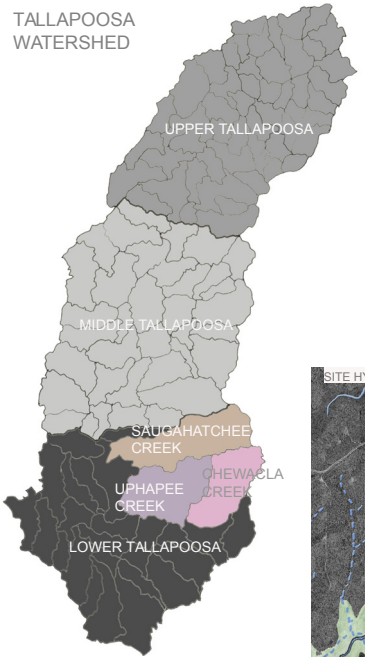
A technique was used which helped determine where the proposed site would be located within the greater Auburn area. Criteria for site location were developed which narrowed down the range of potential sites to a planned subdivision known as Samford Hills. The criteria, which helped determine this site, included:

A. Size of the community (smaller community within a larger core)
B. Large number of acres to sustain production and community
C.. Solar aspect
D. Running water source
E. Gently rolling slope
F. Rich environmental context (soils, AHS zones, native vegetation)
G. Proposed development plan already exists for site

This set of qualities was met by the proposed site. The most important criterion is the fact that the area is already slated for development, and the current development plan does not provide options for food production in its outcome. The site is located just north of Auburn on Mrs. James Road, approximately 4 miles north of Auburn University campus. It borders the Saugahatchee Creek to its south, with small streams running through the site into the creek.

The Saugahatchee Creek watershed is currently on the 303D list for the state. This list reveals the current water sources in the state which are contaminated and being monitored. The reason it is on this list is because of high levels of nitrogen and phosphorous currently found in the creek. Run-off enters the creek carrying chemicals and fertilizers. This is one of the biggest challenges in designing within this site. Currently there are two monitoring stations, one within the site and one right next door in the Ridge Grove subdivision. The Creek is 70 miles long and runs westward. (Saugahatchee Creek Watershed Past, Present, & Future 2005). See figure 9.





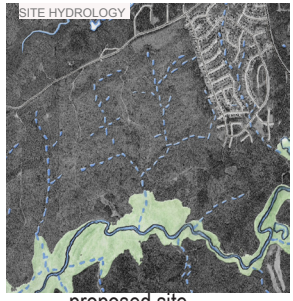
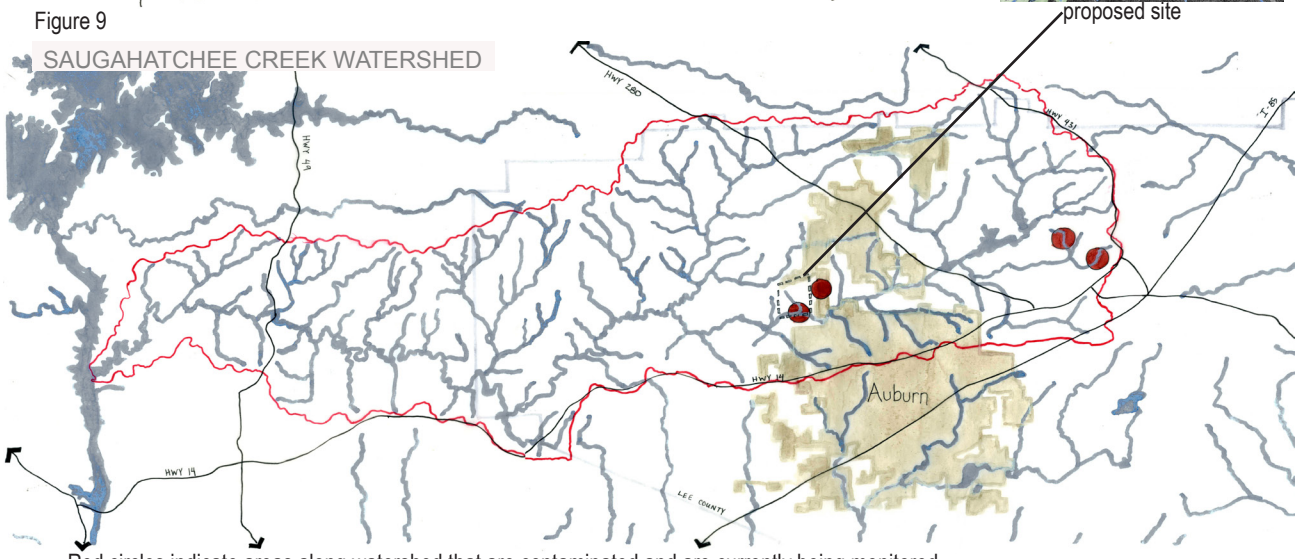


Figure 9



Red circles indicate areas along watershed that are contaminated and are currently being monitored. [1]

The hardiness zone for this part of Lee County, Alabama is a zone 7b. This gives opportunity for a wider range of plants to be used in the area, while helping to determine exactly what plants can tolerate the region.

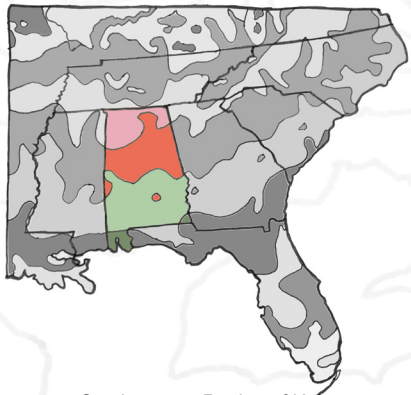
Hardiness Zones

Figure 10

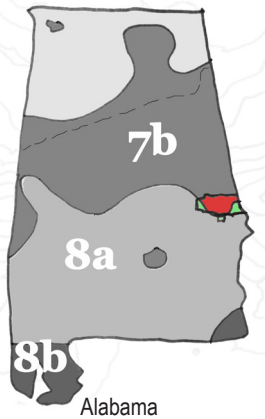
Average Annual Minimum Temperature for the Lee County/Auburn area is:

7b- 5 to 10 F
8a- 10 to 15 F

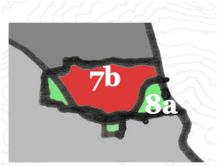
An updated hardiness zone map now reveals the entire county to be a zone 8.



Southeastern Region of U.S.



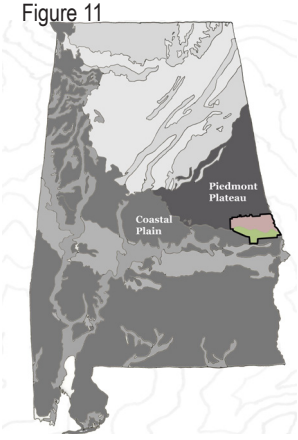
Alabama



Lee County

Soil Analysis

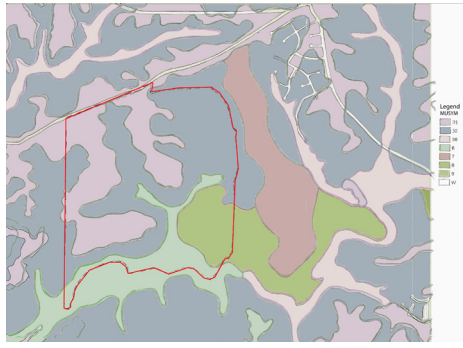
Figure 11



Alabama

There are four types of sandy loam found on the proposed site. Loamy soils are suitable for agricultural production.

Lee County



Proposed Site

Existing Site Conditions


pecan


sumac spice


shortleaf pine


hickory


wax myrtle


sweet gum

Existing vegetation found on site. Other vegetation includes: wild muscadines, persimmon, osage-orange, oak species, sycamore, and a variety of under growth species

Remains of an old fireplace found on site

Vista towards Auburn to the south west from the highest elevation on proposed site

Open field

Native grass

Looking towards the south

Looking towards the north

Plant Selection

The plants proposed for the project were chosen based on their performance and requirements within the Southeastern region of the United States and to match the capability analysis of the site. The plant selection includes: pecans, figs, muscadines, blueberries, strawberries, wheat, as well as a rotation of winter and summer annual crops. The requirements and maintenance of these plants will be discussed further in the chapter. The market for these plants is substantial, so an increase in supply would allow more people to have access to these locally produced goods. By incorporating sustainable agriculture techniques of production into the community operation, the soil within the site will not be degraded by the production process. This will actually allow for more biodiversity within the soil. The land capability will continue to be viable because depletion of soil minerals is not occurring in the farming operation.

The plant selection, as mentioned above, have been chosen because of their qualities for being produced in the Southeastern United States. The grain crops would vary according to preferences of the village and would be rotated in areas of annual summer crops. The grain crops will be winter annuals and will allow for production areas to change seasonally. This will allow the village to have variations in the landscape rather than having an entire landscape which is constantly the same crop. The annual crops will be able to rotate seasonally along with the grain crops, but in some areas they will remain year round. The type of summer and winter annual crops will vary according to personal preferences. Some of the maintenance associated with this type of cropping would include seasonal plant change outs, tilling, soil amendments, fertilizing, harvesting, pruning, weeding, scouting, and mulching beds as well as pathways. The annual cropping will be the most work on a seasonal and yearly basis. Next, the remaining plant selections will be discussed in detail.

Pecan- *Carya illinoinensis*

• Zones: 6-9

• Maintenance: Fertilize, rake leaves, harvest

• Description: 75-100' tall deciduous tree; place in full sun; non-showy flowers; compound leaves that are medium green; edible nuts during fall; good shade tree with extensive root system.

• Soils: prefer sandy loam soil texture and clay subsoil; idea soil pH 5.8-7.0

• Spacing: plant trees approximately 45' apart from trunk to trunk

(Wells 2009), (Creasy 1982)

Fall Color

Photo courtesy of www.dirtdoctor.com

Muscadine- *Vitis rotundifolia*

- Zones: 4-10
- Maintenance: Prune, harvest, scout
- Description: up to 50-100' woody climbing vine (kept at about 5-12'); deciduous; place in full sun; blooms in spring with non-showy flowers; harvest in early fall
- Soils: prefers to not have water table near the surface of soil;
- Spacing: grown on trellis which can vary in length and height; planting should be placed no lower than 50' below the base of a slope

(Creasy 1982), (Himelrick and Dozier 1996)

Photo courtesy of msucares.com

Fig- *Ficus carica*

• Zones: 8-10

• Maintenance: Fertilize, harvest, rake leaves/fruit, prune

• Description: 15-30' tall deciduous tree; place in full sun; non-showy flowers; edible fruit harvested in summer and fall; yellow fall color

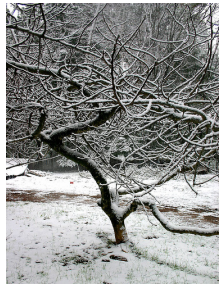
• Soils: prefer medium to poor soil with good drainage for best fruit; restrained roots force the tree fruit more successfully; lime should be added to acidic soils

• Spacing: plant trees approximately 15' apart if they are to be maintained; 30' if no sizing maintenance will be performed

(Creasy 1982), (Himelrick 1999)

Fall color

Photo courtesy of Randle Farms



Strawberry- *Fragaria x Ananassa*

- Zones: 3-10
- Maintenance: Fertilize, water, harvest, weed, scout, re-plant every 3 years, control runners
- Description: 6-12” perennial; place in full sun; small white flowers in spring, edible berry fruit in spring and summer; fruits after second growing season
- Soils: prefer well drained soil with high organic matter; slightly acidic soil preferred with a pH between 5.0-6.0
- Spacing: planted approximately 18-24” apart in rows, usually have landscape fabric underneath plants for easier harvest and rot prevention

(Himelrick, Powell and Dozier 1996), (Creasy 1982)

Photo courtesy of www.justgrowit.ca

Photo courtesy of www.gardenfine.com

Rabbiteye blueberry- *Vaccinium Ashei*

- Zones: 3-9
- Maintenance: Fertilize, mulch, water, prune, harvest, soil acidity; scout
- Description: 4-10' deciduous shrub (up to 20' in wild); canes have productive life of 7 years; requires cross-pollination for fruit; place in full sun: winter chill of 350-800 hours required; red fall color
- Soils: prefers light soils with very high acidic qualities, a pH of 4.0-5.2 is needed
- Spacing: plant shrubs approximately 12-14' apart

Fall color

Photo courtesy of www.sites.aces.edu

(Creasy 1982), (Musgrove 1997)

Spring flush and flowers

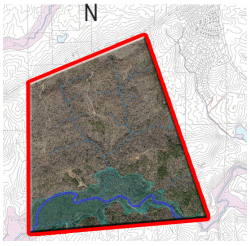
Contour planting of blueberries

Photo courtesy of Randle Farms

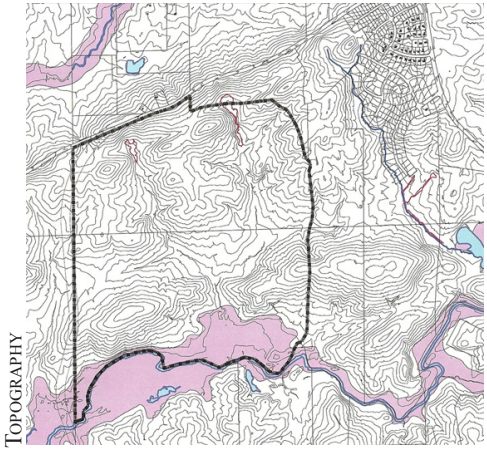
Chapter Three: Design Methodology

The design process attempts to discover the best possible way to exploit the productive capacity of the land and allow for residential occupancy at the same time. Initially, the process began by identifying the types of usable land on the site. A soil survey map revealed areas of slope percentages that would be most suitable for production. The soils found on the site were four variations of sandy loam soils, and loamy soil types are very suitable for agricultural growing (McNutt 1981). A Lee County prime farmland map was also examined to locate areas suitable for production. These areas coincided directly with the soil survey of the site and allowed accurate locations for agriculture to be determined. The residential areas were located in relation to the agricultural production, but as I will discuss later in the text, these areas were not determined until further along in the design process.

HORTICULTURAL INVESTIGATIONS



Site Aerial



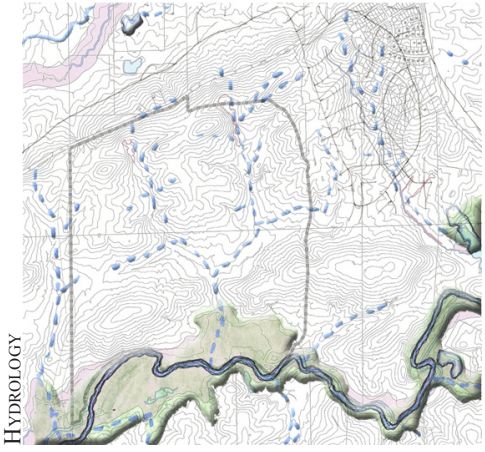
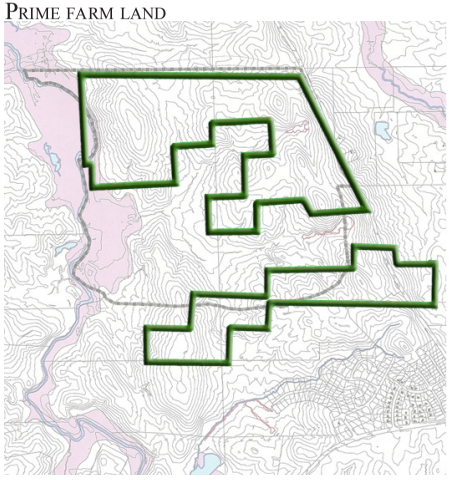
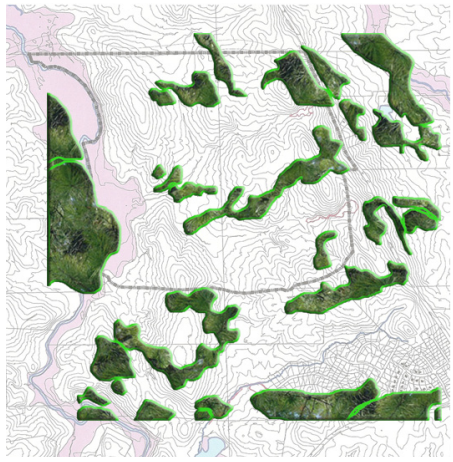


Figure 12

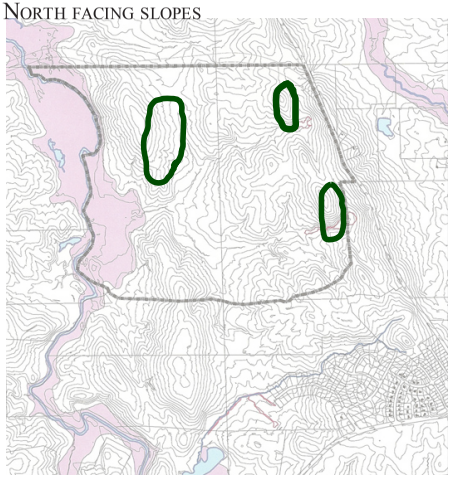
Prime farm land



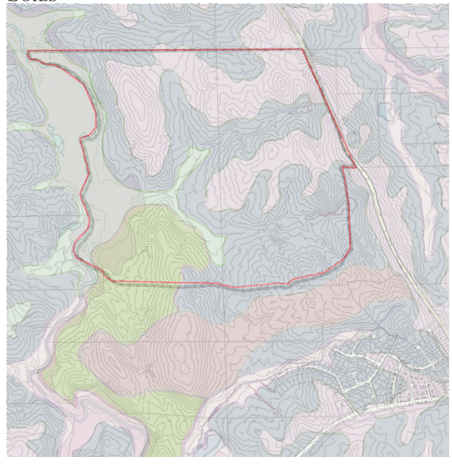
Evergreen Vegetation



North facing slopes



Soils



Land Capability

Figure 13

The land capability map, Figure 13, shows the previous illustrations combined. This map created the base for the entire design by laying out the framework of production possibilities on the site initially. By designating the capability of the land first, the decisions following had a strong foundation to build upon. Areas shown with a striped green pattern are prime production areas. This is where the cropping for mainly perennial crops would occur. Areas in the solid shade of light green are native Alabama soils but are not prime for farmland. Areas in blue represent the streams and low lands found on site. Areas of light patches are suitable for orchard cropping, with buffer vegetation placed to the north east. The area in pink represents the flood zone surrounding the Saugahatchee Creek.

Once the agricultural areas were located, the cropping patterns within the site were created. The areas of cropping were determined by the soil analysis, prime farmland, solar aspect, and topography. Blueberries were located in the areas that consisted of sandy loam soil and had the least amount of slope percentages. Pecans were utilized as a transitional plant because of their tolerance for a variety of site characteristics. Although pecans could be used throughout the site, they were mainly located relatively close to the streams, and in areas where water filtration techniques could be incorporated with the pecan production. The orchard crops were located on the north facing slopes to prevent frost damage during winter months (Powell 1999). Annual cropping was incorporated in areas of optimal soil conditions, but also could be designed into the soil areas that were second best for production. This is possible because for annual cropping, soils would most likely be amended on a season-to-season basis. The muscadine production was situated on the upper parts of the hills, as this type of production prefers to be about 50' up the base of a slope (Himelrick 1996). The overall agricultural design was drawn out on the basis of the production techniques discussed in the previous chapter.

Cropping Patterns

The overall agricultural design, illustrated to the left in figure 14, demonstrates the most sustainable ways to harvest the land. The crop requirements were all analyzed and placed according to the best management practices associated with the particular type of cropping. Once this cropping pattern was established, the dwelling placement could begin to emerge within the cropping. This cropping pattern helped to establish a foundation for creating central node areas within the landscape, as will be discussed later in the text.

Figure 14

• Cropping patterns were determined based on the land capabilities map. The areas of crop production were located in sites that were best suited to the particular crop requirements.

• The blueberry crops were located in areas with prime soil conditions. This was done so that minimal amendments would have to be made for the blueberry crops.

• The muscadine vine crops were located in areas 50' up the base of the hills. These types of crops prefer to be a bit higher up in elevation.

• The strawberry bi-annual crops were located along slopes because they are a good ground cover crop and soil stabilizing crop. These crop locations can be rotated every two years; which will allow for an ever changing landscape.

• The pecan cropping was located in areas that were less suitable to other types of production. Pecans are native to the area and therefore can tolerate various conditions. They were used as somewhat of a transition plant throughout the site; and to aid in water filtration from the roadways.

• The annual vegetable crops were located in areas with less then prime soil. This is because these areas will be amended yearly for the crop production, so the soil will build good organic quality.

• The orchard crops were located on the north facing slopes. Orchards must be placed on north facing slopes to avoid frost damage in the winter. The woodland vegetation is also used as a buffer for the orchard crops; with 75' cuts every 100' of woodland.

• The woodland can be used to harvest timber for construction and best forest management; and also these areas can be used for seasonal honey production.

Housing Layout

From this point, the housing analysis and placement process began. Initially the process examined the current parcel layout proposed for the site. This layout was done by the KPS Group in Birmingham, Alabama. With the configuration of housing and green space that they proposed, there were approximately 1,078 lots parceled for the site. This was used as a base number that the research layout should match, as this would ensure that the site was being used to the full potential of its original plan. Ideally, I would try to increase the density by having a variety of housing types located on the site. See Figure 15.

The process used to locate the housing began with a cut and paste method developed to incorporate the housing into the agricultural production. The working scale for this was 1 inch to 100 feet. The building footprints were determined, then buildings were cut at the scale and various housing schemes attempted. These housing schemes are discussed in detail further in the text. The buildings were initially placed with only the building footprint as the base; then the lot sizes were determined which helped to create a more spacious dwelling layout.

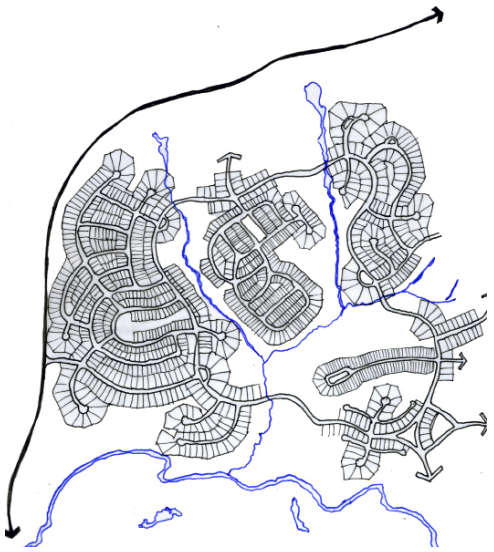


Figure 15 Parcel layout plan done by KPS Group

Figure 16

Scheme 1 is based on aspects of the traditional style neighborhood development pattern. The variety of housing provides mixed income opportunities for families to live in this village.

Evaluation

- The houses are not oriented according to solar aspect (road/home going east-west) principle.
- This scheme follows the same pattern as the agricultural landscape with the roads and homes becoming the horizontal rows
- Town home and apartment areas are holding 30 units/acre, while the single family areas average about 10 units/acre

Key
Green = med/large single family unit
Blue= small single family unit
Grey = cottage units and duplex units
Purple= multi family town home units
Red= multi family apartment units

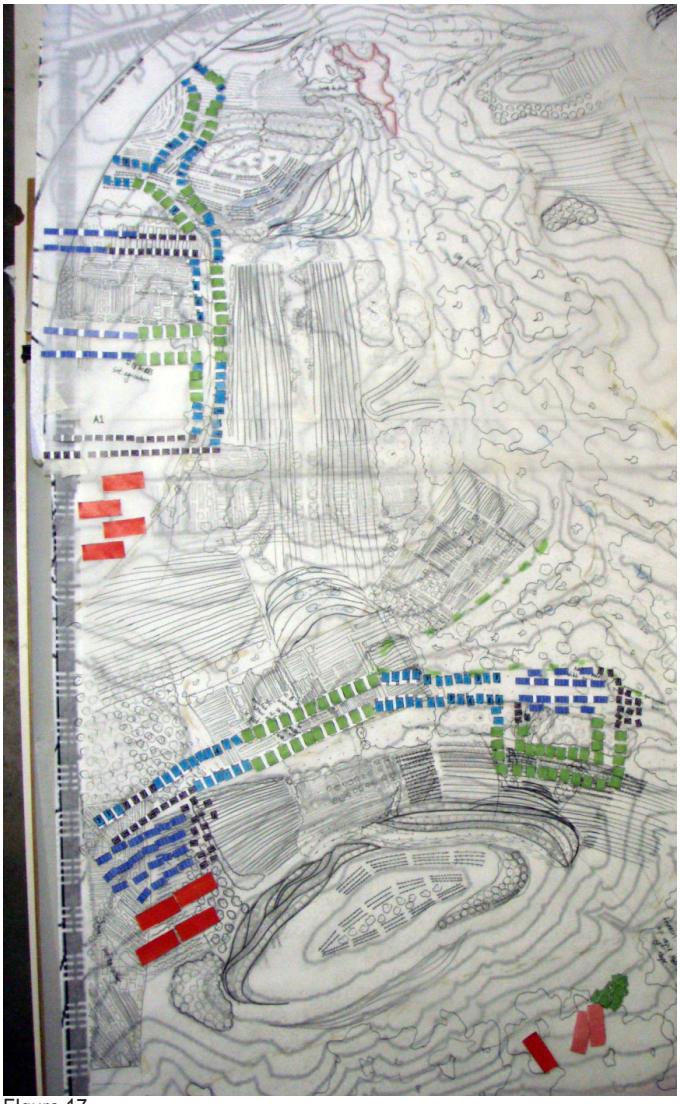


FIgure 17

Scheme 2 illustrates the housing being placed within the agricultural landscape based on the agricultural structure.

Evaluation

- This design worked well with the east-west orientation. The houses were located into parts of the landscape where it would be feasible for road construction and not too invasive on the plant production.
- Some areas where cottages are clustered will not have paved road access but gravel roads and parking lots.
- Areas where production may not be best (like drainage points off the slopes) were looked at and considered as housing opportunities.
- Units per acre may have slightly decreased with this scheme, but there is still an increased density.

Scheme 3 was created by placing roads within the agricultural landscape first and then following with the layout of the housing. The roads were located based on the nodes and were used as a means to connect these places of interest.

Evaluation

- This layout has started to open connections between the different neighborhoods rather than keeping them separate from one another.
- The housing types seemed to be clustered together in this scheme which is not the ideal layout in traditional development.

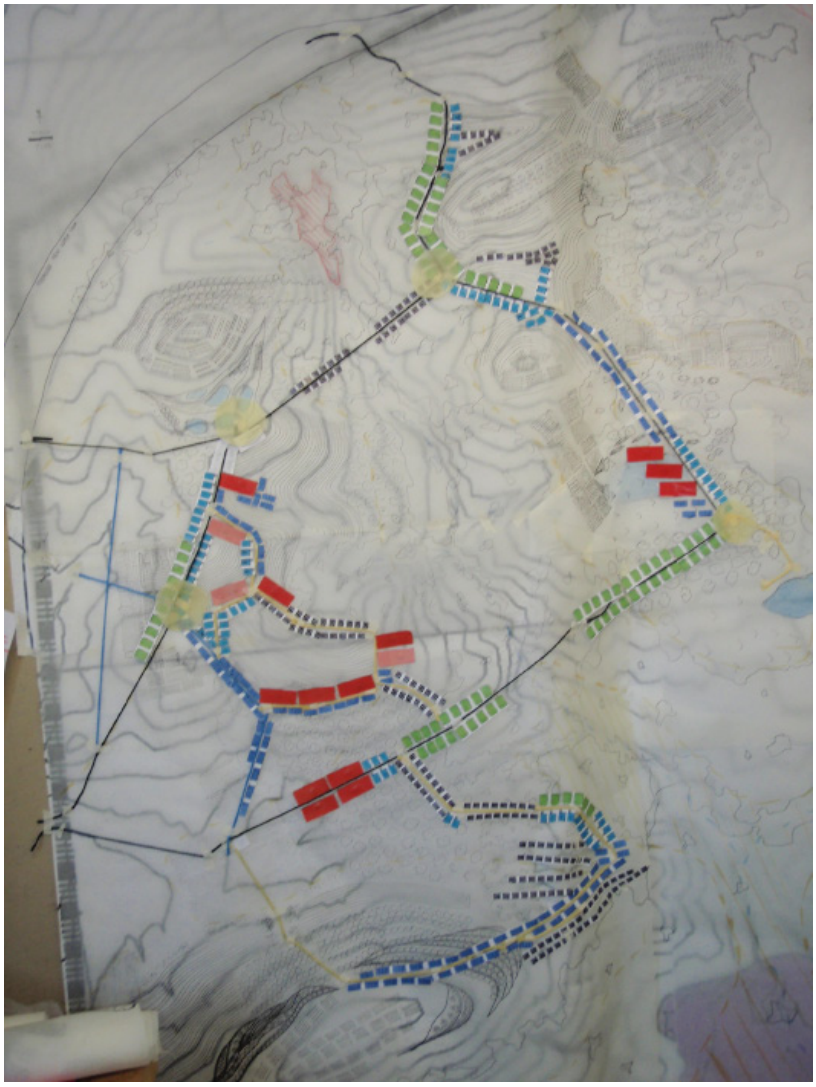


Figure 18

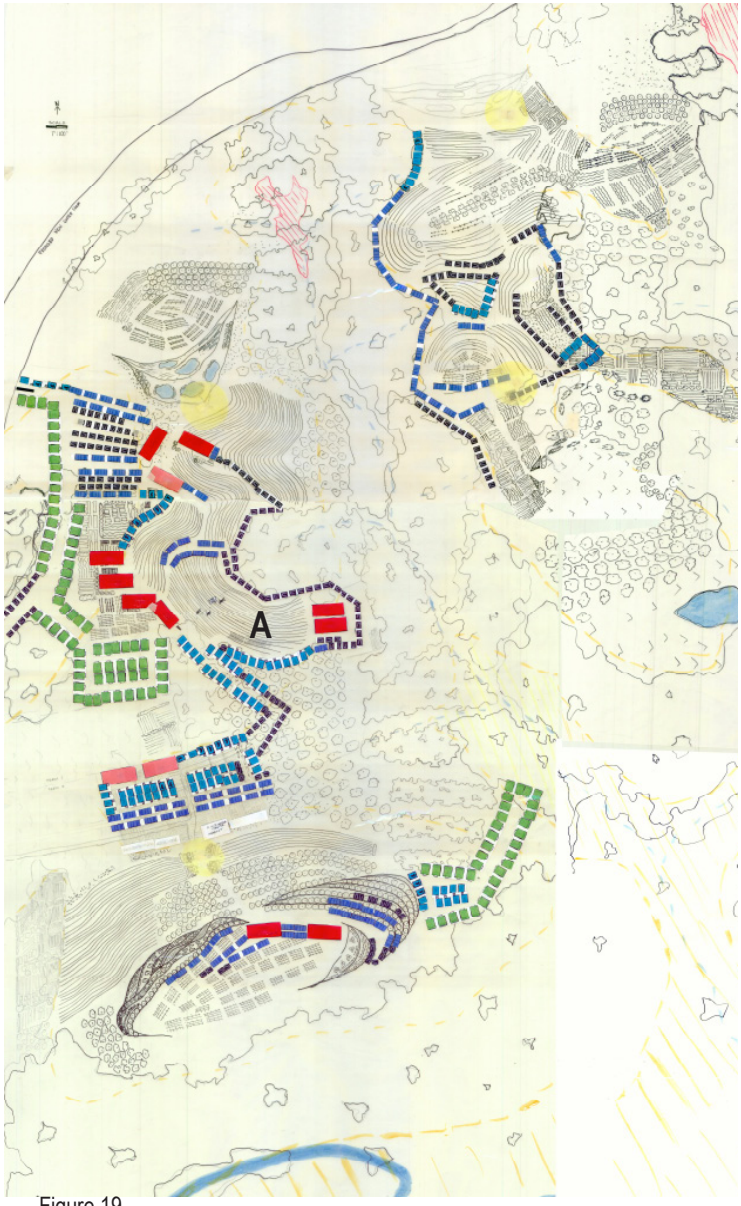


Figure 19

Scheme 4 Nodes of key agricultural locations were identified first, then the housing neighborhoods followed.

Evaluation

•Many problem existed with this plan. The hierarchy of roads did not properly organize the site, and dead end roads did not promote connectivity throughout the site.

•The grouping of the houses was a problem as well because the same types of houses were located together and not mixed in with other types of housing.

IMAGES REPRESENTING AREA A ON SCHEME 4 MAP

Figure 20

Perspective view within the agricultural and residential setting of scheme 4 at point A

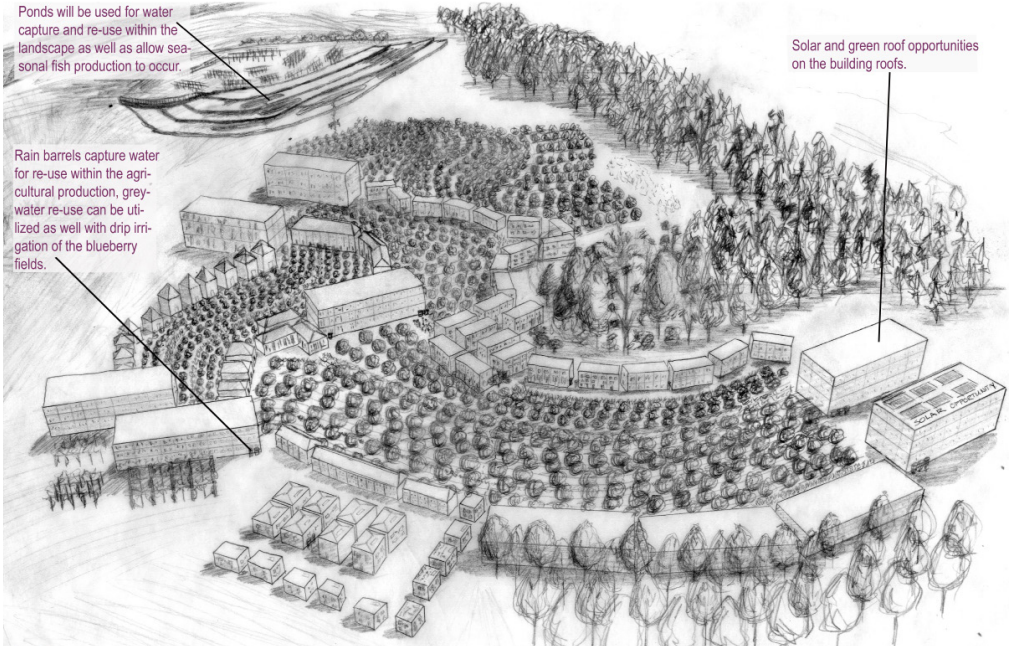


Figure 21

Illustrative aerial view of proposal for site looking north from point A in scheme 4

After many attempts I began to realize that this process of design was not working successfully for three reasons. The lot sizes were not taken into consideration; only the square footage of the building was being used in the design process. Also, there was no hierarchy of roads or zones within the plan.

The next step, in order to move forward with the entire design, was to locate key nodes within the agricultural areas and create a hierarchy of areas from those node locations. Precedent studies were done, looking at medieval town development and Roman hill top towns. These studies revealed that certain characteristics of these towns helped to shape the organic patterns of their development (Kostof 1991). The Roman hill top towns, for example, had main nodes that were located at its Churches. Initially, the Churches were some of the first buildings within the town. Next, as Churches were located certain distances from each other, roads were formed which linked all the Churches together; making them the nodal points for the road network. The city was built around this, but the Church nodes linked the main road structure and social areas. Some examples of medieval and Roman settlements are illustrated in Figure 22.

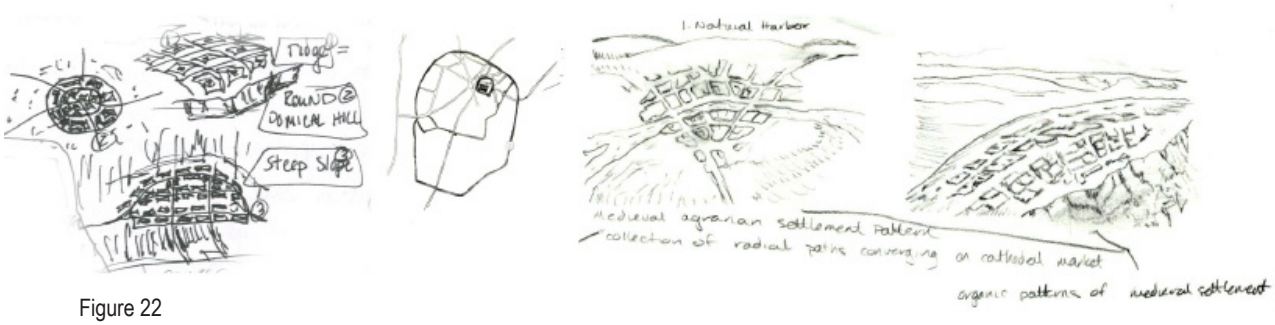


Figure 22
Case studies were done looking at organic settlement patterns of landscape, infrastructure and housing all growing together. This led to an investigation into how medieval and Roman hill top towns were settled. The idea of creating nodes and then connecting them was taken from the layout of Roman Cathedrals and it proved to be a successful element to the design.

In looking at this precedent, I began to realize that the circulation on the site needed to have a strong foundation. The nodes of the site, which would create this foundation, were located where different types of agricultural production and landscape processes came together. The spaces that these intersections created then became open areas-like plazas in a Roman town. From there, the circulation within and through the nodes was analyzed, along with the overall circulation throughout the site.

Illustration of Node locations

Figure 23

Three initial nodes were located based on the patterns of merging agricultural operations.

Road hierarchy is also illustrated. The darker red being primary roads, secondary roads are lighter, and dashed lines represent tertiary roads.

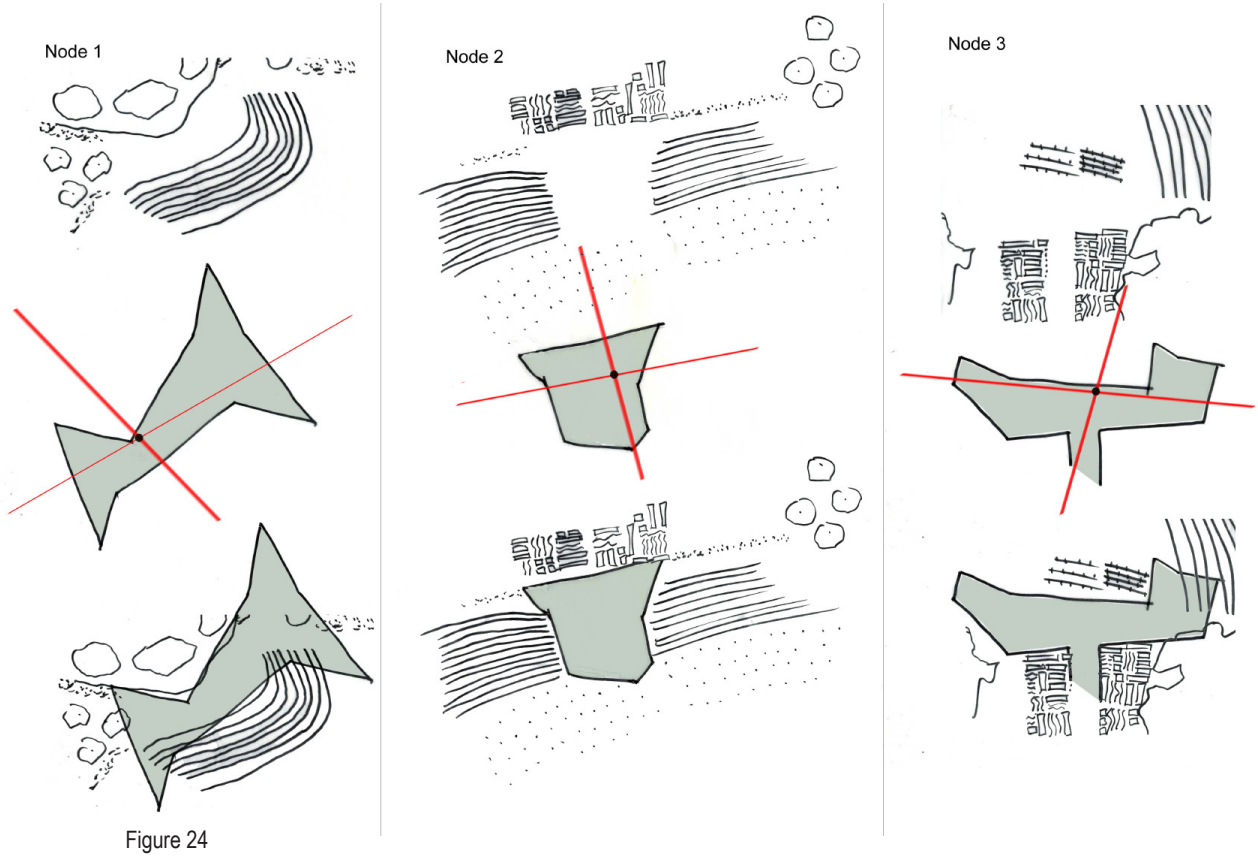


Figure 24

Nodes are identified and located according to the cropping patterns set up initially. The spaces that were created between the production became the nodes. The nodes then became anchoring points for the road network, similar to how Roman development occurred with Churches as the nodes.

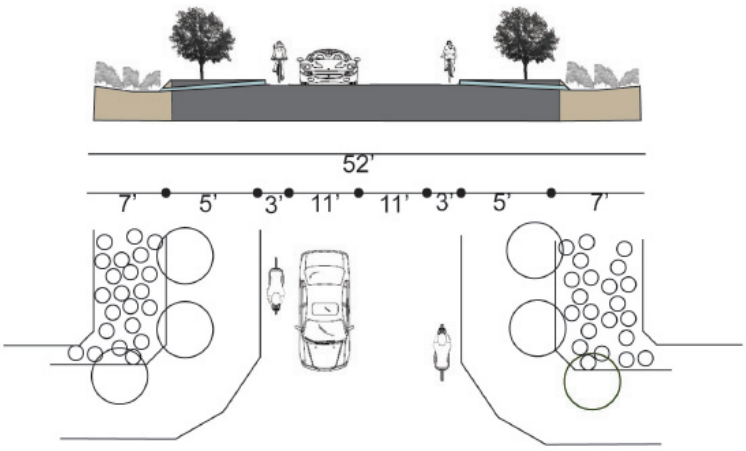
The gathering that will occur at these nodes will include small plaza like spaces with shops and dining, as well as a community center and farm resource center. The spaces that get people to the node should provide clear circulation and social interaction areas among the production

When the nodes had been successfully located, the circulation and road network became more apparent. A hierarchy of roads was also created to distinguish different areas of the community. The primary roads are the main roadways that take one throughout the site. These roads are paved and include bike lanes, sidewalks, and storm water management through incorporated bio swales. The bio swales, in conjunction with grading away from the roads, allow for storm water management to occur without the need for gutter collectors (Corbett 2000). The secondary roads are also paved, but are smaller in size to prevent speeding. As mentioned, these roads also have sidewalks and bike lanes, depending on the location of the road. Also, some of these secondary roads may be one-way streets, but the main use of secondary roads is within the residential areas. The tertiary road network consists of dirt or gravel roads. This allows for more of the surface space to be permeable. These roads will need to be maintained to a certain degree to prevent erosion, but the added benefit of storm water management will justify the use of these types of tertiary roads. See Figure 23 for illustrations.

Once the nodes and circulation were designed, the next step was to re-consider the housing layout. As I have mentioned, the original method used to layout the housing, was only taking into consideration the building footprint. When I evaluated this proposed method it was not sufficient in giving homes the spaces they may desire in a neighborhood setting. Therefore, lot sizes were established for each size dwelling by studying typical lot sizes of similar community settings and allowing the design to move forward from there. See Figure 26. A few of the precedents researched included Hudson Farms, Serenbe Community, and Village Homes. These communities are all relatively similar and provided a base from which the design could be built. Housing types included: medium to large homes, small homes, duplexes, town homes, and cottages. These types of housing units were incorporated into the design; with each size

STREET SECTION ANALYSIS
Figure 25

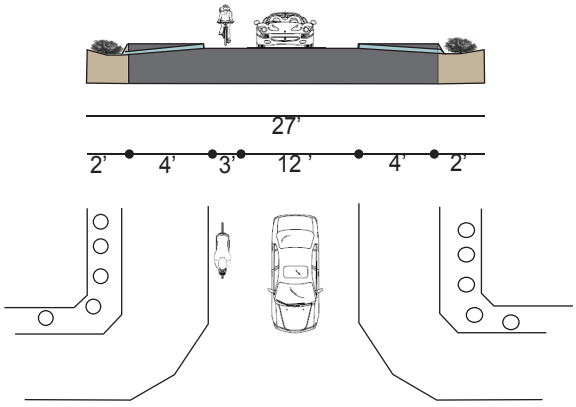
Typical Primary Street Section



Section shows drainage going underneath sidewalk to bio swales. As the grading continues to slope away from the road the water will flow into the pecan groves and be absorbed by the legume cover crops or into natural vegetation areas.

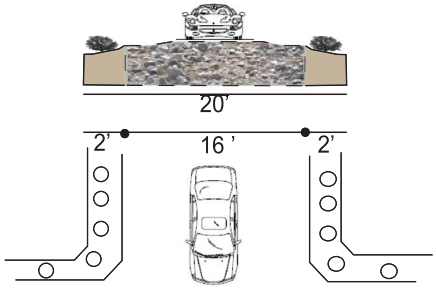
Grading away from road will allow natural drainage into backyard swales

Typical Secondary Street Section



Section illustrates drainage going underneath sidewalk to bio swales. Secondary streets may be one-way or two-way depending on the functions occurring in the specific area of the site.

Typical Tertiary Street Section



Section illustrates gravel roadways. These roads will allow natural storm water management. The tertiary roads will be used primarily in the woodland production area and in alley ways between certain residential areas.

dwelling unit having proportional lot space. Town homes and cottages having the least amount of lot space would be balanced by giving these types of residential units other amenities like frontage along the blueberry fields, or proximity to designated community-gathering spaces. After the housing, retail, and community centers were all established within the plan, a more detailed analysis could begin. As I will describe further in the text, by focusing in on certain areas a more detailed analysis could be accomplished that begins to explore exactly how the community would function socially with the landscape.

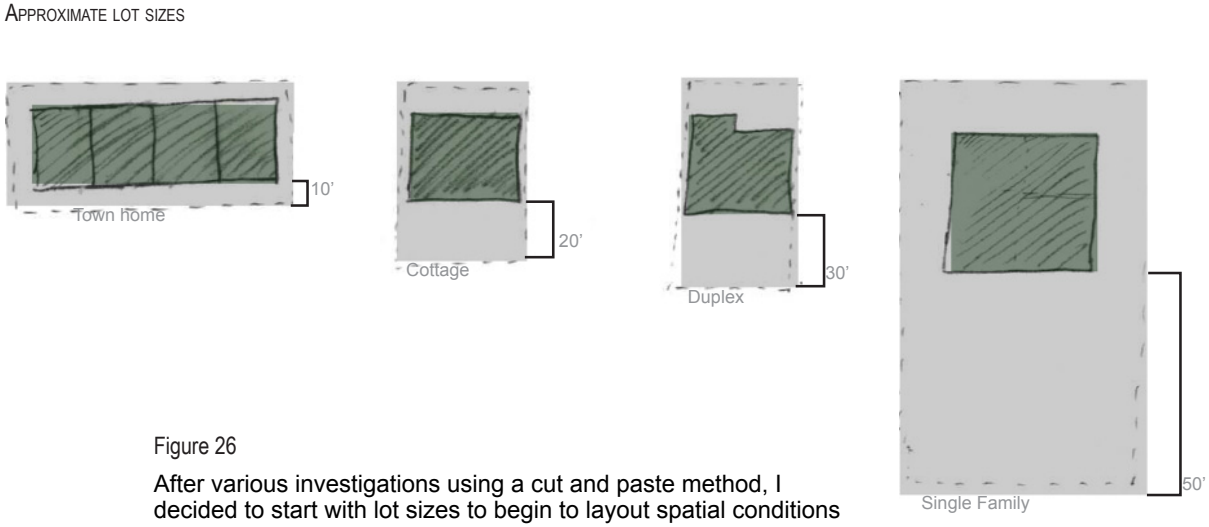


Figure 26

After various investigations using a cut and paste method, I decided to start with lot sizes to begin to layout spatial conditions within the housing units more accurately. The smaller lots are given to the town home (attached homes) because they will be located in areas accessible to other types of amenities.

“I have often thought that if heaven had given me my choice of position and calling, it should have been on a rich spot of earth, well watered, and near a good market for the productions of the garden. No occupation is so delightful to me as the culture of the earth, and no culture comparable to that of the garden… I am still devoted to the garden. But though an old man, I am but a young gardener.”

Thomas Jefferson

Chapter Four: Design Theories

The theories behind this design and thesis project address issues that have been building up for centuries in the United States and now have grown to become global issues. Underlying the whole design is the necessity of localized food production which explores the idea and need for food production to be local, and the detriment of mass production to ecosystems globally. Designing with sustainability in mind is something that only occurs some of the time. More often, developments are constructed without ever considering the true potential of the land. If we planned areas of development more strategically, we could create communities that rely mostly on themselves for their daily necessities. Food is an essential part of all peoples' daily lives, and with industrialization at the forefront of this nations food production, those people's lives are being changed radically. Physical health issues and food safety are just two of the ways people have been paying the price for industrialized food (Rice 2009). No one truly knows what the future of this process holds. Furthermore, newly created chemicals to combat disease strains have emerged and are going into people's bodies now, and the effects of these chemicals may not be seen or realized for years to come. We therefore need to start changing the way we live to avoid facing these imminent consequences.

Traditional neighborhoods are ones that have thrived for hundreds of years. These towns and communities were planned with people in mind, not cars (Duany 2000). Duany explains, the neighborhood "represented by mixed-use, pedestrian friendly communities of varied population, either standing free as villages or grouped into towns and cities --- has proved to be a sustainable form of growth." (Duany 2000, 4). The other form of growth is the "suburban sprawl" pattern (Duany 2000). As mentioned previously, "…suburban sprawl is an idealized artificial system" (Duany 2000, 4). This artificial system is taking over the land that could provide a link to another system, which is now being

produced as well. That system is the production of food. As mentioned in the previous paragraph, the mass production of food is the form that societies have chosen to accept. If we took these two systems: the "idealized artificial system" of suburban sprawl and the "industrialized artificial system" of food production, and realized that two burdens could be solved with a few key decisions, then maybe the growth of our nation could occur in a more sustainable and dependable manner. The theory of creating neighborhoods within agricultural production is something that was occurring as settlers first came to this country. Although the population was not as large, these small farming towns survived on the land. I think the possibility of accomplishing this again is very real, and if new developments are going to continue, then there is no reason for food production not to be considered as an initial step of the development process. Agriculture and modern culture must therefore merge for the greater good of all people.

As that step is being addressed, aesthetic qualities can also be considered with production. Most communities are set up in a way that appeals to people aesthetically. This is a concept which should not be ignored when designing a community based around agriculture. There are many agricultural landscape scenes that are aesthetically pleasing, and setting up a community around these scenes is one way to allow maximum appreciation for what is actually occurring on the land. Aesthetic qualities also come from the change of season and change of scenery. As plants go through the different phases of their life cycles, humans can enjoy observing various aspects of life and death within the landscape. There is also somewhat of a formal quality that comes with an agrarian landscape. The order and unity of this can also provide aesthetic inputs for people to enjoy.

Figure 64 Diagram of Community Work Practices demonstrates the efforts needed to support community integrated agriculture.

“What we need is community integrated agriculture.”
J. Hanes

Chapter Five: Final Design

The master plan was designed after all the site analysis and theoretical framework was considered. The design addresses all the issues previously mentioned and creates a proposed community that is situated within an agricultural farm. The residents of the community become involved with the farming by buying shares of the production. Each dwelling unit will be given the choice of buying into a program that will maintain the agricultural production and divide the returns among investors. Residents will also have an option to buy a full maintenance package of all cropping, including annual vegetable cropping. If the residents choose not to buy into this package, they will be responsible for maintaining their own annual plots. The planting of the tree, orchard, shrub, and vine crops will be done in phases, this will help to keep shared costs at a reasonable price as the community establishes itself during the initial years. Once the production reaches its full capacity, the return to investors will continue to increase yearly. This will give home owners an added benefit of increased real estate value because of the well established production amenity found within the community. Since the home owners would be investing in the operation from the very beginning, they will be more inclined to be involved in its success. This will help to establish a symbiotic relationship between the home owners and the farmer/farm workers. Both groups are striving for the same goal, therefore a strong balance will be achieved within the community.

There will be two types of production occurring within the site. The first type is managed production, and the second is non-managed production. Managed production will include the types of cropping mentioned in chapter 3 and will be heavily maintained to encourage maximized potential. Non-managed production will include the woodland areas; these areas will be used for wild harvesting, production of honey, and timber harvesting. This will open up more possibilities for seasonal production during the off season of the managed cropping.

Figure 27

The collection of water can be used in this gravity enabled terrace system. This would supplement the water needs of the crops.

Neighborhood pockets integrate single and multi family dwelling units.

Woodland node provides opportunities for honey and timber production. Low impact housing options could be considered in this area.

Community center located central to all neighborhoods.

Small commercial center located near largest neighborhood pocket

Neighborhood located along proposed outer loop.

Multi family dwelling units will have cropping frontage as an amenity, rather than larger lot space. They will be provided with common areas which will be used for annual cropping.

Community area will allow for large community gatherings and is located directly across from the community center. The pond will allow for water retention before entering the creek.

Farm Center located central to five main areas of production. This allows easy access but limits pedestrian movement directly through the farm.

Commercial residential node provide the main market place for all the neighborhoods.

Neighborhood located on the slope enjoys vista amenities and cropping frontage. These multi family units trade lot size for such amenities.

The master plan for the site attempts to combine all previous processes to create a design that incorporates communities into the agriculture.

Further in the chapter central areas of the master plan will be explored in more detail.

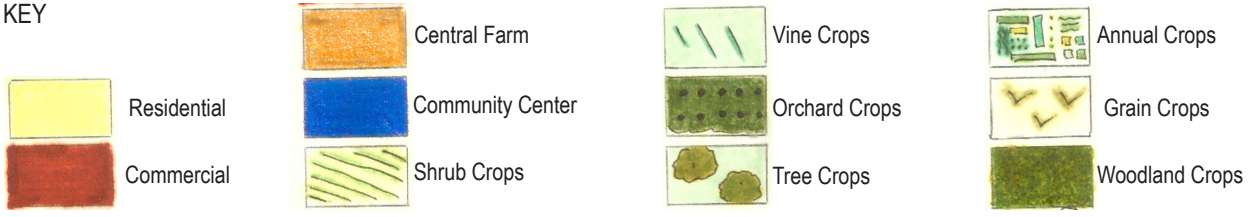
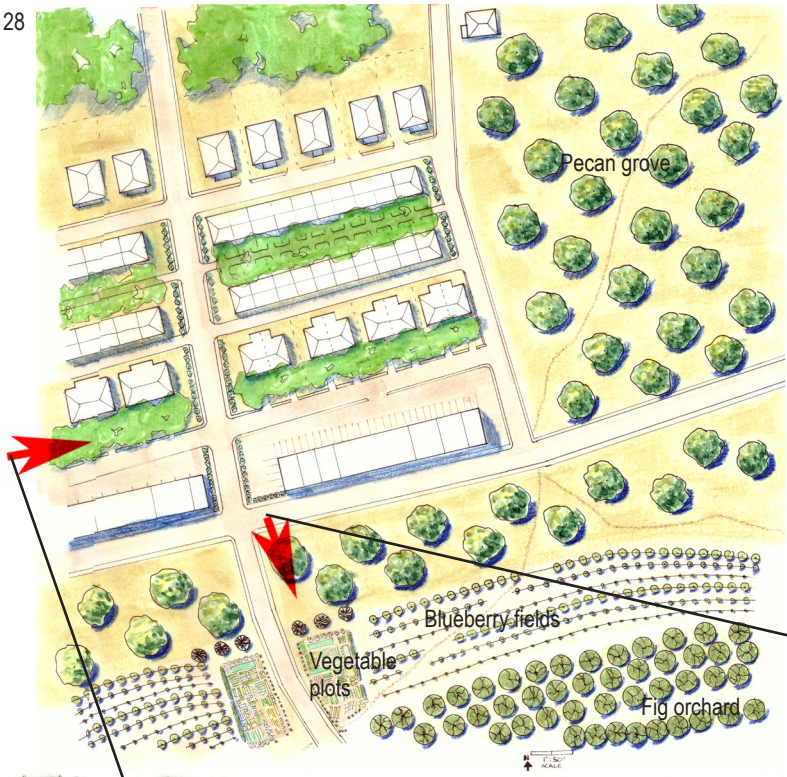


Figure 28



The main commercial node illustrated here shows a mix of dwelling, retail, and production. The orientation of the dwellings is an east-west orientation for solar aspect and following the spatial corridor of the pecan grove. Pedestrian paths are designed with the intention of more paths developing over time as pedestrians choose their own routes through the production. In the pages following, illustrations showing detailed sections and perspectives of this main node will be discussed.

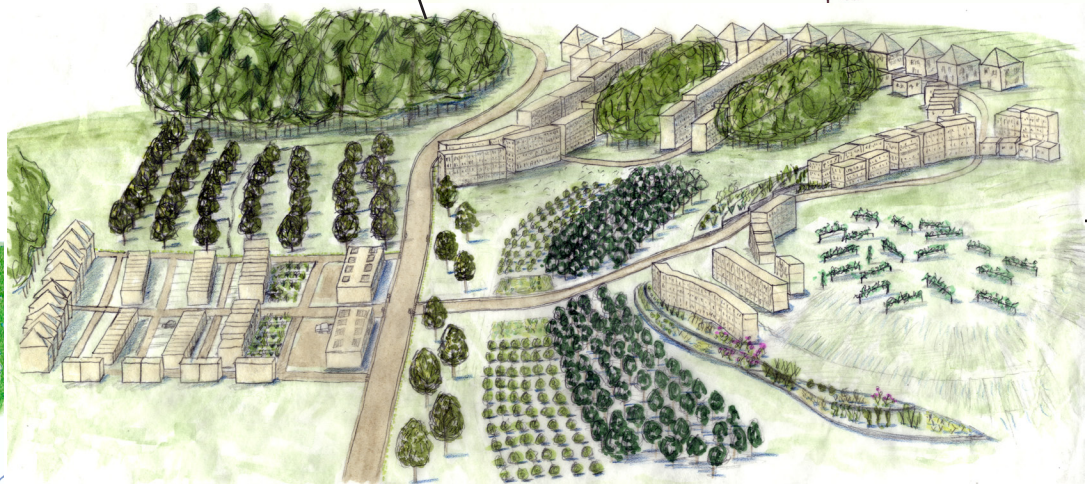


Figure 30

View looking east down a neighborhood street. The mixed dwelling types are distinguished, as well as the lot size difference. Cropping will occur between homes, but the cropping will be limited to herbaceous selections because of limited sunlight available.

Figure 31

Section illustrating grading away from street into pecan grove. This will include a bio swale area where storm water can be held before it reaches the grove. This will allow for natural drainage of storm water through out the community.

Figure 32

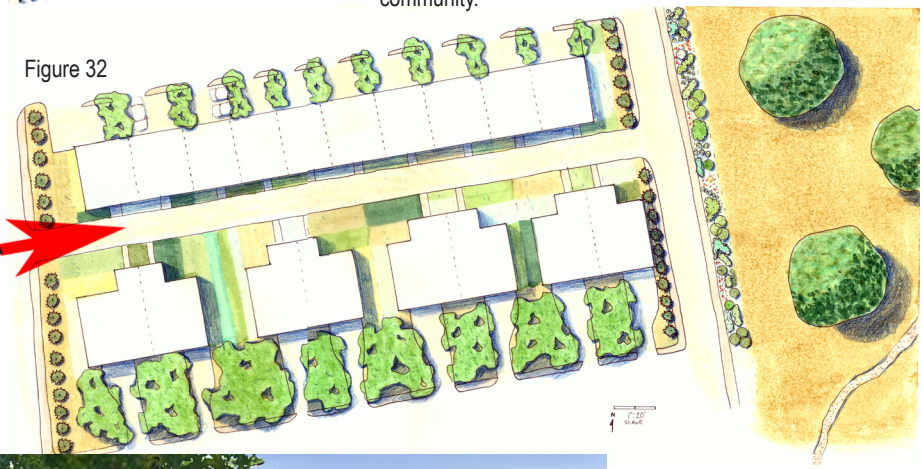


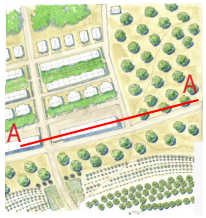
Figure 29

Aerial perspective of main commercial center and neighborhood. The close relationship between the residential, commercial, and productive elements of the site are illustrated clearly in this image.

Figure 33

Image shows proposed view looking out across the street from the commercial center. Signage is present on the site to notify people visiting that the production occurring is open for tasting, but those wishing to harvest quantities much purchase a bucket for picking. The pedestrian and farmer relationship becomes stronger because of the increased interaction through out the site. The members of the community and the farmer both want to succeed, therefore they will both put forth the efforts needed for that success.

Figure 34

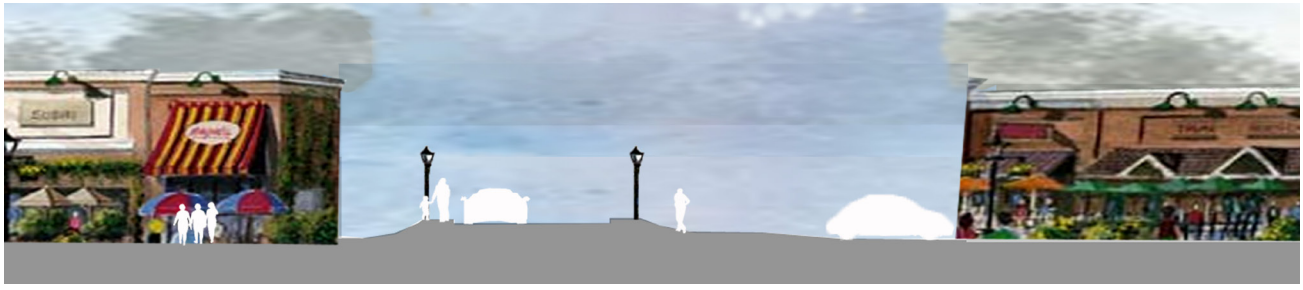


30’
Road & Bike
Lanes

Parking

Proposed
Scale 1”50’

N



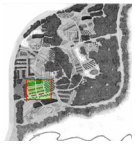
The main retail node allows opportunity for different types of shops to function in the community. This retail node can be the location for a coffee shop, restaurants, the market (year round farmers market and retailer for u-pick operation), pharmacy, and a gardening supply store. On two sides of this retail node agricultural production is the landscape vista that visitors will observe.

5’
Pedestrian Path
with solar lighting

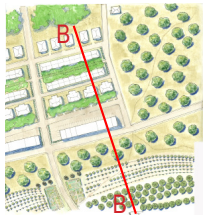
Pecan Grove

The spatial corridor of the pecan grove adds aesthetic function to this part of the landscape. The streets behind the retail center directly line up to create a vista looking out along the grove. This view of the grove is facing north, therefore it is looking at the grove and retail center as if standing directly across the street to the front of them both.

Figure 35



Existing
Looking East
Scale 1”: 200’
N



B

Vegetative Buffer

Secondary Road

Alley

Secondary Road

Figure 36

Looking east
Scale 1”:100’
N

B

Retail center with primary road

Blueberry cropping

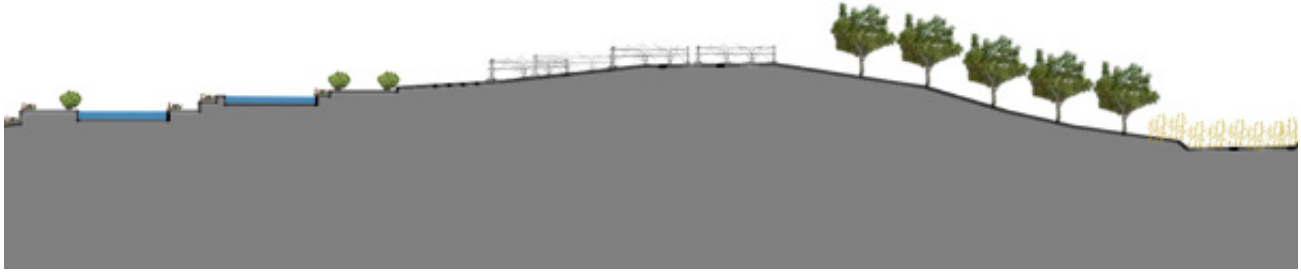
Fig orchard

As mentioned previously the spatial corridor of the streets continue into the pecan grove as illustrated in this section

Figure 37

Existing
Looking West
Scale 1": 200'
N

C



Terrace ponds and annuals

Muscadine rows

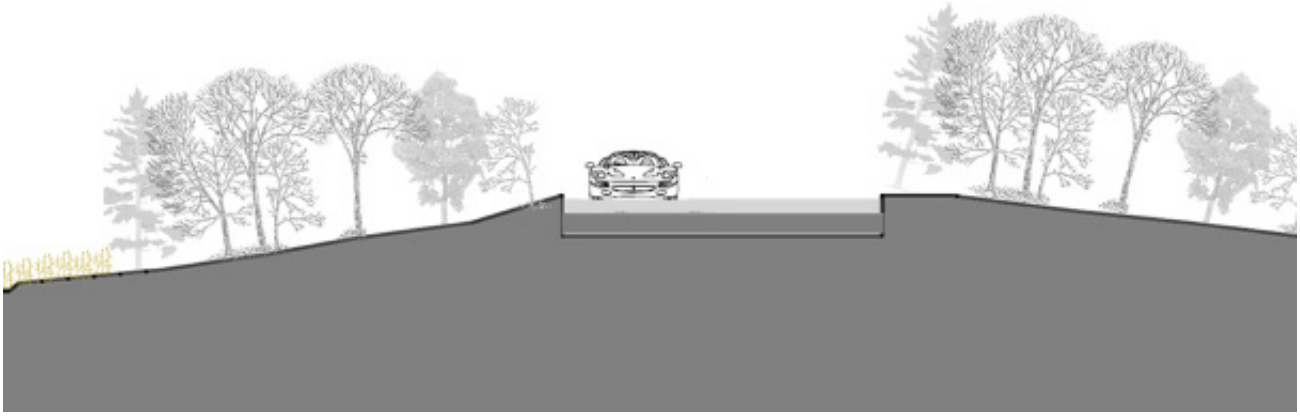
Fig Orchard

Grain Field

Figure 38

Proposed
View of terraces
Scale 1":100'
N

C



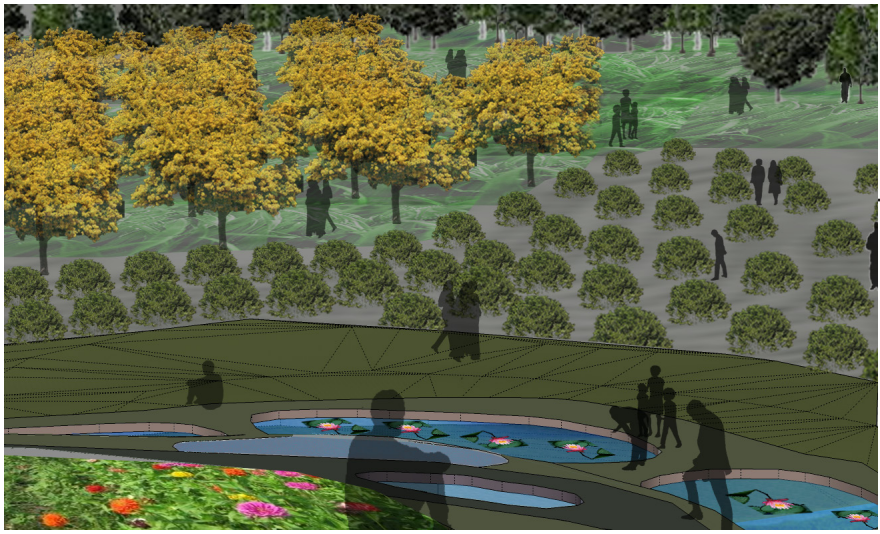
Grain Field

Vegetative Buffer

Mrs. James Road

Figure 39

The perspective illustrates a view looking towards the south of the site. Terraces will provide opportunity for seasonal harvesting. Some crops which could be harvested from the terrace ponds include seasonal fish, seasonal exotic plants including lotus and water chestnut. This would begin to open seasonal markets for luxury items without having to ship them from origin points worldwide.



Looking at a more detailed portion, this node shows some of the main qualities of the community. The location of the dwelling units is closer to the proposed outer loop to keep infrastructure contained. Five types of dwelling units are illustrated in this neighborhood, each type of unit has its own distinct lot space provided. The cropping patterns and the integrated dwelling units start to appear more evident. The placement of the cropping and the pattern they create are all directly associated with producing crops sustainably. For example, blueberry cropping is organized in a way which conforms to the contours of the land to reduce erosion. Community garden space is provided in various locations among the dwelling units to allow for daily interaction between residents and their annual plots. This neighborhood will also have a small commercial center which could accommodate a cafe and one or two small retail shops for daily needs of neighborhood residents.

Town homes

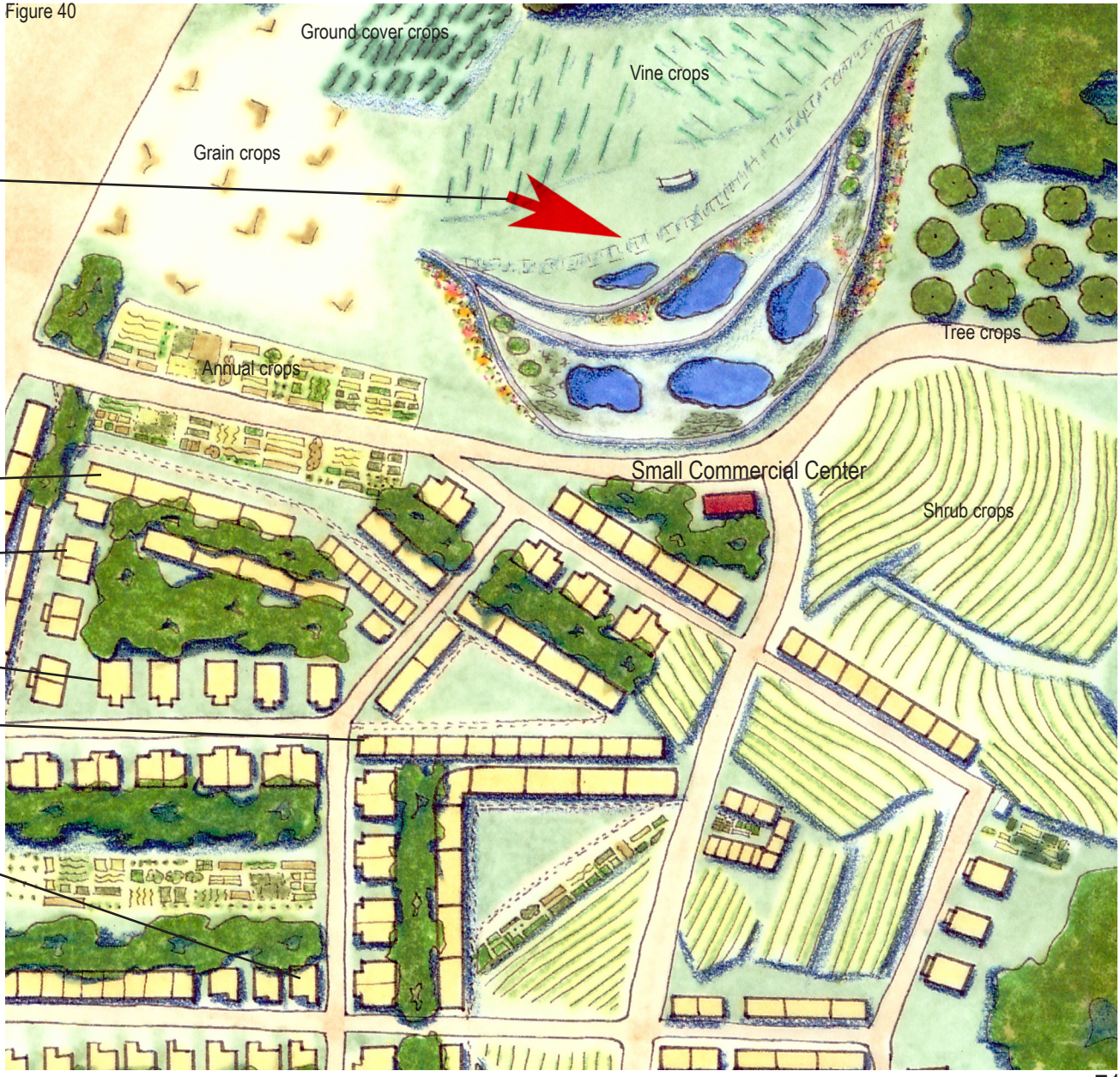
Duplex homes

Single family home (large)

Cottage homes

Single family home (small)

Figure 40


Ground cover crops
Vine crops
Grain crops
Tree crops
Annual crops
Small Commercial Center
Shrub crops

The third main node is illustrated in this image. The community center is located within this node in a central location to the production and residential areas. The community center anchors the northern part of the road which the farm center is also located on. The community center will offer amenities including a pool, tennis courts, basketball courts, and indoor recreational activities. It will also have a classroom to host local school children and others for educational tours of the community. Directly to the south of the community center is the live-work neighborhood which will be discussed later in the text. Also to the south of the center is the large gathering space for the community, which was designed in correlation with the community center. The grain fields located just south of the community center offer seasonal diversity. Grains can be planted during the winter months to hold and replenish the soil, and in the summer months other types of annual crops can be planted to supplement the designated annual cropping locations. This will allow for more acres to be put into annual vegetable production during the grain off season.

The neighborhood to the north of the community center contains all five types of dwelling units. The amenities of large cropping space, which the town homes and cottages have, is clearly shown in this image. This neighborhood could also offer some options for live-work units to be incorporated within the community.

Figure 41
Investigation into social opportunities within community areas of seasonal vegetable production

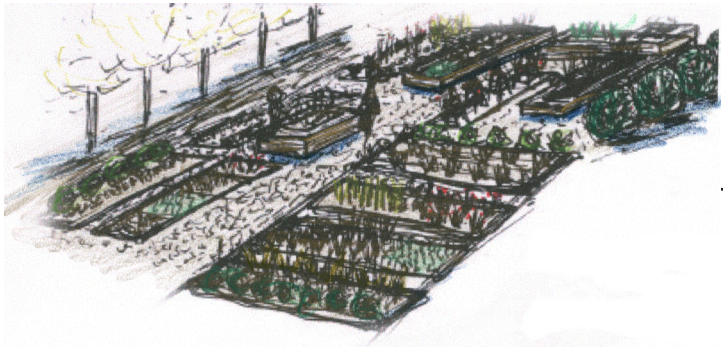


Figure 42


Cottages
Duplex
Pecan grove
Town homes
Single family homes
Blueberry crops
Strawberry crops
Muscadine crops
Community Center
Companion flowers
Annual vegetable plots
Grain field, changes annually

The farm center, live-work neighborhood and pond open space are shown in the illustration. The location of the farm center was designed based on proximity to the main production areas. Access to the farm center is maximized in this location, although pedestrian access is not encouraged by its placement. The farm is located so that transportation of harvested goods can be done quickly. The three main areas of production surround the farm to the north and west, while the two main areas of woodland production surround the farm to the south and east. The live-work dwelling units located just north of the farm center offer housing options for those wishing to reside in the community, but cannot afford to buy into the program. These dwelling units offer potential homes for farm workers or student workers who wish to live and work within the community. The location of these live-work dwellings is close to the main farm center and community center, with a large amount of open space amenities directly to the east; this location puts the workers central to all the production areas. Smaller single family dwelling units will be incorporated in this neighborhood as well to offer a diverse range of dwelling opportunities for residents.

Figure 43
Investigation into social interactions at the pond area

Figure 44

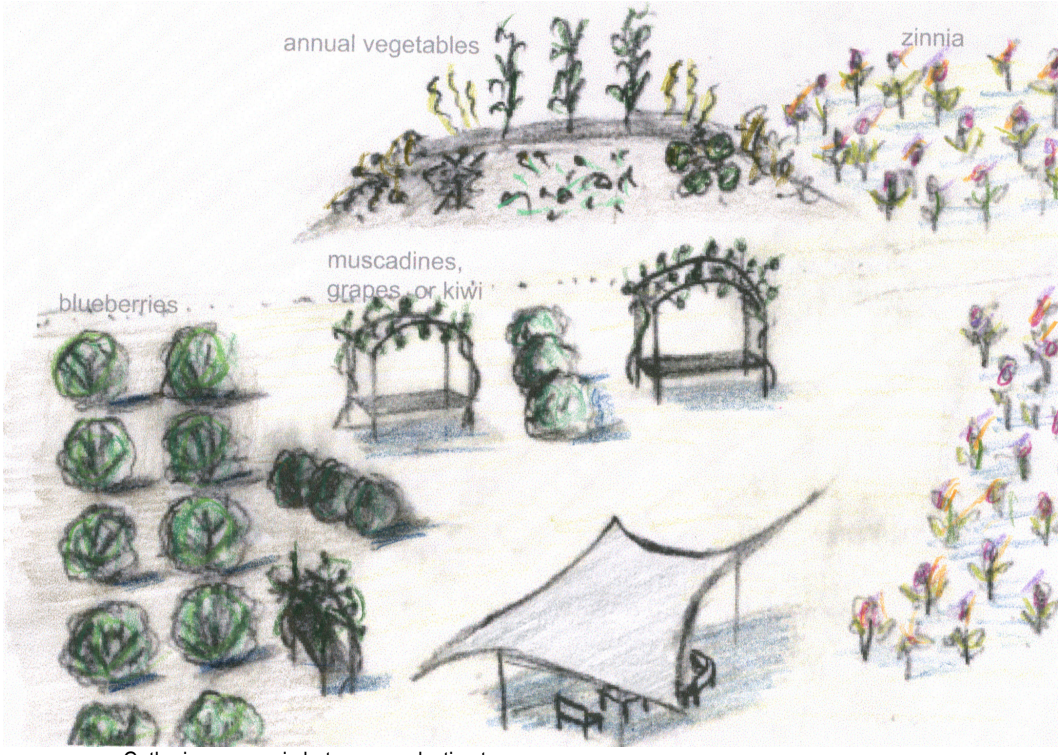

Pecan grove
Live-work residential neighborhood
Farm center
Woodland production

The illustration is showing the woodland area located in the northern part of the site. This area can be used for production as well, but the production which occurs here will be managed significantly less then the rest of the production on the site. Harvesting which can occur in the woodland would be seasonal honey production, as well as selective timber harvesting to assist with construction needs through out the community. The honey production can be brought in during the spring months when crops are flowering and need to be pollinated. This would allow for additional diversity of production which can occur within the community. The bee keeping for the honey production will be tucked away in the woods to prevent any pedestrians from accidentally stumbling across the pollinators nesting grounds. The use of temporary facilities and honey harvesting will be used initially for this production. If the community decides it would like to have permanent honey operations in tact, allowing bees to overwinter on site, then the community can plan for permanents honey production and take the necessary precautions.

The timber production from the woodland will allow for selective pruning of the forest, which will help keep the woodland healthy. Timber harvested can be used for on-site construction projects or sold for community revenue. The woodland areas can also supplement the production of the site by allowing for wild harvesting to occur. Many native plant selections found on the site can be harvested with no monetary input needed from the community. Some of these plants include wild muscadines, native pecans and hickories, sumac spice, wild raspberries, wild strawberries, and wild blueberries. The woodland is an area which has a lot of potential for production. It also provides areas of increased biodiversity which help to keep the agricultural production areas thriving.

Figure 45

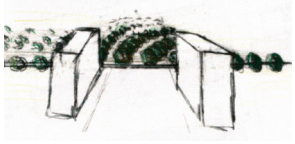
Figure 46

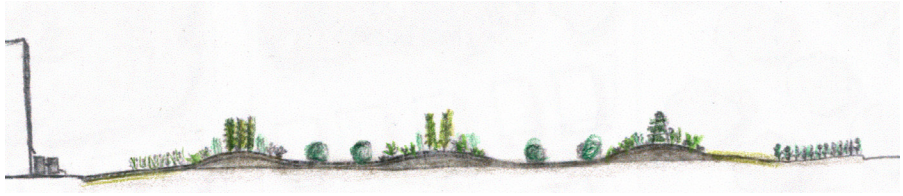


Gathering spaces in between production types

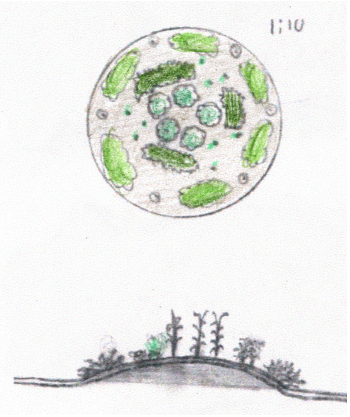
Proposed social areas with shade and water harvesting within the blueberry fields

View looking into blueberry fields from roadway between town homes

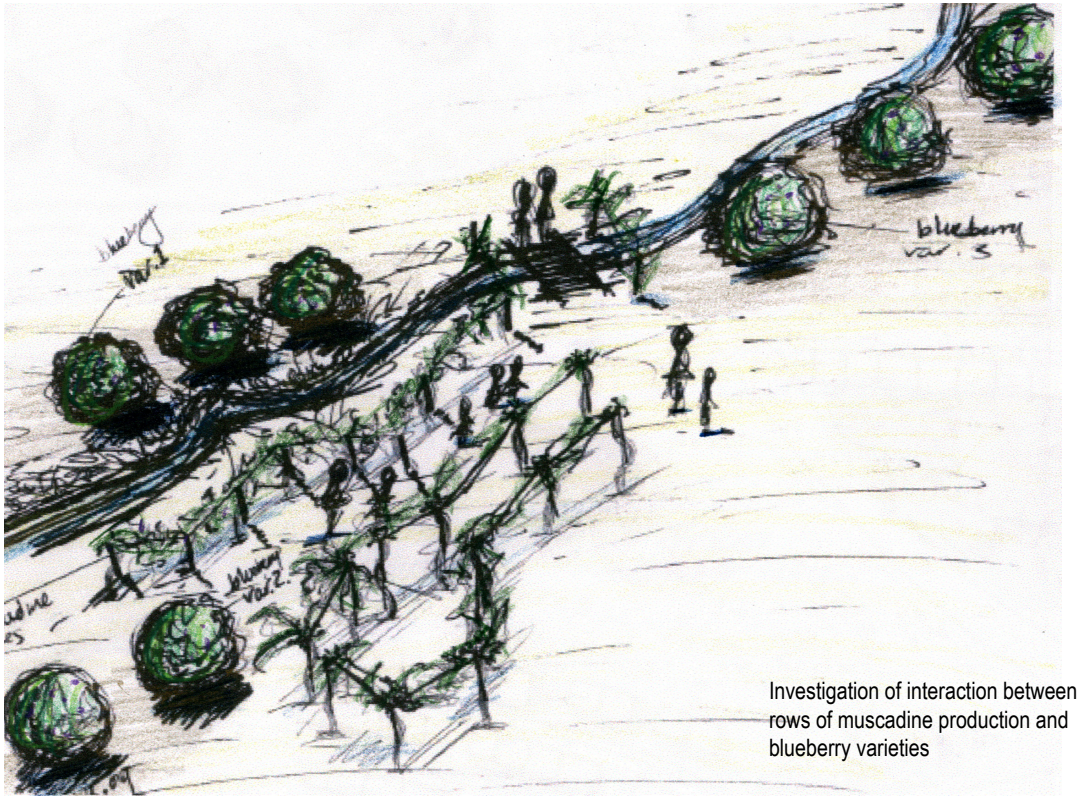




Section illustrating vegetable planting gardens within the blueberry fields to allow social interaction on a daily basis and seasonally through community planting events



Typical mound plantings will change seasonally as harvesting occurs



Investigation of interaction between rows of muscadine production and blueberry varieties

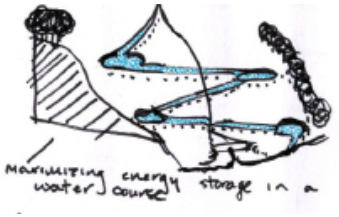


Figure 47

Permaculture technique to maximize energy storage in a water course. This principle can be applied along the descending slopes to capture water and supplement the water needs of the cropping.

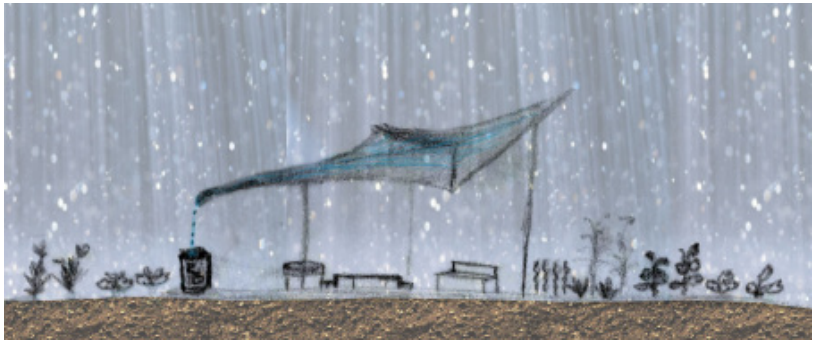


Figure 48

Rain barrels will be put in various places through out the site to harvest rain water in areas where the terrace water harvesting will not reach. These will be used in conjunction with shade structures in gathering places to provide the surface from which the water will be captured.

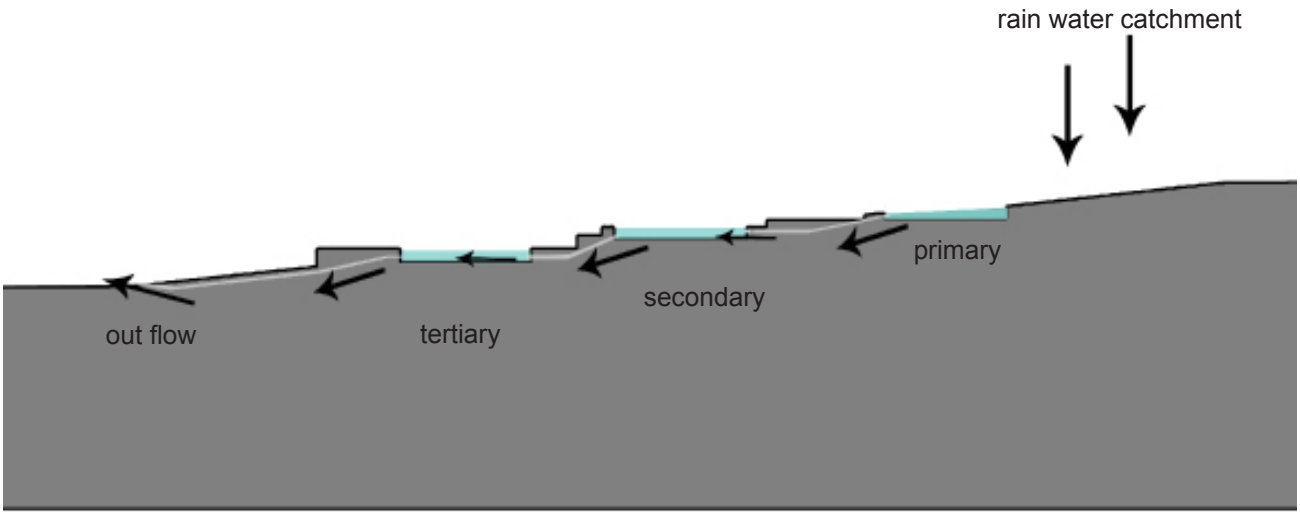


Figure 49

Gravity enabled watering system can be used to force water into areas where it can be re-used to irrigate the crops, this will only be a supplement to the water that will be needed for the production. Besides this method well water can hopefully be sourced to fulfill the needs of the cropping that will take place.

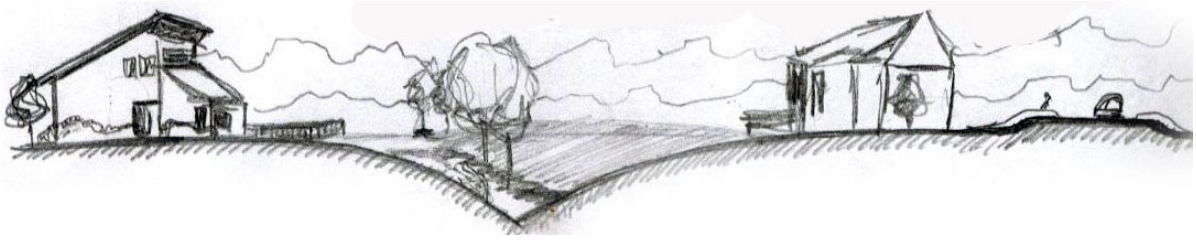


Figure 50 Drainage from roads will occur by grading lots away from the street to allow storm water to drain through swales in the backs of yards and common areas (Corbett).

“Food is at the foundation but its really about life.”
Will Allen

Chapter Six: Conclusion

In conclusion, the design thesis has shown that agriculture can be put first in an effort to make more sustainable development choices. The outcome is a designed community, which has the potential to thrive and strengthen as a community in future years. There are opportunities for generations of families to enjoy the benefits of producing. The initial investment will provide a stable foundation for families in the future, and not only will they own a home, but they will also own a piece of the production that now produces 7 times more than it did at the start of the investment phase.

However, some of the limitations that would be present in the proposal might put this type of project on hold for a while. One of the hardest parts of this type of development is overcoming the hurdle of who is going to develop the project initially. This is the person that controls exactly how the community will evolve, and if the developer is someone that is not willing to take the risks associated with farming, then the project would never be able to thrive. Overall the people of the community would have to participate as well, and this could be a challenge in organizing a number of able and willing people to actually make the community thrive as a whole. There will be the option for types of dwelling units to accommodate all types of income, but the number of people who participate in the sharecropping must be adequate to support the agricultural practices for the community.

Future research on the subject could explore these techniques further and should include trying to figure out the most beneficial way for anyone, who is part of the community in any way, to participate in the production occurring on site. Also, the opportunity to focus on trying to incorporate various scientific research fields into this type of development could be explored. This would be especially possible in a community such as the proposed one here in Auburn, AL, with huge support from its land-grant university neighbor.

From the beginning of civilization, man has harvested plants for his own benefit. Usually the main benefit was survival, as items were not readily available in a grocery store as they are today. As a species, humans have learned how to cultivate and manipulate plants to their personal liking, creating scenarios where plant production was put to its maximum potential (Pollan 2001). As the modern world changed and industrialization began to spread, plants were no less susceptible to the mass production that industrialization created. This is where all the current problems that are now being faced originally began. As more people started to have less time for their own cultivation practices, they began to depend on others to produce their food for them. This was not the only problem; there were not only fewer farmers still cultivating the land, but also more of the farmable land was being consumed by sprawling cities. Houses were being put on huge lots of previously farmed land, and no intentions were being considered for any type of farming to occur on those lots. What once was an acre of land which could sustain up to 8 people's fresh produce needs, now has become an acre of land most often containing a large single family home with about 4-5 residents, about two cars, and a highly demanding lawn. So not only is the land being taken over for shelter, but it now encourages its residents to drive most places and in no way reminds them of where their food originally came from (Pollan 2006).

It is hard to live a localized lifestyle in this day and age. Most of the time the most convenient, cheapest, or only choices are not locally produced ones. We have entered a time when globalization has spoiled us in all senses. There are many positive aspects of globalization that most people would say outweigh the negative aspects of globalization. That is why the negative aspects of globalization need to be looked at and addressed in a way that would benefit everyone as it benefits the earth itself. The problem is greater than the neighborhood scale of things, but I believe that if people can make small changes and go against our current industrialized mass food production technologies it would lessen

the burden. By burden, I am referring to transportation costs, massive amounts of chemicals being used in monotone crop cultures, water resource depletion, food safety, and human health issues. People would have to begin to rely on themselves or the notion of supporting a local farmer (community-supported agriculture), and they would realize exactly what it takes to acquire quality food products (Pollan 2006).

What is needed is community-integrated agriculture. Creating neighborhoods, which can contribute back to the ecosystem through production, should be considered, especially if new developments are going to continue to engulf the peri-urban agricultural areas outside of the urban centers of towns. New communities should be developed in a way that allows the people of these communities to have the opportunity to supplement their own food sources through local production. This would promote increased participation within the community. People who are living in urban areas usually do not have the opportunity to cultivate their own produce. Often, they convert vacant land into their gardening space, only to lose that space when something develops in the vacant spot. Imagine a community, which allows different income levels to reside together, and provides a permanent place for production to be a part of the landscape and community.

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Appendix

Nodes

Orchard Crops

Tree Cover

Tree Crops

Blueberry crops

Vine & Annual Crops

Grain Crops

Residential

Figure 51

Dwelling Placement Investigation

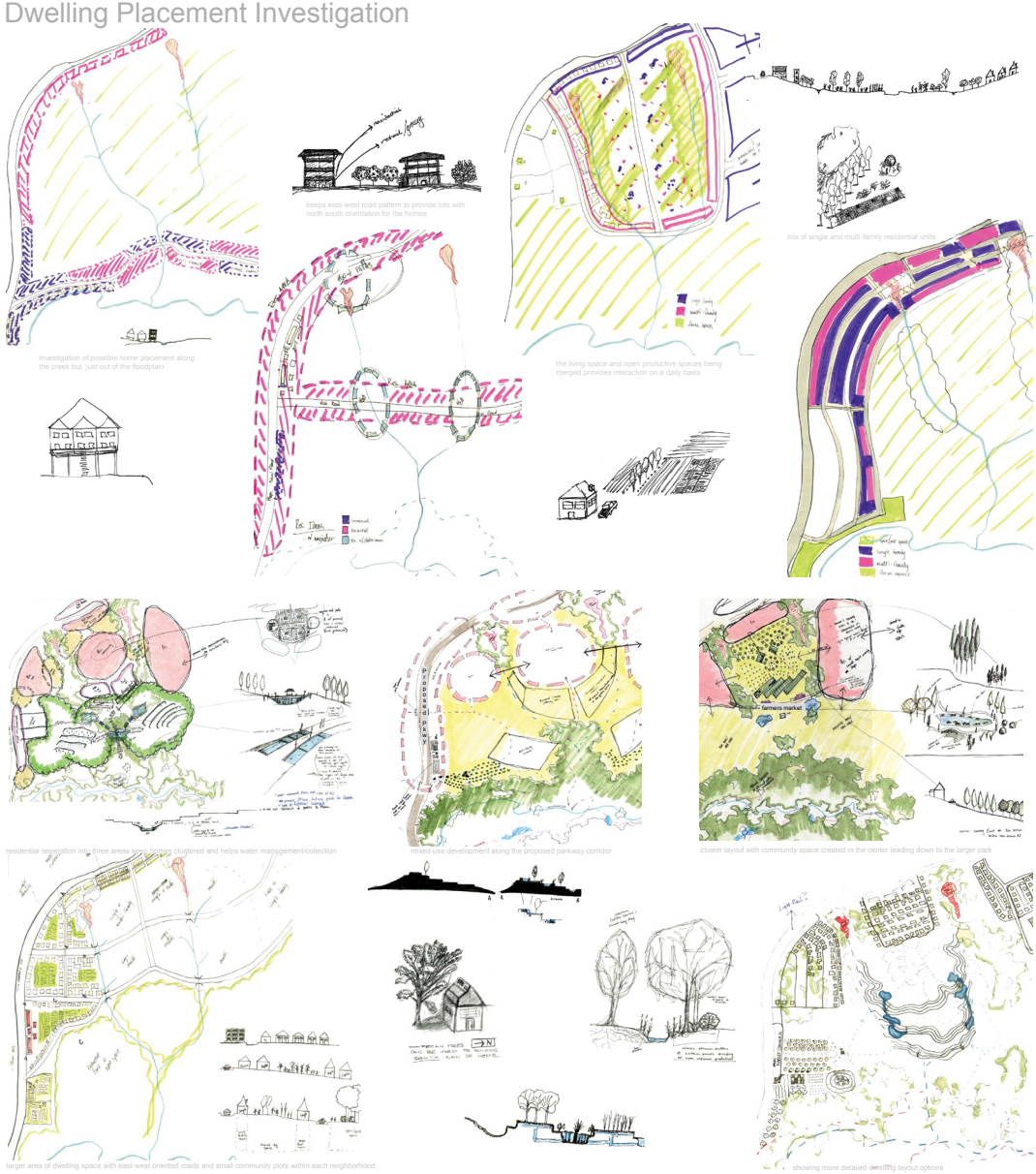


Figure 52

Water Placement Investigation

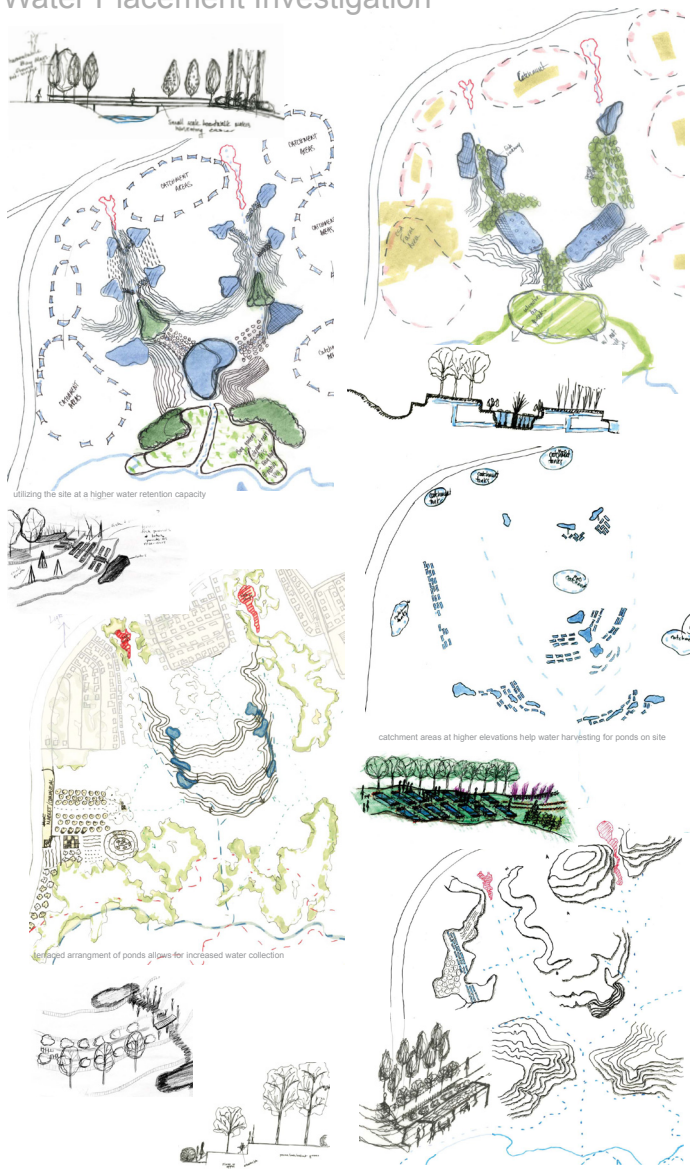


Figure 53

Figure 54

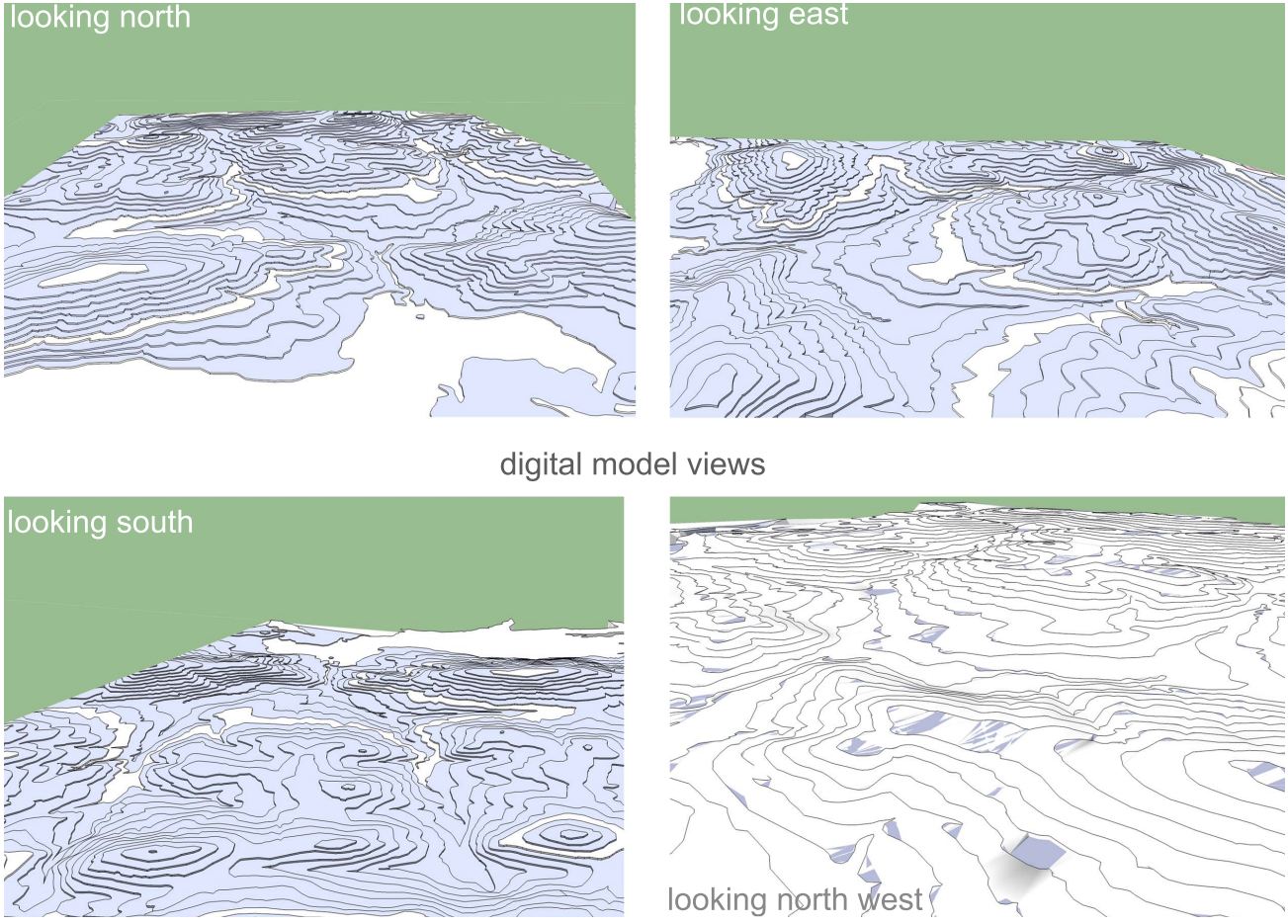

looking north
looking east
digital model views
looking south
looking north west

Figure 55

Serenbe Community - Palmetto, Georgia

-Started in 1996
-Over 70% of the land is preserved as green space.
-Permeable roads are used in the entire community, but one downfall of this is that the roads seem to be eroding rapidly in certain areas.
-Production is not clearly visible in the main gathering areas. They are using native vegetation and organic techniques in yards of homes but Not edible natives.
-The architecture is very modern looking and houses vary from estate lots, town homes, live-work homes, farm sites.
-Three restaurants in the community serve mostly locally grown food.
-900 Total Acres
-110 Housing Units with more under construction
-25 Acres in organic production

downtown

scale: 1″: 100′
source: www.serenbe.com

typical single family dwelling

multi-family dwelling

permeable storm drainage and roads

Figure 56

Village Homes - Davis,

-Started in 1974
-Overall residential density is four units per acres, which maintains rural feel
-All the drainage on the site is designed so that it is naturally drained
-Fruit is kept organic by spraying with lime sulphur
-Honor system technique is used for harvesting, families are encouraged to take what their family can/will consume
-All streets run east-west and all lots are oriented north-south for full solar aspect
-Household common areas consists of land between homes along the paths which residents must come together to maintain.
-70 Total Acres
-225 Homes
-23 Acres green space (orchards, vineyards, green belts, common areas, parks)

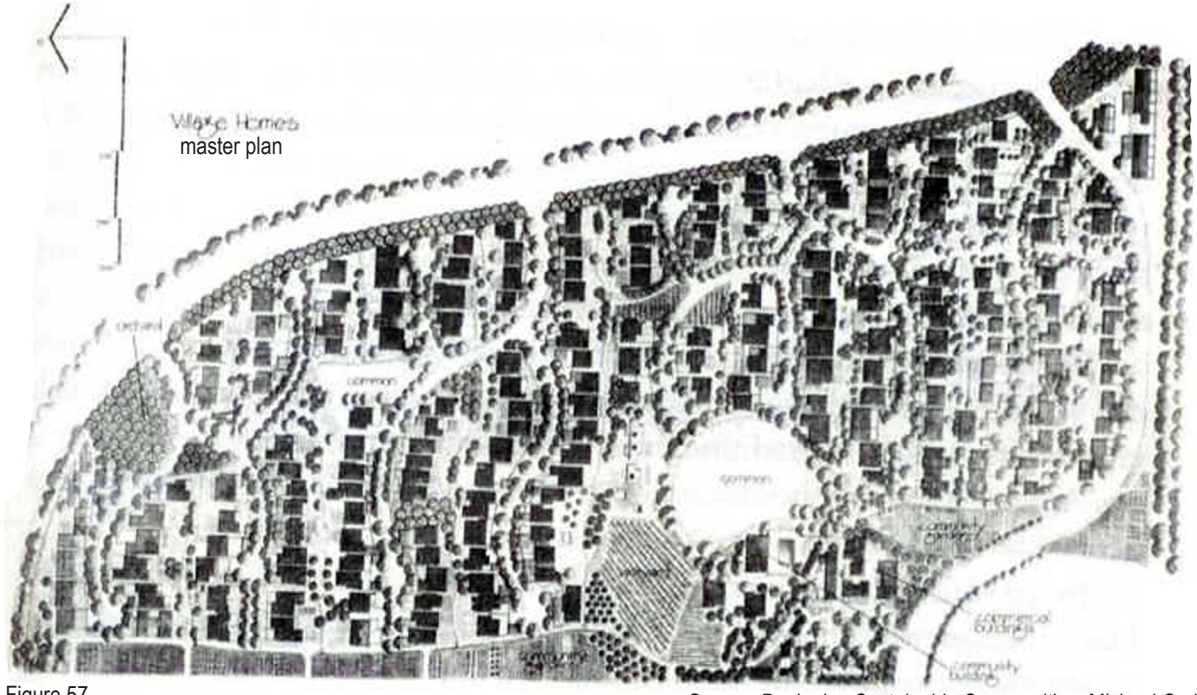


Figure 57

Source: Designing Sustainable Communities, Michael Corbett

-Can not plant trees within 75' of levee because roots will penetrate the wall and cause leakage in the ponds. Small shrubs and herbs are fine to use on levee.
-Ponds prefer to be in full sun
-25 acres of land collects run-off for a 1 acre pond. This ratio is reduced by terracing or stacking ponds.
-Catfish are the most tolerant fish for year round production. Grass carp are used in ponds to control vegetation and are consumed largely by the Asian population.
-Seasonally perch, blue gill, and tilapia are producible in Auburn, AL.
-Ponds are drained for harvest. They can be refilled in 24-36 hours.
-Ponds set up on a slight slope to allow gravity to force water through the ponds, all water in the ponds are harvested from rainwater.

view of trial research ponds

pond after harvesting

greenhouses utilizing water from fish ponds

example of pond layering, view showing slope towards upper pond

University recreational and research ponds

Figure 58

“Agriculture and modern culture must merge for the greater good of all people.”

J. Hanes

Figure 59 Graphic exploration of dwellings placed directly into a blueberry field. The linear patterns draw through in both the housing and the blueberry cropping.

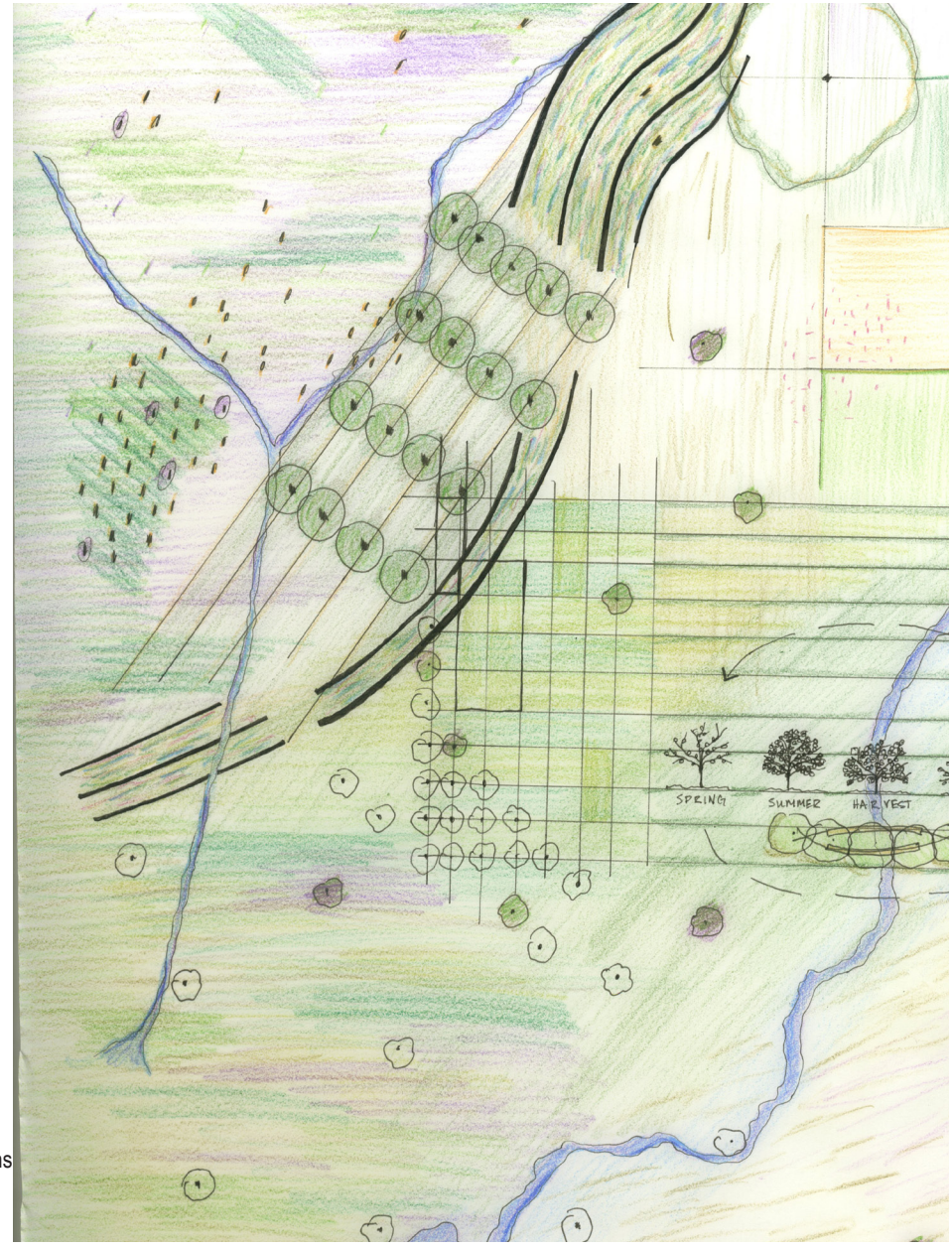
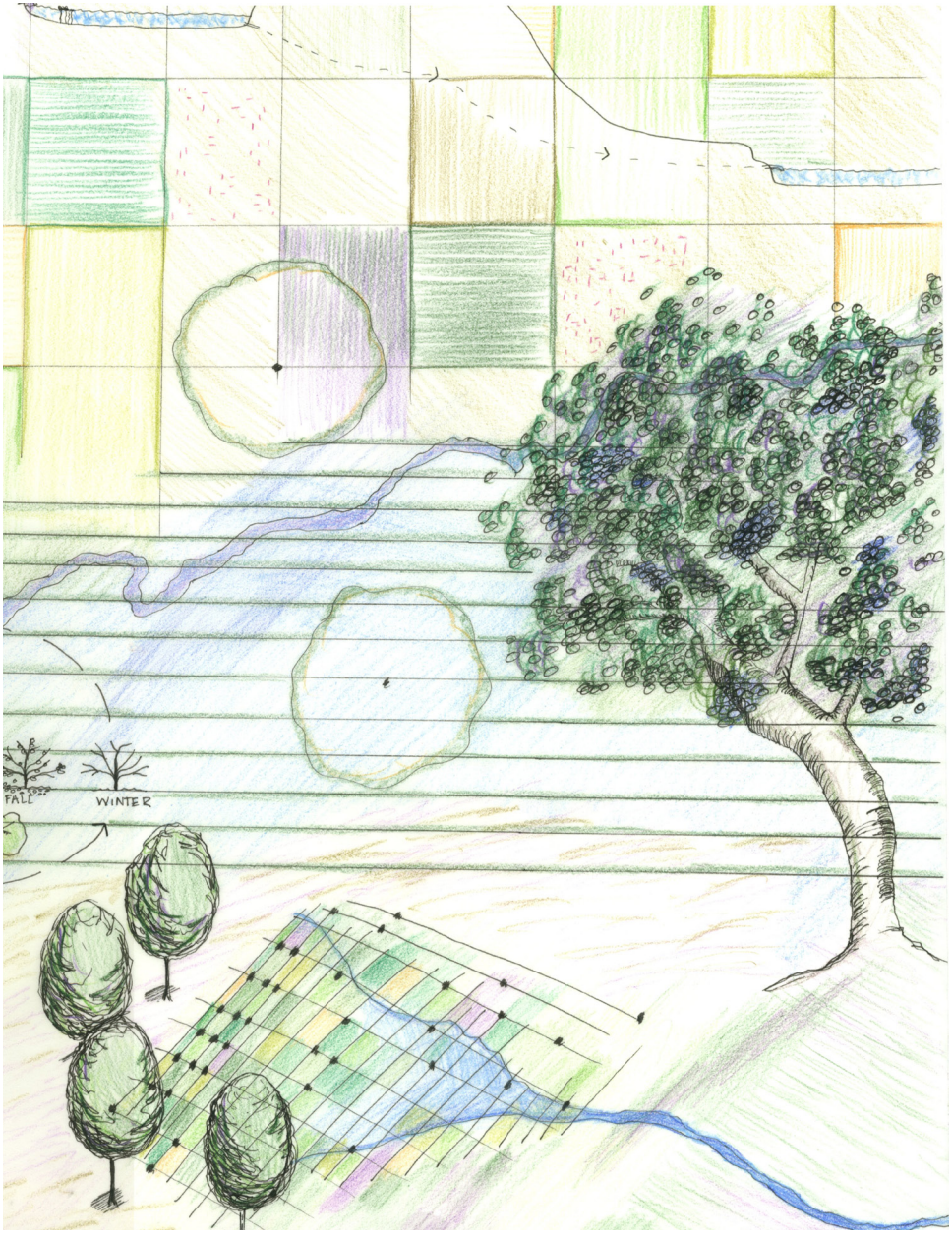


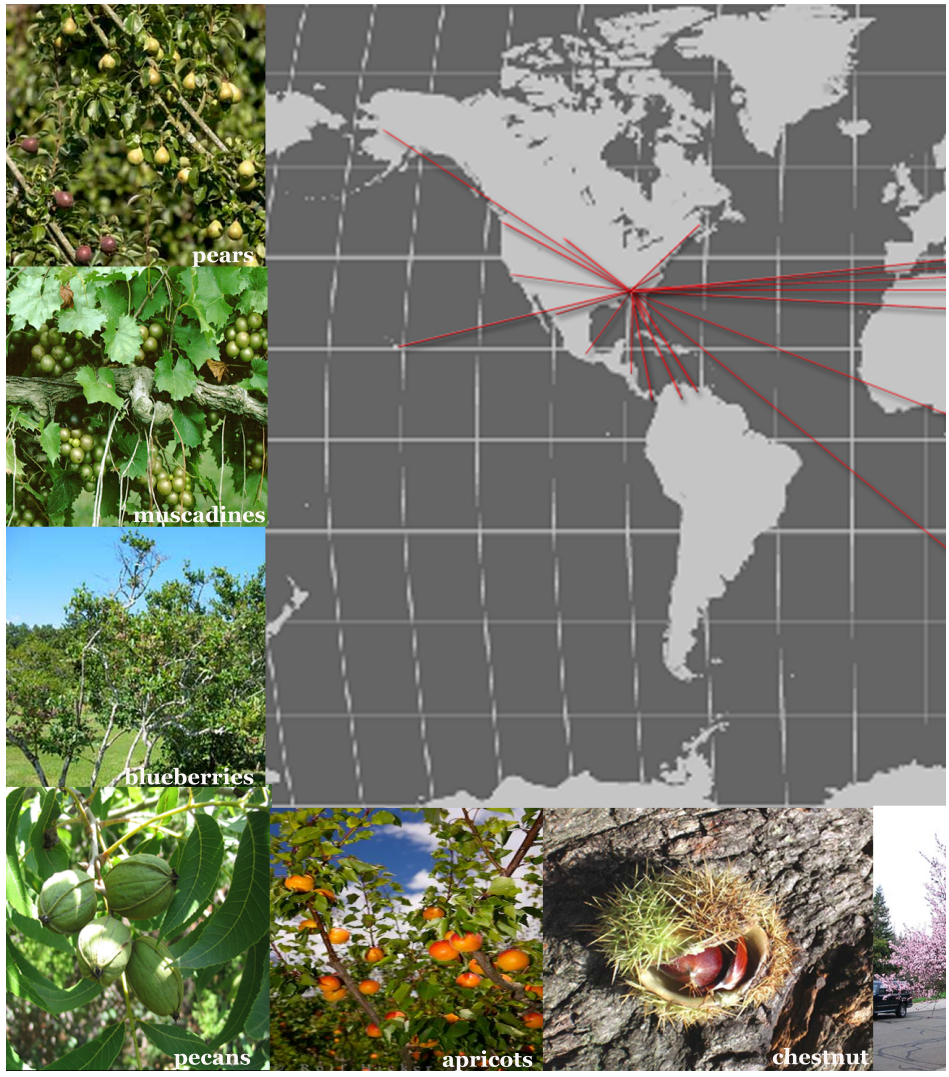
Figure 60
Graphic exploration of production patterns
Medium: Colored Pencil on Vellum


FALL
WINTER

Auburn Foodshed and Area Plant Selection

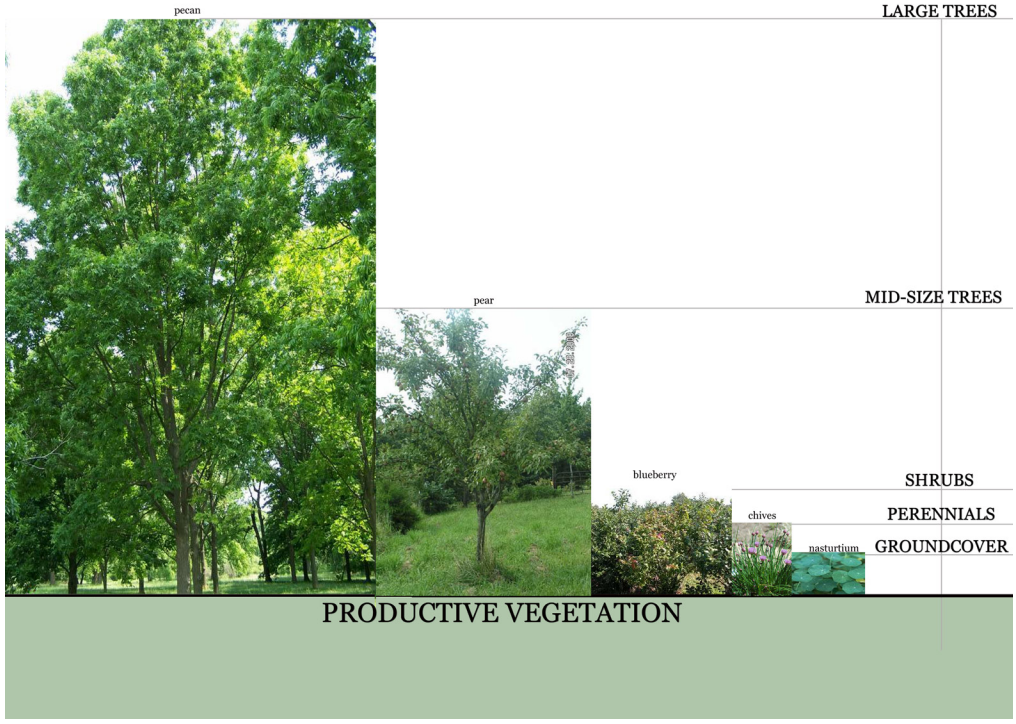
Figure 61
This Auburn food shed map was created by visiting local groceries and identifying produce origins. As the illustration shows, the produce found locally must travel great distances to reach Auburn citizens.

The alternative is a selection of plants that thrive in this area, along with a number of other seasonal crops that can be grown in the region.




grapes
figs
strawberries
plum
crabapple
blackberries

Spatial Potential of Urban vs. Productive Vegetation



The vegetative forms usually found in urban landscapes are shown to the right. The spatial potential to replace these typical forms with species that can provide more than just aesthetic function is represented to the left.

Figure 62
A comparison between the spatial form of typical urban trees versus productive trees. The same spatial form can be achieved with the productive trees to allow for aesthetic qualities, and consumable qualities.

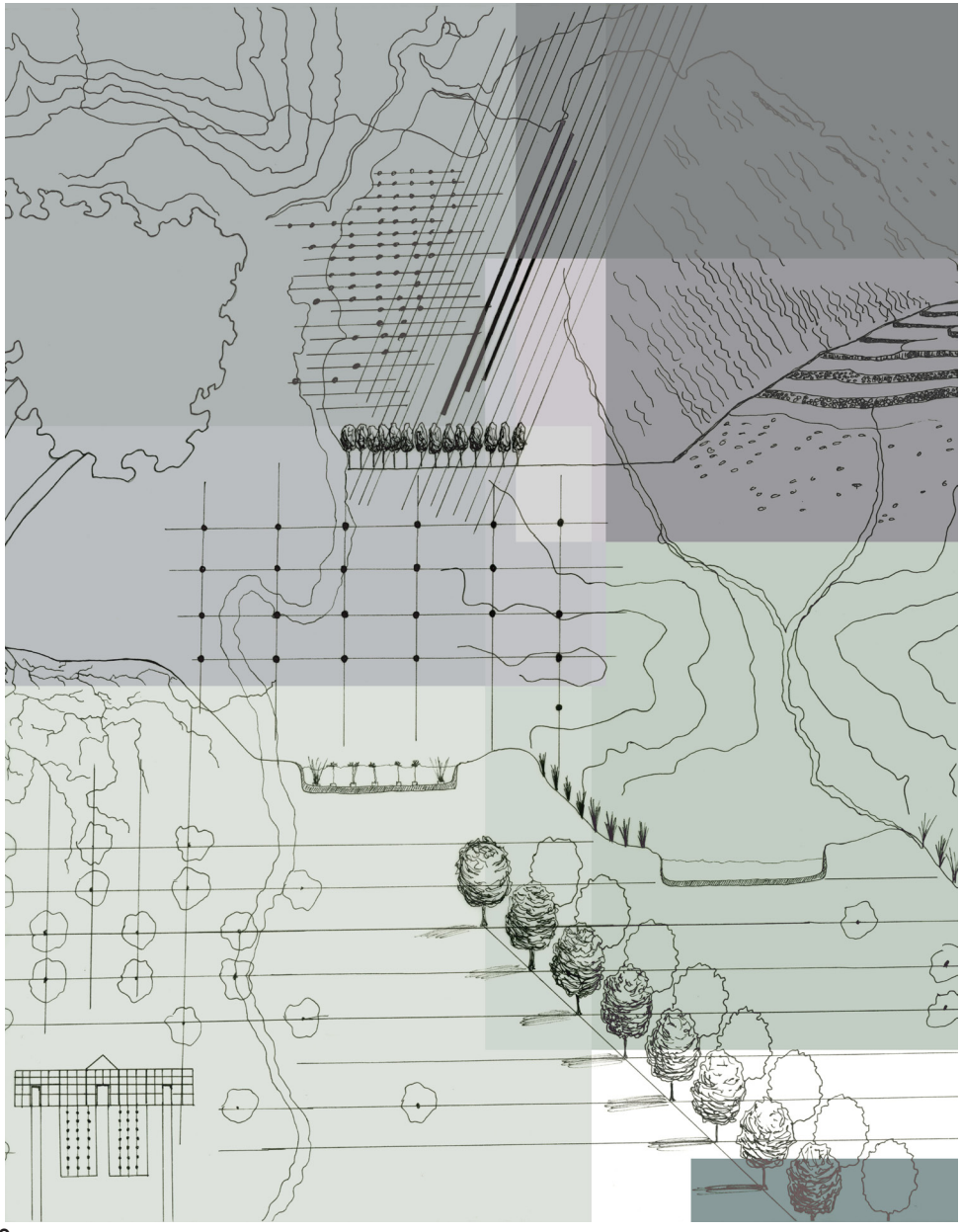


Figure 63

Graphic exploration into productive elements within the landscape. Medium: Pen on Vellum, rendered in photoshop

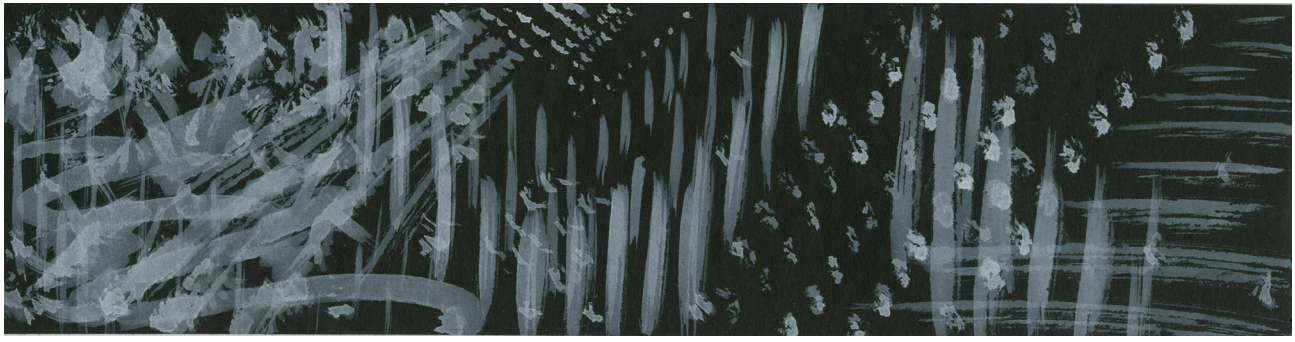
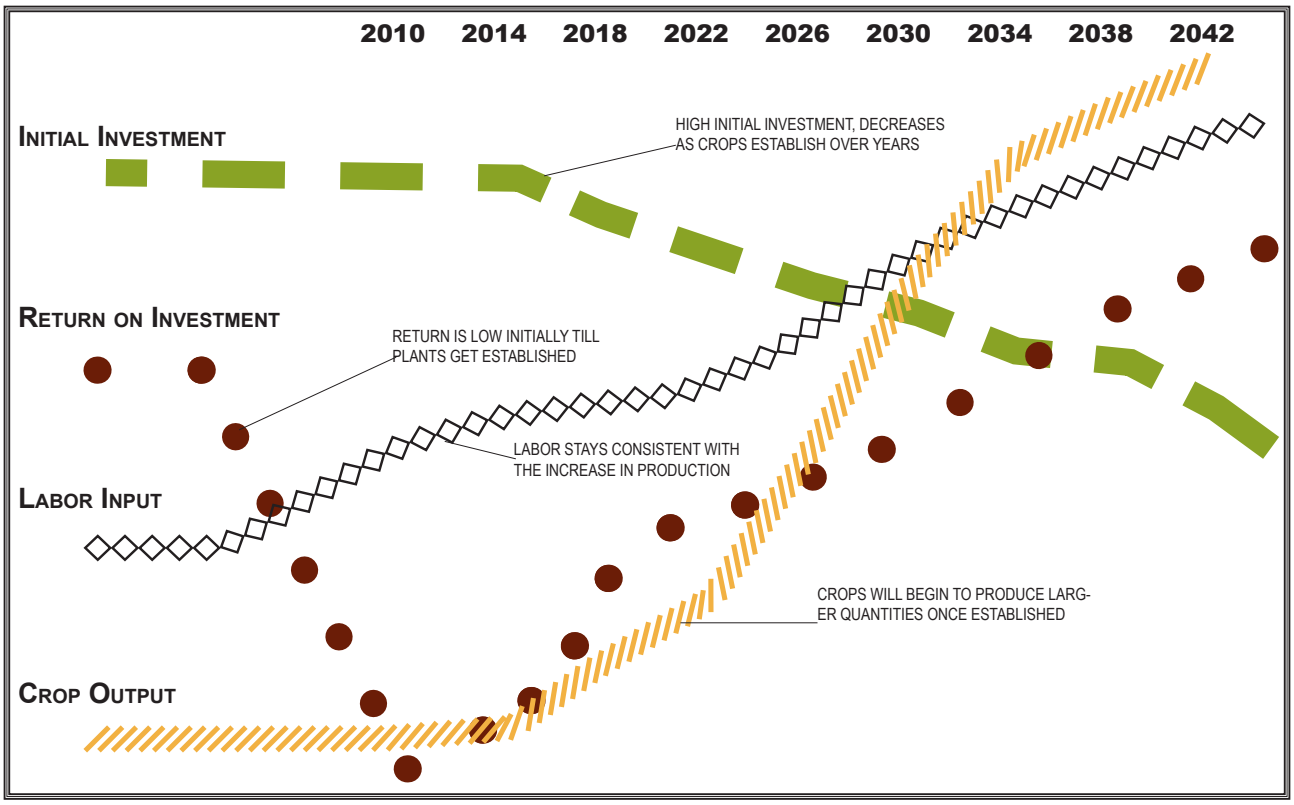
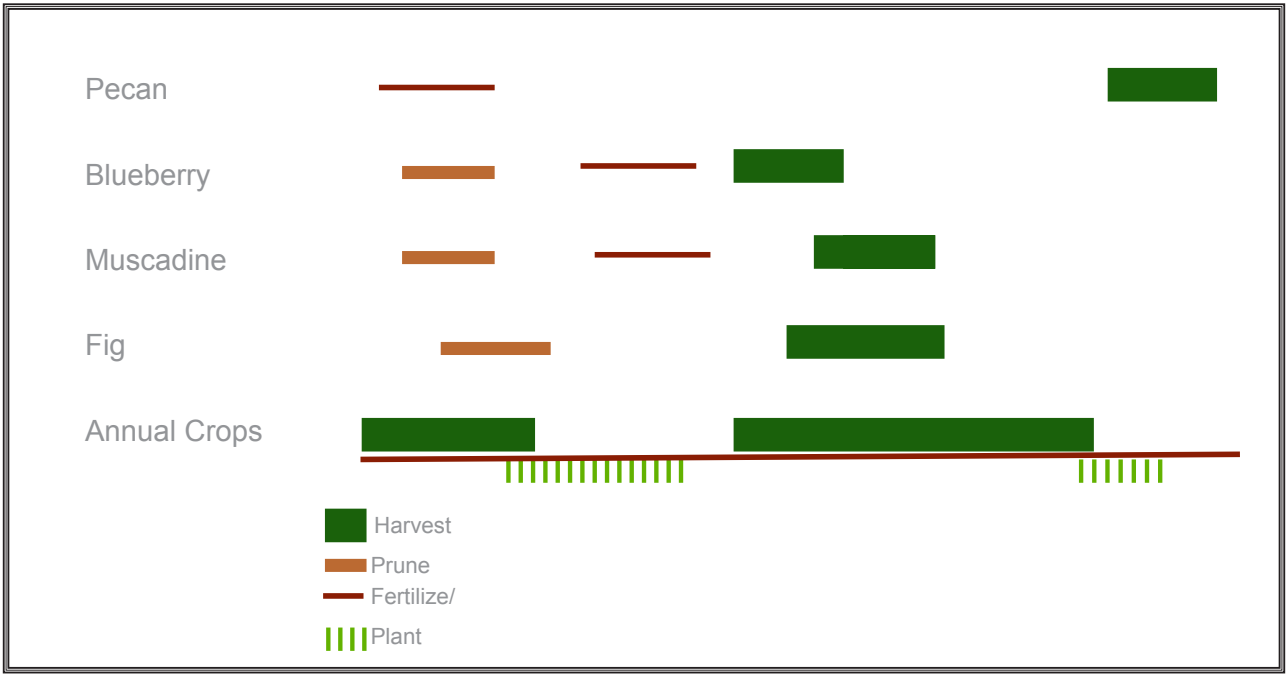


Figure 65 Graphic exploration of production patterns and spatial corridors. Medium: India ink on foam core

Figure 66 Graphic exploration of social interaction between dwelling units and agriculture.
Medium: India ink on foam core



The economic model shows the decrease in initial input from investors, as crop output increases. As crop output increases the return to investors will also increase. As mentioned previously this will allow for long term real estate values to increase as the agricultural aspect of the community becomes established.



Seasonal production requirements are illustrated in the graph. The annual crops require the most overall care for production, but also provide year round return. As mentioned previously, the annual cropping will either be maintained individually by homeowners or maintained as a whole by the community farmers. This is dependent on the homeowner and their choice of buying into the complete maintenance package.

(cost does not include equipment overhead)

Blueberries (~25 Acres)

First four years of input costs with no return equals approximately $17,707 divided by 1625 units = $10.89 per unit/ per acre

$10.89 x ~25 acres = ***$272.25 per unit***

Figs (~9 Acres)

First three years of input costs with no return equals approximately $8,488 divided by 1625 units = $5.22 per unit/ per acre

$5.22 x ~9 acres = ***$46.98 per unit***

Muscadines (~5 Acres)

First three years of input costs with no return equals approximately $13,637 divided by 1625 units = $8.40 per unit/ per acre

$8.40 x ~5 acres = ***$41.96 per unit***

Source: Lee County Extension Agency. Numbers based on last years production

(per one acre of blueberries)

Year	Cost	Labor Hours	Yield
1	$9,680.50	82	0
2	$1852.98	25	0
3	$3071.50	28	0 mulch
4	$3104.81	90	1,800 lbs. mulch, prune, mow, irrigate, fertilize, harvest, scout
5	$5,863.59	219	4,800 lbs
6	$5,15.62	282	6,600 lbs.
7	$6,068.72	330	7,800 lbs.

Source: Lee County Extension Agency. Numbers based on last years production