RESTRUCTURING THE MEANS OF CENTURY FARMS IN NORTH CAROLINA: A MUTUALISTIC OPPORTUNITY FOR LANDSCAPE ARCHITECTS & FARMERS

by

PEYTON DANIEL PETERSON

(Under the Direction of Brad Davis)

ABSTRACT

Over the past century the rural landscape has had an aging ownership and across the United States, and particularly in North Carolina, small family farms are ceasing to exist. More recently, however, various reformatory movements are garnering a new social conscience and youthful involvement for the agricultural community. This paper credits agritourism as a major contributor to this reform and specifically examines how the landscape architecture profession can establish itself as a valuable resource when rebranding a farm’s business model via agritourism. Research methods include secondary description that highlight landscape architecture and agriculture nexuses, a review of successful precedent studies that have made agritourism transitions, and a design application that graphically depicts the restructuring of a N.C. Century Farm’s business model to that of an agritourism niche. This thesis should serve as a prototype for landscape architects who are working with century farms or for small family farmers who are transitioning to a business model that includes agritourism.

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PEYTON DANIEL PETERSON
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PEYTON DANIEL PETERSON

Major Professor: Brad Davis
Committee: Georgia Harrison Hall
           David Nichols
           Benjamin Campbell

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
August 2017
DEDICATION

First and foremost, this thesis is dedicated to all of my family and friends (particularly my mother and father) whose continuous love and insight propels me in all walks of life. I would also like to dedicate this body of work to all those families who have passed small-scale farming legacies on from one generation to the next. Thanks to your efforts, maintaining a culture of stewardship with our rural landscape endures for the children of tomorrow.
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“My grandfather used to say that once in your life you need a doctor, a lawyer, a policeman, and a preacher, but every day, three times a day, you need a farmer.” (Schoepp, 2012). This poignant quote from Brenda Schoepp speaks to two fundamental truths of the human experience: firstly, that all people must eat – and secondly, that for the last century or so, most of them have relied on farmers to put food on their tables. Unfortunately, today many of these farmers find themselves struggling to keep their farms afloat, caught in the crosshairs of an evolving agriculture industry.

American agriculture and rural life underwent a tremendous transformation in the 20th century. Early 20th century agriculture was labor intensive, and it took place on a large number of small, diversified farms in rural areas where more than half of the U.S. population lived. These farms employed close to half of the U.S. workforce, along with 22 million work animals, and produced an average of five different commodities. The agricultural sector of the 21st century, on the other hand, is concentrated on a small number of large, specialized farms in rural areas where less than a fourth of the U.S. population lives. These highly productive and mechanized farms employ a tiny share of U.S. workers and use 5 million tractors in place of the horses and mules of earlier days. (Dimitri, Effland, and Conklin, 2005)
In his book *Family Farming: A New Economic Vision*, Marty Strange writes, “the family farm is an institution eroding from within, struggling somewhere between decline and death to hang on to the things it stands for. A long-term transformation is underway in American agriculture from small-scale, broad-based farming to large-scale, industrial farming” (Strange, 1988).

Unfortunately, this means that many small family farmers whose operations once afforded them a decent standard of life now find themselves unable to compete with their larger factory counterparts. At the same time, young American farmers are growing increasingly scarce. Spurred by job opportunities in urban areas, many have shunned farming as an occupation altogether, leading to a rise in the average age of Americans tending to the rural landscape. Rich Allen and Ginger Harris summarize the trend in *What We Know About the Demographics of U.S. Farm Operators*:

The average age of all U.S. principal farm operators in the 2002 Census was 55.3 years of age. This average has been more than 50 years of age since at least the 1974 Census of Agriculture and has increased in each census since 1978—usually by one year or more from one census to the next…. In addition, the percentage of principal farm operators 65 or older has risen consistently since 1978 (when it was about 1 in 6) and reached 26.2 percent (more than 1 in 4) in 2002. At the other end of the spectrum, the percentage of principal operators with average ages of less than 35 years has been declining since 1982, when it was 15.9 percent, and was only 5.8 percent in 2002. (Allen and Harris, 2005)
Just as the farming industry has changed over time, though, consumer tastes today are evolving as well. Many Americans are becoming increasingly conscientious about what they put in their bodies and placing a higher value on how their food is grown. According to the USDA, “consumers have also recently demanded attention to environmental issues in agriculture. Growing interest in environmentally friendly production practices has expanded markets for organic and other specialized products and has influenced the direction of environmental policy for agriculture.” (Dimitri, Effland, and Conklin, 2005). This increasing consumer demand for organic and locally grown foods has also been evidenced by rapid recent growth in the popularity of farmers’ markets and “health food” grocery stores.

For small family farmers who have felt pinched by the agriculture industry’s shift towards large-scale industrialized farming, these market developments present a alternative, yet promising opportunity. If these farmers are willing to tweak their business models slightly to accommodate for changing consumer demands, they stand a very real chance of their operations being able to thrive once again.
Research Objectives

How can landscape architects use design to increase the fiscal viability of small family farms in tandem with the changing agriculture industry? Secondarily, how can environmentally and place sensitive site design help leverage farm assets as part of agritourism and increase profitability?

The thesis will serve to define opportunities which the landscape architecture and small-scale farming professions share, and to prescribe ways that landscape architects can help small farmers plan, design, and incorporate new and innovative practices into their existing business models. Specifically, it will explore the adoption of agritourism business practices by North Carolina Century Farms – most of which are small farms with rich histories and deep ties to their communities. In its examination of this topic, the thesis will also answer:

• How has the farming industry changed over the last century?
• Why is agritourism important in today’s farming economy?
• What is the accepted definition of agritourism?
• How is the market for agritourism changing in North Carolina?
• What agritourism activities are the highest grossing?
• What are the top reasons for visiting an agritourism farm?
• What factors should be considered before entering into an agritourism venture?
• What are the opportunities and constraints of a joint venture between a landscape architect and a farm owner?
• What is a North Carolina Century Farm, and why is it important?
Methodology & Thesis Structure

In researching and composing this thesis, a variety of methods and research strategies will be employed – the terms for which come from Deming and Swaffield’s *Landscape Architecture Research: Inquiry, Strategy, Design*. First, a number of literary sources pertaining to such topics as farming, the history of farming, North Carolina farming specifically, North Carolina Century Farms, and agritourism will be reviewed and the findings summarized using secondary description in Chapters 2 and 3. In Chapter 4, precedent studies will be conducted to gain an understanding of how some small North Carolina farms have successfully incorporated agritourism practices into their operations. For each farm operation, site data and photos will be compiled and interviews with their operators conducted. The operations will then be compared, contrasted, and generally evaluated to garner a better understanding of what typically works in a real-world agritourism application and what does not.

In Chapter 5, a North Carolina Century Farm (Twiddle Dee Farm) currently in transition to embrace a business model of agritourism, will be examined. Observation procedures will be carried out to investigate site context and identify design opportunities and constraints, and then a “projected design” strategy will be employed to envisage how the collective takeaways from all the above descriptive research methods can be applied to the farm. An appropriate agritourism business model will be developed and accompanying designs rendered. Finally, in the concluding Chapter 6, the findings of all the research and design efforts put forth in the first five chapters will be summarized. (Deming & Swaffield, 2011).
Research Question
(Chapter 1)

How can landscape architects use design to increase the fiscal viability of small family farms in tandem with the changing agriculture industry?

How can environmentally and place sensitive site design help leverage farm assets as part of agritourism and increase profitability?

Descriptive Research Strategies
(Chapter 2-5)

Secondary Description
(Chapters 2, 3)

Precedent Studies
(Chapter 4)

Observation
(Chapter 5)

Family Farm History, Agritourism, N.C. Century Farms

Examples of small, family farms that have successfully transitioned from traditional farming practices to that of an agritourism operation

Site context Design opportunities Design constraints

Projective Design
(Chapter 5)

Apply research findings to design recommendations for Twiddle Dee Farm, Clinton, NC.

Twiddle Dee Farm is a N.C. Century Farm restructuring their business practices from traditional agriculture to that of agritourism initiatives.

Figure 1: Methodology Flow Chart (Adopted from Deming & Swaffield, 2011)
Limitations and Delimitations

This thesis does not purport to define the best or most appropriate solution for every North Carolina Century Farmer looking to restructure their farm’s business practices. It does not assume that all North Carolina Century Farms are small-scale operations, nor does it assert that all Century Farmers should embrace an agritourism-based business model. There are many options available to North Carolina Century Farms that may wish to adopt a less traditional business model, and an approach other than agritourism may be more appropriate in some cases. Every farm operation should be addressed on an individual basis.

Additionally, while this thesis makes the argument that diversified business models such as agritourism are the way of the future for small farms, many farm owners are skeptical of this notion and hesitant to deviate from the traditional farming strategies, which have served them in the past. Considering that many farms have operated in the same traditional manner for over 100 years, it is only natural for owners to question why the tried-and-true methods that have kept their farms alive for many generations should suddenly be abandoned. However, those individuals should realize that in no way does this thesis contend that traditional small-scale farming practices are obsolete or recommend abandonment of any practices which may still prove valuable to a particular farmer. Rather, it simply aims to encourage adaptability to today’s evolving market needs.
CHAPTER 2
THE PARADIGM SHIFT IN AGRICULTURE

This chapter first describes farming at the national level and then narrows its focus specifically to North Carolina. A description and assessment of the current status of farming is provided; and we learn that on both levels farming has transitioned from a period where everyone hunted, fished, and gathered to our current scenario where there is a range of farming activity from the small, family-owned farms to large farm dominance. Over the years, increases in farm machinery led to increases in farm productivity and decreases in farm labor. Both the nation and state moved from a culture of a close relationship with the land to one where people learn about food at the grocery store or through advertising. The last part of this chapter explores agritourism as the new tool for educating the general public about farming. Agritourism is described as an up and coming movement that many farmers are partaking in in order to generate additional income to help adapt and sustain the farm in today’s culture.
History of Farming in the United States

Since the dawn of their existence, humans have required food to survive. In earlier times, people sustained themselves primarily through methods such as hunting, fishing, and gathering nuts and berries. It was during the Neolithic Revolution when humans first began to discover agriculture and settlement as a viable way of life. The Fertile Crescent region first offered humanity the ability to grow an established population because the land there could be farmed.

Around 2500 BC, Native Americans first domesticated plants in what is now the United States, and when Europeans arrived on the North American continent, they brought with them many other new plants and animals. For centuries, Americans continued the practices of cultivating land and domesticating animals as a means of both feeding themselves and supporting development across the nation. Traditionally, this took place on small family farms and utilized animal and human labor to carry out the work. Near the end of the 1930s, however, vast technological improvements began to emerge which proved transformative for the agriculture industry. In particular, the introduction of mechanized farm equipment and new chemical inputs allowed farm productivity to skyrocket.

U.S. agricultural output more than doubled between 1948 and 2011, with growth averaging 1.49 percent per year. Though total annual use of agricultural inputs changed little since 1948, the mix of inputs used shifted significantly, with increased use of intermediate inputs (e.g., fertilizer and pesticides) and decreased use of labor and land. (Wang, Heisey, Schimmelpfennig, and Ball, 2015)
From complete reliance on animal power in 1900, farmers rapidly embraced mechanical power…. Tractors had essentially replaced animal power by 1970, and mechanical harvesting of crops (sugar beets, cotton, and tomatoes, for example) became routine by the late 1960s. Advances in plant and animal breeding throughout the century facilitated mechanization and increased yields and quality, enhanced by the rapid development of inexpensive chemical fertilizers and pesticides… (Dimitri, Effland, and Conklin, 2005).

As a result of these changes, direct on-farm labor has decreased, and the labor has moved to non-farm, but agriculture motivated job. Per the US Department of Agriculture, farms accounted for 21% of the U.S. labor force in 1930, whereas today they account for less than 10%. J. Lilly writes, “the agriculture we have today in the United States is unique. No nation has ever had so few people actively farming.” (Lilly, n.d.). In addition, the bulk of production came to be increasingly provided by a small percentage of very large farms. While there were 6 million farms in existence in 1930, today there are only 2 million – but they are much larger on average. Figure 2 illustrates this trend of farms shrinking in number but growing in size. It should be noted that the USDA’s definition of farm changed in the early 2000’s. Previously a farmer actually had to own his land for it to be considered a farm. Nowadays, rented land can be considered a farm, and thus what counts as a farm is much broader.
Now, it may not be clear to the average layperson where exactly the line is drawn between what is considered a small farm, and what in fact constitutes a large farm. The phrase “small family farm” conjures up visions of the pre-1930s farms which functioned both as homesteads and small commercial enterprises, but today the US Department of Agriculture defines a “small family farm” simply as any farm having gross cash farm income (GCFI) of less than $350,000 and whose ownership is comprised of related individuals. Figure 3 shows that in 2011, nearly 90% of all U.S. farms met this description, including farms operated as sole proprietorships, S corporations, partnerships, and limited liability companies. Mid-sized family farms - which generate between $350,000 and $1
million in GCFI - comprised just 5.7% of U.S. farms, and large-scale family farms, which generate $1 million or more in GCFI – accounted for less than 2.0%.
## Selected farm characteristics by farm type, 2011

<table>
<thead>
<tr>
<th>Item</th>
<th>Small family farms</th>
<th>Off-farm occupation</th>
<th>Farming-occupation</th>
<th>Midsize family farms</th>
<th>Large-scale family farms</th>
<th>Nonfamily farms</th>
<th>All farms</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total farms</td>
<td>353,922</td>
<td>909,872</td>
<td>567,214</td>
<td>118,253</td>
<td>123,009</td>
<td>38,541</td>
<td>3,857</td>
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<td>Distribution of:</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farms</td>
<td>16.3</td>
<td>41.9</td>
<td>26.1</td>
<td>5.4</td>
<td>5.7</td>
<td>1.8</td>
<td>0.2</td>
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<tr>
<td>Value of production¹</td>
<td>1.5</td>
<td>5.1</td>
<td>6.8</td>
<td>12.0</td>
<td>24.8</td>
<td>23.7</td>
<td>11.3</td>
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<td>GCFI class:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Less than $1,000</td>
<td>29.0</td>
<td>30.5</td>
<td>15.7</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
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<tr>
<td>$1,000-$9,999</td>
<td>43.2</td>
<td>40.3</td>
<td>30.0</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
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<tr>
<td>$10,000-$99,999</td>
<td>24.6</td>
<td>25.5</td>
<td>44.9</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
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<tr>
<td>$100,000-$149,999</td>
<td>1.5</td>
<td>1.6</td>
<td>9.4</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>$150,000-$349,999</td>
<td>1.8</td>
<td>2.1</td>
<td>na</td>
<td>100.0</td>
<td>na</td>
<td>na</td>
<td>na</td>
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<td>$350,000-$999,999</td>
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<td>na</td>
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<td>42.8</td>
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<td>na</td>
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<tr>
<td>$500,000-$999,999</td>
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<td>na</td>
<td>na</td>
<td>na</td>
<td>57.2</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>$1,000,000-$4,999,999</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>100.0</td>
<td>na</td>
</tr>
<tr>
<td>$5,000,000-$9,999,999</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>66.6</td>
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<tr>
<td>$10,000,000 or more</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>33.4</td>
</tr>
<tr>
<td>Acres per farm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land operated:</td>
<td>68</td>
<td>50</td>
<td>92</td>
<td>427</td>
<td>898</td>
<td>2,035</td>
<td>2,480</td>
</tr>
<tr>
<td>Mean</td>
<td>166</td>
<td>145</td>
<td>279*</td>
<td>1,022</td>
<td>1,587</td>
<td>3,309</td>
<td>4,927</td>
</tr>
<tr>
<td>Average person</td>
<td>0.664</td>
<td>0.690</td>
<td>1.180</td>
<td>2.592</td>
<td>3.474</td>
<td>8.060</td>
<td>38.638</td>
</tr>
<tr>
<td>equivalents of labor²,³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of hours worked by:⁴</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principal operator³</td>
<td>57.2</td>
<td>61.1</td>
<td>65.2</td>
<td>55.3</td>
<td>40.7</td>
<td>18.1</td>
<td>3.7</td>
</tr>
<tr>
<td>Spouse³</td>
<td>16.4</td>
<td>20.8</td>
<td>16.5</td>
<td>14.3</td>
<td>9.6</td>
<td>4.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Hired labor</td>
<td>16.0</td>
<td>7.8</td>
<td>8.6</td>
<td>14.9</td>
<td>33.9</td>
<td>57.6</td>
<td>74.4</td>
</tr>
<tr>
<td>Contract labor</td>
<td>1.6</td>
<td>1.5</td>
<td>1.8</td>
<td>3.4</td>
<td>4.3</td>
<td>10.6</td>
<td>18.1</td>
</tr>
<tr>
<td>Tenure:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full owner</td>
<td>87.0</td>
<td>73.5</td>
<td>64.9</td>
<td>31.6</td>
<td>15.6</td>
<td>13.0</td>
<td>23.4</td>
</tr>
<tr>
<td>Part owner</td>
<td>11.6</td>
<td>22.2</td>
<td>29.0</td>
<td>54.7</td>
<td>72.7</td>
<td>70.6</td>
<td>56.5</td>
</tr>
<tr>
<td>Tenant</td>
<td>1.4</td>
<td>4.3</td>
<td>6.1</td>
<td>13.7</td>
<td>11.7</td>
<td>16.3</td>
<td>20.2</td>
</tr>
<tr>
<td>Share of land rented</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part owners</td>
<td>46.0</td>
<td>56.4</td>
<td>49.3</td>
<td>51.1</td>
<td>61.9</td>
<td>64.5</td>
<td>54.0</td>
</tr>
</tbody>
</table>

GCFI = Gross cash farm income. na = Not applicable.

⁴The value of production measures the value of commodities produced in a given year, without the effects of inventory change. It is calculated by multiplying the quantity of each commodity produced by the price of the commodity.

¹One annual person equivalent equals 2,000 hours of labor, or 50 weeks per year times 40 hours per week.

²Includes paid and unpaid hours.

³Shares worked by other operators and unpaid workers are not shown separately.


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**Figure 3, Selected Farm Characteristics by Farm Type – 2011** (Family Farm Report, 2014 Edition)
As noted, large-scale farming operations account for a very outsized share of both production value and land operated despite comprising such a small percentage of total farms. Macdonald, Korb, and Hoppe write, “Large farms now dominate crop production in the United States. Although most cropland was operated by farms with less than 600 crop acres in the early 1980s, today most cropland is on farms with at least 1,100 acres, and many farms are 5 and 10 times that size.” (MacDonald, Korb, & Hoppe, 2013). Ferdman echoes, “The top 10 percent of farms in terms of size account for more than 70 percent of cropland in the United States; the top 2.2 percent alone take up more than a third.” (Ferdman, 2014). Figure 4 below illustrates their accounts.

**Figure 4: Share of Total Farms and Value of Production, 2004**

*Large-scale family farms account for 60 percent of production*

*Percent of U.S. farms or production*

*Figure 4: Share of Total Farms and Value of Production, 2004 (USDA Economic Research Service, 2007).*
So, what has driven this shift to larger-scale farming? The answer is a matter of economics. Discussing changes in the hog industry, one USDA Amber Waves article explains:

Economic competition and the incentive to maximize profits drive structural changes in the hog industry. If larger operations are more profitable than smaller ones, competitive pressures should result in larger average farm sizes in the long run. Similarly, operations that are first to adopt a cost-saving technology in regions with lower input costs or closer to markets have a competitive advantage that makes them more likely to survive and grow. (McBride & Key, 2014)

According to the *Structural and Financial Characteristics of U.S. Farms, 1995: 20th Annual Family Farm Report to Congress*, corporate farms made on average $523,000 more annually than did farms operated as sole proprietorships. Similarly, farms organized as partnerships out-earned sole proprietorships by an average of $165,000. (Sommer, Robe, Hoppe, Greene, and Korb, 1998). So, it does appear that the larger operations are indeed proving to be more profitable. But while the higher average incomes enjoyed by corporate farms may at first glance paint larger-scale farming as beneficial to the agriculture industry, it is important to note that most small farmers do not reap those benefits. In fact, many small farmers experience concern that they may lose their livelihoods to the larger farming entities.

Given this competitive pressure, many of today’s smaller farms choose to embrace
a production method known as “contract farming.” Farmers who work contractually usually specialize in growing one product en masse which they can then sell to one or more specific buyers with whom they have made agreements. In many cases, they do not personally own the livestock they raise or even make management decisions pertaining to their care. Rather, farmers who own housing for confined animal feeding operations (CAFOs) follow a system of care prescribed by an “integrator” – usually a very large corporate entity.

This production method can be very advantageous to a small farm. For example, say that Farmer A arranges to raise only chickens, which he will then sell to Tyson Foods for processing and sale to end users. Because he is able to specialize purely in poultry and streamline his processes, he can now confine as many as 30,000 chickens in one house, grow them out more quickly and efficiently than Farmer B who has a pastured or open-air flock, and enjoy a competitive advantage as a result. It is for this reason that, according to the USDA, forty percent (40%) of farms today with gross cash farm incomes between $150,000 and $349,999 have contracts for growing livestock and are involved in CAFOs. Fifty-four percent (54%) of mid-sized farms operate on contract, as do roughly sixty-two percent (62%) of large farms. The strategy represents a significant shift from the traditional farming practices of the past, though, which saw farmers personally handling many different aspects of agricultural production. Figure 5 depicts how the specialized, bulk production strategy has resulted in a dramatic decrease in the percentage of U.S. farms raising certain animals.
Figure 5: Livestock on U.S. Farms: 1900-2010 (DePillis, 2013)
Figures 6 and 7 show that since 1960, real on-farm incomes have decreased while off-farm incomes have increased, and that the average shares of total U.S. farm household income that is derived off-farm has increased by approximately 30%.

Figure 6: Farm Household Income, U.S. Average, 1960-2004 (USDA Economic Research Service, 2007)
Some of the change in income share can be accredited to hobby farmers, or those who do not want to farm full time. However, for those that do want to farm full time must get creative and consider expanding their business models. Farms of any size can potentially benefit from diversifying their offerings.
History of Farming in North Carolina

North Carolina has not always been considered prime farm country. In fact, when settlers first arrived in the eastern part of the state, they found the land to be largely unsuitable for planting crops, and in those early years chose to concentrate primarily on timber production instead. Most North Carolina farmers struggled to even subsist. They got their break in the 1800s, however, when it was discovered that flue-cured tobacco, a new and exciting innovation at the time, could grow well in the sandy soil of eastern North Carolina. Flue-cured tobacco would dominate the state’s agriculture industry for over a century, with many of the world’s largest tobacco companies contributing substantially to the North Carolina economy.

When the Great Depression hit the nation, demand for tobacco decreased, however. Farmers grew more of the crop to compensate for the losses, but the increase in production only depressed prices further. In 1938, in an effort to bolster the industry, the United States government established a quota and allotment system to control the number of acres committed to the crop. This price support system provided income stabilization for many small North Carolina farms for decades, but in 2005, when the U.S. government finally decided to end the quota system and get out of the tobacco support business, the crop became open to the free market. According to Blake Brown, a professor of agriculture and resource economics and author of a paper titled “U.S. Tobacco Situation and Outlook”:

Tobacco production moved to Eastern North Carolina following the deregulation because it is one of the most cost-effective areas to grow tobacco in the country.
The number of tobacco farms in the U.S. has steadily decreased over the past decade. From 2002 to 2012, the number of tobacco farms in the U.S. decreased by 72 percent. Specifically within North Carolina, the number of tobacco farms declined by 66 percent. This sizeable decrease in the number of farms is because many smaller farms are being consolidated into larger farms. (Hjelmquist, 2014)

Most tobacco acreage today is grown under a marketing contract. In other words, the farmer owns the crop, land, and equipment but produces an agreed-upon quantity for a specific company under a contract.

While North Carolina may be synonymous with tobacco, other important crops in North Carolina’s agricultural history have included cotton, corn, soybeans, peanuts, wheat, livestock, poultry, eggs, fruits, and vegetables (especially sweet potatoes). Many of these crops remain important to the North Carolina economy, and today the farming industry contributes more than “$78 billion to the state’s economy, accounts for more than 17% of the state’s income, and employs 16% of the work force.” (100 Years of Farming Heritage, 2015). Bryan Mims, a guest writer for “Our State Magazine”, writes, “Farms provide us North Carolinians with a deep-rooted sense of identity. They cultivate our state’s image and give our landscape its texture.” (Mims, 2015).

Historically, North Carolina farms have been relatively small. In 2014, according to the North Carolina Department of Agriculture, the average North Carolina farm was just 170 acres in size – less than half the national average of 438 acres. However, in recent years the state has experienced the same shift towards large-scale industrial farming that
has been seen throughout the nation as a whole. On their website, the North Carolina Department of Agriculture - Person County Cooperative Extension notes:

In 1986, the state had 15,000 hog farms. Of these operations, 13,000 had less than 100 hogs and pigs, and only 800 operations had more than 500 hogs and pigs. Total hog inventory was 2.4 million head. By 2000, the total operations with hogs and pigs had decreased to 3,600. Operations that had less than 100 head controlled less than 1 percent of the total inventory of 9.6 million head. The 1,500 operations with more than 1,000 hogs controlled nearly 99 percent of the inventory, nearly 9.5 million of the June 1, 2000 total inventory. (Person County Cooperative Extension, 2003).

The reduction in the number of small family farms in North Carolina has been so profound that the state is now a national leader in terms of lost farms and lost farmland. Per the Conservation Trust for North Carolina, in the one-year timeframe between 2010 and 2011, North Carolina lost 1,000 farms and 100,000 acres of farmland fell out of productive use. This unfortunate trend may be able to be slowed or stopped, however, if small North Carolina farmers can begin to embrace new practices and diversify their business models.
The Agritourism Movement: Defining its Importance in Today’s Culture

In reviewing trends in the agriculture industry both at the U.S. and North Carolina levels, it becomes apparent that the full time small-scale farms, which once dotted the American landscape, are nowadays closing shop in record numbers. The industry has moved toward industrial farming, and many full-time small farmers are contracting with large corporations and/or working off the farm to generate additional revenue for their farms. Figure 8 depicts the decline in agricultural jobs.

Figure 8: Agricultural and Nonagricultural Employment, 1910 to 2005 (USDA Economic Research Service, 2007).
Today, agriculture makes up less than 2% of the labor force, while 80.7% of all Americans live in metropolitan areas. In the last 10 years alone, the urban population has increased by 12.1%. (United States Census Bureau, 2012). As a result, many Americans have become increasingly disconnected from the rural landscape and increasingly ignorant as to how their food is produced.

This is changing, however, as some Americans are becoming increasingly concerned with what is in the food they eat, how it is grown, and how the natural environment in which it is cultivated is cared for. This growing consciousness affords farmers today with a new and unique market to serve, and an opportunity to educate, inform, entertain, and welcome visitors to their farms to partake in “agritourism.”

Agritourism has been around for a while, yet has recently grown in popularity. The American Farm Bureau Federation defines agritourism as:

…an enterprise at a working farm, ranch or agricultural plant conducted for the enjoyment of visitors that generates income for the owner. Agricultural tourism refers to the act of visiting a working farm or a horticultural or agricultural operation for the purpose of enjoyment, education or active involvement in the activities of the farm or operation that also adds to the economic viability of the site. (Frank, 2010).
It is a practice that is being adopted by many farms across the United States as a way to diversify farm operations and generate additional revenue by offering agricultural education and/or experiences to consumers. Gkoltsiou and Papadimitriou write,

Agritourism and more broadly rural tourism offer the opportunity to the current farmer and tourism entrepreneur to maintain or increase their income and preserve their natural resources, by maintaining their lifestyle. On the other hand, interactive experiences close to home that will help them get back to their roots. Modern consumers are not only looking for local, fresh, organically or naturally grown products, but are also interested in farm culture and agricultural heritage. Hence, agritourism offers them the opportunity to engage. (Gkoltsiou and Papadimitriou, 2013)
An agritourism-based farming operation can take on many forms, but “there are three agritourism basics: Have something for visitors to see, something for them to do, and something for them to buy” (Wolf and Bullen, 2009). *Agritourism: Ideas and Resources*, a publication by Martha Walker and the Virginia Cooperative Extension Service, cites the following examples of agritourism activities:

- Agricultural museum and displays
- Archery

*Figure 9: You-Pick Pumpkin Patch* (Photo by Lenny Rogers, [https://www.cals.ncsu.edu/agcomm/magazine/fall05/agritourism.html](https://www.cals.ncsu.edu/agcomm/magazine/fall05/agritourism.html))
• Barn dances
• Bed and breakfast accommodations
• Biking trails
• Bird watching
• Birthday parties
• Breweries
• Cabin living
• Campfires/Camping
• Canning produce
• Canoeing
• Corn mazes
• Corporate and group events
• Cut flowers (picking, arranging, and planting)
• Cut-your-own Christmas tree and evergreens
• Farm cooking contests
• Farm scavenger hunts
• Farm stores and markets
• Farm vacations (a day or a week on the farm: living, working, enjoying)
• Fee-fishing pond (fishing, cleaning, and cooking)
• Flower arranging workshops
• Haunted barns
• Hay wagon rides
• Heirloom plant and animal exhibits
• Herb walks
• Heritage trails
• Hiking paths (walking, identifying vegetation, determining a tree’s age, picnicking)
• Historic reenactments
• “How-to” clinics
• Hunting
• Ice cream parlor or bakery
• Jam- and jelly-making demonstrations
• Meeting barnyard animals (participating in educational programs focusing on each animal: shear the sheep, milk the “demonstration” cow, or participate in “cattle college”)
• Music events (banjo and guitar lessons), concerts, and festivals.
• Orchards and pick-your-own (picking, sitting, picnics under the trees)
• Pancake breakfasts
• Plant a garden
• Pony and horseback riding
• Pumpkin patch (picking, painting, carving, and buying)
• Quilting/weaving exhibitions
• Restaurants/dining (farm food, slow dining, Sunday brunches, or local foods)
• Snow sledding
• Sorghum milling
• Stargazing and moonlight activities
• Storytelling/story swaps
• Straw bale maze
• Tours for children and families
• Vegetable contests
• Weddings
• Winemaking and tasting
• Wineries

(Walker, 2009)

Maetzold writes that agritourism activities, such as those listed above, almost always fall into one of the following “target market” categories:

1. Farm markets and specialty products
2. Product processing
3. Fairs, festivals and special events
4. Horses and other farm animals
5. Unique dining experiences
6. Wildlife and fish
7. Nature-based recreation
8. Floriculture
9. Education
10. Heritage and culture
11. Arts and crafts
12. Farm/ranch stays
13. Tours and touring

14. Pick, cut, gather or grow your own

(Maetzold, n.d.)

Farmers who are interested in expanding their business models to include agritourism activities have a significant and growing body of knowledge and resources at their disposal. The Pick-Your-Own website (www.pickyourown.org) lists 40 state agritourism associations or agencies that are available to interested parties, and the Natural Resources Conservation Services section of the USDA publishes a useful resource manual containing 2,300 pages of reference material.

Not only are agritourism farms diverse in the activities they offer, but those activities can also be implemented on farms of practically any size. One USDA Amber Waves' magazine article reads:

...[A]gritourism farms vary greatly in size. Compared with other U.S. farms, agritourism farms are much larger on average (2,140 acres versus 387). But this difference is largely because the largest one-fifth of the agritourism farms operate very large ranches (8,740 acres on average) with relatively little cropland. They control 84 percent of farmland and more than half of woodland operated by all agritourism farms. As they have large areas of woodland (363 acres on average), hunting and fishing are likely agritourism activities on these farms, but some of them may operate dude ranches, provide overnight stays, or offer ranch tours, hayrides, or rodeos. The average size of the remaining four-fifths of agritourism
farms (433 acres) is only a little larger than the average of all other U.S. farms. Furthermore, 20 percent of agritourism farms operate less than 50 acres. (Bagi, 2014).

It is critical to note this twenty percent of agritourism farms which function on less than 50 acres, since Figure 3 revealed that 50 acres was precisely the size of the average small-scale farm whose primary steward supplemented the farm with an off-farm income. “The United States Department of Agriculture (USDA) estimates that more than 62 million people over the age of 16 visited farms during a one-year period in 2000-01. This does not count the numerous children and youth under 16 years of age...” (Wolfe and Bullen, 2009). For many agritourism operators, this not only provides a chance to profit from “admission” to their agritourism activities, but also represents a great opportunity for cross sales of farm-grown products, handmade crafts, baked goods, and other farm commodities.

Some agritourism farms engage in direct marketing of fresh foods to individual consumers and/or retailers, value-added agriculture (such as the production of beef jerky, fruit jams, jelly, preserves, cider, wine, and floral arrangements), generating renewable energy, and custom work (such as machine hire and hauling for other farms). All of these are considered non-traditional or niche activities that involve innovative uses of farm resources. (Bagi, 2014)

And considering those many and varied income opportunities, revenues for agritourism
farms can be quite substantial. In the year 2014, they were:

“$713 million from agritourism, $349 million from sales of fresh foods directly to consumers, and $63 million from custom work. On average, agritourism farms obtain 20 percent of their gross farm income from niche activities, including 7.1 percent from agritourism. Average income from agritourism is $20,670...” (Bagi, 2014).

Agritourism activities serve purposes beyond simply helping to boost earnings for struggling farms, however. They also function as a tool to reestablish interest among today’s metropolitan youth in a rural lifestyle. As a whole, the stewards of today’s rural landscape are aging, with a majority of family farmers being in their fifties, sixties, and even seventies. According to the USDA, “today, only about 6 percent of all farmers are under the age of 35” (USDA, 2014). *Figures 10 and 11 illustrate the burgeoning lack of young farmers.*
Figure 10: Average Age of Principal Operator, 1982-2012 (USDA NASS, 2012 Census of Agriculture)
The lack of agricultural involvement among young Americans is particularly noteworthy because the agritourism movement is a strong interest of some middle-aged and younger generations of our society. They are the faction of the population that has endured the strongest disconnect from the rural landscape throughout their lifetimes, and who are now looking for opportunities to experience agriculture through a new lens.

*Statistically Significant Change

Figure 11: Principal Operators by Age Group, 2007 and 2012 (USDA NASS, 2012 Census of Agriculture)
As a final benefit, agritourism offers the public the opportunity to get outside and be active. One comprehensive study of outdoor recreation trends by the Forest Service, U.S. Department of Agriculture, completed in 2012, notes that:

One overriding national trend is quite evident: the mix of outdoor activities chosen by Americans and the relative popularity of activities overall have been evolving over the last several decades. One general category that has been showing growth in the first decade of the 21st century is nature-based recreation. Between 2000 and 2009, the number of people who participated in nature-based outdoor recreation grew by 7.1 percent and the number of activity days grew about 40 percent...The clear growth area was within the overall group of activities oriented toward viewing and photographing nature.... (Cordell, 2012)

If successfully programmed, agritourism operations not only serve the small farmers whose incomes they could boost, but also the visitors who frequent them – by offering a space to enjoy, learn about, and reconnect with the natural environment and the agricultural opportunities that it provides.
Chapter 3 explores agritourism as a viable market for small-scale farms, and in particular North Carolina Century Farms. North Carolina Century Farms are of special interest in that they have been in continuous stewardship by a single family for one hundred years or greater. These farms often times have a close relationship to the land and community, and therefore can have a significant impact on those looking to learn more about the agricultural lifestyle. The second part of this chapter looks at a series of figures, which dive into more detail on the current trends and markets for agritourism operations. If North Carolina Century Farms want to transfer their business strategy to that of an agritourism model then it’s important for them to consider landscape architects as an aid in careful site planning for such operations. How might the two disciplines work together in order to create a successful farm?
Small family farms have often been called the backbone, or the beating heart, of rural America. They have always played a pivotal role in the North Carolina economy. Even today, many North Carolina communities rely heavily on small-scale agriculture production as a means to remain vibrant. There are some economic benefits to large farms, but these small farms provide differing social and economic benefits to their communities. Small farms are not necessarily better in every way, yet according to Lobao and Stofferahn, “states with anti-corporate farming laws have lower poverty rates, lower levels of unemployment, and a higher percentage of farms reporting cash gains than
agriculture-dependent counties in states without anti-corporate farming laws.” (Lobao and Stofferahn, 2007).

In addition to their economic advantages, the small family farms which dot rural towns throughout America also provide an important sense of place to their communities and contribute enormously to preserving the natural environments which characterize them. Speaking to the importance of such conservation efforts, Wendell Berry writes in his book *The Unsettling of America: Culture and Agriculture*, “the soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life.” (Berry, 1977). One USDA study cites:

The share of assets and land held by small farms is substantially more than indicated by their 25-percent share of production. Small farms hold about 68 percent of all farm assets, including 61 percent of the land owned by farms....

Because of their large land holdings - in aggregate - small farms are important in conservation efforts. Small farms account for 82 percent of the land farmers enrolled in the Conservation Reserve Program (CRP) and Wetlands Reserve Program (WRP). (USDA Economic Research Service, 2007).

Programs such as the CRP and WRP only preserve land from development, and do not say anything about production practices. Thus some small farms can still be detrimental to preserving the land.
Even among their small peers, though, North Carolina’s Century Farms represent probably the truest embodiment of time-honored farming traditions. As laid out by the North Carolina Department of Agriculture, North Carolina Century Farms are those that have maintained continuous ownership by a single family for 100 years or more. According to the North Carolina Department of Agriculture, there are three criteria that must be met in order for a farm to be honored as a Century Farm:

1. Ownership of Property by Family for 100 Years of More: This can be determined from an abstract of title or original records such as original deed or land patents. Other authentic land records may be acceptable in some cases.

2. Continuous Family Ownership: The farm (in whole or in part) must have been in continuous family ownership. Title to the century property today must reside in a blood relative of the original owner, or a legally adopted child of the descendant. Continuous residence in the state or on the property is not required, but the title to the property must be continuous. An abstract of title is the best evidence of continuous family ownership.

3. Only One Certificate Issued Per Property: There shall be only one certificate issued for a piece of property. For example, a descendant may not receive another certificate if a former owner or relative has already received a certificate for the same property.

Century Farms are unique in that they have managed to survive for so long under the care of a single bloodline. And much like specimen trees amid a new growth forest, Century Farms remain cherished pillars of their communities today as a result of this longevity. Collectively, they have an immense impact on the social fabric of the state. According to Lobao and Stofferhan,

Community social fabric refers to social organization, the features of a community that reflects its stability and quality of social life. Impacts on community social fabric are seen in social indicators such as: population change; social disruption indicators (crime rates, births-to-teenagers, social-psychological stress, community conflict, interference with enjoyment of property); educational attainments and schooling quality; changes in social class structure (decline of local middle class,
in-migration of low wage workers); health status, such as mortality rates; civic participation (e.g., declines in church attendance, voluntary organizational membership, and voting); and changes in local governance, such as loss of local control over community decision-making, and resource/fiscal pressures on local government, such as those due to increased need for social services and diversion of public funds to subsidize agribusiness development. (Lobao and Stofferhan, 2007)

Unfortunately, though, as full-time small farms continue to disappear from the North Carolina landscape, Century Farms are not always spared. Figure 14 depicts the number of Century Farms that can be found in each North Carolina county.
Figure 14: Number of North Carolina Century Farms Per County - 2017
As is apparent, the majority of N.C. Century Farms (1,613 out of 1,777) are located within the coastal plain and piedmont regions of North Carolina. Johnston (88), Sampson (68), and Robeson (69) Counties contain significantly more N.C. Century Farms (225 combined total) than any other counties. But it is these counties with the largest numbers of Century Farms that are losing farms in the greatest numbers. It is unknown if these being lost are Century Farms, yet less farms in general means a smaller pool of potential Century Farms in the future. On its website, The Rural Advancement Foundation International, posted a map showing net changes in farm numbers for the time period beginning in 2007 and ending in 2012, and in this five-year timespan, counties such as Sampson and Robeson lost between 152 and 219 farms. Johnston County, which has the most Century Farms of any county in the state, lost between 110 and 152 farms. There was a point in time when most people had a connection to a farm, but nowadays farms are disappearing, and as a result the farming culture is ceasing to exist.

Given that the 225 N.C. Century Farms located in these counties are all located within close proximity (less than a two-hour drive) to most major cities in North Carolina, however, there is hope for them to turn around and remain viable for many years to come. This is because they are actually very well-suited to serve as education centers for urban residents who today want to experience farm culture, local food revival, etc. – if their stewards are willing to take on the challenge of adopting an agritourism model.

Planning for the future of such Century Farms is of great importance if a high quality of life is to be preserved in their rural communities. And landscape architects, having been trained in environmental, social, behavioral, economical, and aesthetic design of outdoor public and private areas, can help provide Century Farmers with a
framework to remain viable in the future, while still paying homage to their farm’s histories, by helping to develop and execute agritourism-based business models.

North Carolina's Agritourism Market

“North Carolina remains among the most diversified agricultural states in the nation, producing more than eighty commodities across a state that rises to an elevation of more than 6,000 feet in the western mountains and extends to the eastern sandy plains along the coast.” (Yeboah, 2016). Yet, North Carolina’s agritourism industry is as diverse as its natural landscape. The sector has seen a dramatic increase in startups in recent years, and most North Carolina agritourism operations are in fact relatively fresh ventures. As Figure 15 illustrates, 81% of North Carolina’s agritourism operations came into existence only in the years since 1995, and 43% did not begin until after 2005.

![Figure 15: Poll: In What Year Did Your Agritourism Operation Begin? (Xu, S. and Rich, S.R., 2012.) (381 respondents in 2005, 267 respondents in 2012)](image-url)
But what do all the state’s exciting new agritourism operations look like? What activities do they offer, and when? Who visits them, and why? By studying existing North Carolina agritourism farms, answers to important questions like these may be obtained. The following figures illustrate empirical data gathered from such agritourism enterprises. From this data, many insights can be garnered into which practices tend to be most successful when programming an agritourism operation.

“Where are most of North Carolina’s agritourism operations located?” Figure 16 depicts that the majority (50%) of existing agritourism farms are located in the state’s piedmont region.

Figure 16: Primary Region Agritourism Operations Are Located – 2012  (Xu, S. and Rich, S.R., 2012.) (267 respondents in 2012)

This could be due in part to the fact that a majority of North Carolina’s population lives within the piedmont region, and therefore the pool of potential clientele is much greater within this area than in the mountain and coastal plain regions. It is important to note that only 18% of the state’s agritourism farms are found within the coastal plain region, yet a
majority of North Carolina’s Century Farms (particularly Johnson, Sampson, and Robeson counties) are located there. Farms in this part of the state that are interested in becoming agritourism sites may need to place an emphasis on programming their operations to attract longer-distance visitors, such as those from the more populous piedmont region.

“What activities are most commonly found in agritourism operations?” According to Figure 17, the most popular activities (ones which are offered by more than 30% of operations) offered by agritourism operations include: farm tours, retail/souvenirs/processed goods, school trips, hands-on activities, special events/festivals, U-pick plots, and barnyard animals/petting areas.
Of these, farm tours, school trips, and special events/festivals are all activities that typically draw large groups of people to agritourism operations. Therefore, for facilities that hope to host these sorts of activities, it is paramount that their sites be properly designed to handle crowds. Accommodating staff for such events will be an important factor to consider as well. Recreational activities such as day camps, riding trails, and fee fishing are not offered at most agritourism operations.
“What times of the year are agritourism operations open?” Figure 18 indicates that the most North Carolina agritourism operations today are open throughout the spring, summer, and fall, and that nearly 50% remain open during the winter months as well.

Figure 18: Poll: What Season(s) Is Your Agritourism Operation Open? (Xu, S. and Rich, S.R., 2012.)

Most of North Carolina experiences only mild winters, which allows these farms to remain operational even during the colder months of the year. Overall, agritourism farms reported being open for much more of the year in 2012 than they did in 2005. It can be inferred that this is at least in part due to an increase in demand from visitors. Many farmers are also now offering multi-seasonal components to their agritourism operations, which allows them to host visitors year-round and ultimately increase revenues.
“How much money do agritourism farms bring in each year?” Per Figure 19, the largest faction (32%) of farmers reported total annual gross agritourism incomes of $1-$9,999 in 2012.


At first glance, this figure does not bode well for agritourism farmers, suggesting that despite their additional hours of operation, one-third still report less than $10,000 in annual income. However, the number of farmers who reported these minimal gains has decreased 20% just since the study was first conducted in 2005 while the number of farms reporting incomes of $50,000-$249,000 and greater than $250,000 have increased by 7% and 4%, respectively. This data suggests that agritourism incomes are on the rise.
– a fact that is sure to encourage any farmer considering adopting agritourism practices. Additionally, it is important to note that these are agritourism incomes only, and do not take into account other income from the rest of the farm operations – so even the gains which seem smallest can make a meaningful difference in whether or not a small farm is able to continue operating.

“As Who visits agritourism farms?” As Figure 20 shows, a vast majority (76%) of visitors to agritourism farms come with their families. 46% are parents visiting with their children, 13% are grandparents visiting with their grandchildren, and an additional 17% are multiple families visiting together.

This indicates that North Carolina agritourism operations should be family-oriented. It also means that older generations should be accounted for since they are in fact visiting in
significant numbers. For example, proper shade and accessibility is of particular value to elderly visitors. It is important to discern the clientele that most frequently visit farms, as establishing a market is probably the most significant factor in determining if an agritourism operation will be successful. If farms can properly program their offerings toward important target markets, then over time they will see greater gains in agritourism income.

“Do these visitors ever return?” Figure 21 shows that visitors to agritourism farms are split roughly in half between first-time and repeat visitors. This indicates that many farm patrons do indeed come back time and time again.

![Pie chart showing first-time visits and repeat visits](image)

Figure 21: Poll: Was This Your First Time Visiting The Farm? (How Beneficial is Agritourism? North Carolina Farmers and Residents Respond, 2014)
“Do visitors enjoy spending time at agritourism operations?” Figure 22 depicts that a majority of agritourism patrons enjoy their experience. This is good, as satisfied visitors are more likely to spend money while visiting the farm as well as provide valuable word-of-mouth advertising.

![Figure 22: Poll: How Would You Rate Your Most Recent Visit to the Farm? (How Beneficial is Agritourism? North Carolina Farmers and Residents Respond, 2014)]
“Why do people choose to visit agritourism farms?” As Figure 23 denotes, visitors to North Carolina agritourism farms come for a multitude of reasons.

But the top two that visitors and farm operators identify are “spending time outside” and “family activity.” “Convenient location” and “something to do close to home” were both heavily weighed factors as well, which make a farm’s location an important factor to consider when contemplating opening an agritourism operation. On the other end of the spectrum, farmers and visitors alike placed low emphasis on “learning how to use farm products” as a reason for people to visit an agritourism operation. And while agritourism operators placed high importance on “personal sales,” reinforcing the idea that farmers

Figure 23: Poll: How Important Were Each of the Following Reasons for Making the Visit to the Farm? (How Beneficial is Agritourism? North Carolina Farmers and Residents Respond, 2014)
aim to spur cross sales of farm commodities, farm patrons did not rate this as a top reason to visit.

“Will people make a special trip just to visit an agritourism destination?” Figure 24 suggests so, indicating that 44% of visitors visited only the farm and then returned home.

![Figure 24: Poll: What Was the Primary Reason for Visiting the Farm? (How Beneficial is Agritourism? North Carolina Farmers and Residents Respond, 2014)](image-url)
“How much thought/planning do people put into visiting an agritourism farm?”

Figure 25 illustrates that most visitors to the farm do not plan extensively in advance before making such an excursion.

*Figure 25: Poll: How Far in Advance Did You Plan Your Visit? (How Beneficial is Agritourism? North Carolina Farmers and Residents Respond, 2014)*

*Figures 24 and 25 further indicate that many visitors to agritourism farms are looking for day excursions that they can access conveniently and on short notice. It can also be inferred, then, that many city dwellers are attracted to agritourism operations as spur-of-the-moment, convenient family weekend escapes into nature.*
“What benefits can a farmer derive from operating an agritourism farm?” As mentioned previously, a majority of farmers embrace agritourism practices as a way to generate additional farm income. However, there is a great deal of gratification to be found in running an agritourism operation beyond just the financial benefits. Figures 26 and 27 summarizes some of the primary reasons that North Carolina farmers today are opening up the idea of introducing the general public to their operation.

![Figure 26: Importance of Benefits Agritourism Provides – Farm Operator’s Opinion](image)

(Scale ranged from “1 = Very Unimportant” to “5 = Very Important”. Farmers’ responses were weighted)

*Figure 26: Importance of Benefits Agritourism Provides – Farm Operator’s Opinion (How Beneficial is Agritourism? North Carolina Farmers and Residents Respond, 2014)*
According to farm operators, educating the visitors and public about agriculture and preserving farms/farmland are the two greatest benefits of agritourism. Similarly, North Carolina residents also believe that the primary benefit of visiting an agritourism farm is to gain a better understanding of an agriculture lifestyle. Improving relationships between farmers and the local community is of high importance to both farmers and visitors as well, which can ultimately lead to greater support of the local economy and local foods movements. Notably, both farm operators and visitors report that aesthetics and recreational activities are the least beneficial socio-economic benefits of agritourism. However, nature-based recreation is a growing trend and should still be duly considered when starting an agritourism operation.

Figure 27: The Socio-Economic Benefits of Agritourism (How Beneficial is Agritourism? North Carolina Farmers and Residents Respond, 2014)
Programming an Agritourism Business: Things to Consider

There are many things a small farmer must consider when developing an agritourism operation. Perhaps the most elementary consideration is whether or not the farmer is the type of individual who would actually enjoy running an agritourism business. Agritourism is not for everyone, and the LSU AgCenter Research and Extension Service notes that one should assess their personality before committing to such an endeavor. “Do you enjoy people? Are you a good communicator? Are you patient? Are you organized? Can you adapt to change?” (Hatch, n.d.) These are all questions that a farmer should ask oneself before committing to developing an agritourism business.

If it is determined that a farmer does want to proceed with an agritourism operation, though, then it becomes advisable to consult with a professional. A landscape architect can prove a very valuable resource throughout the planning process. While landscape architecture and agriculture are both very large and diverse disciplines, with proper structuring the two professions can collaborate very successfully to realize countless business and design opportunities. It is important that farmers looking to enter the agritourism market consider all the business, social, and ecological aspects of agritourism, and a landscape architect can offer great insight into all of these.

*Figures 28 and 29* detail a set of questions, published by the Agritourism Office of the North Carolina Department of Agriculture and Consumer Services, which all farmers and landscape architects should consider when reconfiguring a farm’s business plan to include agritourism offerings.
STARTING YOUR AGRITOURISM VENTURE

An agritourism farm is a value-added farm or ranch that provides pleasure as well as recreation, information, education or other experiences or services for which the public may or may not pay admission to participate in and/or purchase an agricultural product or activity.

The following questions provide a starting place for farmers interested in developing agritourism farms.

First Steps
1. What do you want to do? Do you have a firm idea of your goal(s) for your agritourism farm?
   - Have you made a list of the activities you want to provide?
   - Have you made a list of the resources, both natural and man-made, that you have available on the farm and which are attractive to agritourism venues?
2. Who do you want to serve? Ages, size of groups, how often?
3. How much do you have to invest?
   - Time
   - Money
   - Other resources
4. How ready are you? How far along are you?
5. When do you want to open for business? Do you have a timetable or schedule?
6. Do you want to provide an educational program?
7. Do you have historical or cultural information to provide?

Beginning a Business
8. Do you have a business plan? A strategic plan?
9. Do you know your land use rights?
10. Do you want to charge for your services? Do you know how much money you need or want to make?
11. Have you talked with your insurance agent about the probable need to increase liability coverage? Do you need or want to provide health insurance for employees?

Other Support Agencies
12. Have you talked to the NCDA&CS Food and Drug staff, the Marketing Division, or the NCSU Food Science staff to see what resources are available to help you with value-added processes, such as processing a commodity before it is marketed or changing the way a product is packaged?

Local Issues and Regulations
13. How much of your current land holdings do you plan to use? Are you planning to buy more land? Is the use of any of your land prohibited for agritourism activities? Have you talked to the local planning/zoning board?
14. Are there other agritourism farms nearby that could compete with you?
15. Are there land, water or wildlife issues that might impact your plans?
16. Have you researched local legal and liability considerations or regulations such as planning and zoning, health, environmental quality through your local agricultural extension offices, business and economic development offices, Secretary of State, and tax offices? Does your county have zoning ordinances which are helpful to agritourism? Has your county adopted Voluntary Agricultural Districts (VADs)? Enhanced Voluntary Ag Districts?

Figure 28: Starting Your Agritourism Venture Part I (Marta Glass, 2011)
Figure 29: Starting Your Agritourism Venture Part II (Marta Glass, 2011)

Of these guiding questions, “what do you want to do?” is perhaps the most important for a farmer to consider when starting an agritourism operation – as any enterprise tends to be
more successful if its principal operator is genuinely interested in and passionate about the work he or she is doing. It is also important, however, to conduct a site inventory and to analyze what activities the farm itself is best suited for. Some sites are better equipped for certain activities than others (not all agritourism farms can offer wedding venues, for instance) and specific program elements should be developed such that they will best serve the farm’s overall business direction. In determining what agritourism activities to offer, a farmer should also consider which ones their competitors offer as well as what makes their own operation unique. In the case of North Carolina Century Farms, for example, there is tremendous value in the fact that the land has been maintained and operated by a single family for 100+ years. Therefore, farms of this caliber which aim to embrace agritourism should almost always offer historical tours to visitors, among potential other activities. Since few agritourism operations can offer as much history, or as rich an understanding of and connectedness to the land, playing to that strength is a great way for Century Farms to differentiate their operations from the competition.

If determining “what to do” is the most crucial step of starting an agritourism enterprise, though, then “setting goals” is a very close second. After all, these goals will ultimately help a farmer determine what his or her end results should be. Most agritourism operations are started as a means of generating additional farm income, and it is often very important to factor in how much additional revenue the farm needs to generate in order to remain viable. This will help determine the program elements offered as well as set prices for many of the farm’s commodities.

Once goals have been set and activity offerings determined, it then becomes important for farmers to consider the various bureaucratic requirements that will come
with entering the agritourism business. There are a number of rules and regulations which agritourism farmers must adhere to, as noted under the category “Local Issues and Regulations” in Figure 28. Typically, the type of agritourism operation will dictate which specific regulations (local, state, and national) apply in an individual case, but as detailed in Regulations that May Affect Your Agritourism Enterprise, a research project primarily investigated by Kent Wolfe and Gary Bullen, most regulations fall into one of three categories:

1. General Regulations – Regulations that likely affect a majority of agritourism enterprises.
2. Employment Regulations – Regulations that affect enterprises that are likely hiring personnel.
3. Permit & License for Particular Attractions – Regulations specific to certain types of attractions.

(Wolfe and Bullen, 2009)

General regulations include, but are not limited to: zoning ordinances (i.e. land use, local building codes, tree protection, etc.), Animal Welfare Act, food safety and public health laws, business licenses, and proper accessibility requirements (i.e. Americans with Disabilities Act). This is a category of regulations in which landscape architects can prove most beneficial to a farmer considering an agritourism operation. Although they are not lawyers, landscape architects are design professionals who can help prepare plans and documents required for permitting.
They can also help farmers minimize certain risk exposures through their designs, such as by ensuring that agritourism farms offer their patrons proper accessibility in compliance with ADA standards. According to the National Agricultural Law Center, “liability is a significant concern for farmers, ranchers, and others who operate agritourism enterprises. Simply stated, a landowner who opens his or her land to the public faces the risk that he or she could be considered liable if an entrant is injured while on the property.” (Agritourism – An Overview, n.d.). Fortunately, though, many North Carolina agritourism farmers take solace in North Carolina’s “Agritourism Limited Liability Law,” which went into effect beginning January 1, 2006. While it does not eliminate the need for liability insurance, this law serves to limit the various legal liabilities that agritourism businesses might otherwise face – more specifically, by restricting the ability of visitors to press charges or seek damages for an injury or death sustained while on the premises of an agritourism operation. It applies to both for-profit and non-profit operations, and is effective as long as the operation has a warning notice posted at their entrance stating the following:

“Warning: Under North Carolina law, there is no liability for an injury to or death of a participant in an agritourism activity conducted at this agritourism location if such injury or death results from the inherent risks of the agritourism activity. Inherent risks of agritourism activities include, among others, risks of injury inherent to land, equipment, and animals, as well as the potential for you to act in a negligent manner that may contribute to your injury or death. You are assuming the risk of

The limited liability law is not a guarantee if the farm owner is negligent or has not taken reasonable measures to ensure a safe environment. Farmers can further protect themselves by posting signs near unsafe areas such as bodies of water/livestock/equipment storage, and farmers can ensure proper fencing, and locked gates to close areas off from public access.
CHAPTER 4

DESIGN PRECEDENTS

Discussed below are four different farm operations in North Carolina. The first two farms, Hickory Nut Gap Farm and Mike’s Farm, were chosen for review because their agritourism programming is greatly diversified. Hickory Nut Gap Farm has relatively large acreage whereas Mike’s Farm is smaller scale. The third case study, Fickle Creek Farm, was chosen as a case study based solely on its livestock, vegetable, and fruit productions, and the farm’s bed and breakfast accommodations. Fickle Creek Farm is considered more of a working farm however, it provides information regarding the acreage needed for rotational livestock paddocks. The last precedent considered, Greenlands Farm, is the smallest of all the case studies and offers insight on how a very small operation might incorporate agritourism endeavors. Lastly, a comparison of the four case studies is examined in order to comprehend successful commonalities and differences amongst the varying farms.
Figure 30: Case Studies: Context Map (Map Base: www.googlemaps.com)
Hickory Nut Gap Farm is a relatively large agritourism farm located in Fairview, North Carolina. The farm was first established in 1916 when Jim and Elizabeth McClure purchased what was then the Sherrill’s Inn and surrounding farmland. Over the course of many years, Hickory Nut Gap Farm became home to what is now five generations of McClure family descendants. Today the total farmland is co-owned by six grandchildren of Jim and Elizabeth. Husband and wife, Jamie and Amy Ager, own the Hickory Nut Gap Farm agritourism business and brand, which sits on roughly 324 acres.

Hickory Nut Gap Farm is in the mountain region of North Carolina. As noted in Figure 32, Asheville, NC, Hickory, NC, and Boone, NC are the only major cities within a 150 mile range of Hickory Nut Gap Farm. That being said, the greater Ashville area has a population of 425,000 people, which makes it the largest city in the region (11th largest in the state of NC). Being that Asheville is only 25 miles away Hickory Nut Gap Farm draws a lot of visitors from the city.
Figure 32: Hickory Nut Gap Farm: Context Map (Map Base: www.googlemaps.com)
A top down analysis of Hickory Nut Gap Farm, *Figure 33*, describes the farm’s location and modern day layout. Hickory Nut Gap Farm’s total acreage is divided roughly in half by Charlotte Highway. Charlotte Highway is a primary, two-lane vehicular corridor, and is used as a major route between Asheville, NC and Lake Lure, NC. The farm has concentrated its agritourism operations to the east of Charlotte Highway, however Sugar Hollow Road, a secondary roadway, does divide the farm’s agritourism components. The historic Sherrill’s Inn (accommodates weddings, overnight guests, etc.) is not part of the Hickory Nut Gap Farm agritourism business, but is situated in the heart of the site’s boundary. Sherrill's Inn is roughly a two-mile drive from Hickory Nut Gap Farm’s primary zone of agritourism operations.

*Figure 33: Hickory Nut Gap Farm: Site Aerial, Acreage, and Analysis*
One of the most fascinating aspects of Hickory Nut Gap Farm is its pristine setting. As rendered in *Figure 34*, dense tree canopy covers thousands of acres adjacent to the farm. Even within the farm’s parcel boundaries there are hundreds of acres that have not been developed. This preserved area abuts the Sherrill’s Inn parcel, and is a result of smart planning by Jamie and Amy Ager. As of 2008, Hickory Nut Gap Farm has been permanently protected through a conservation easement with the Southern Appalachian Highlands Conservancy. Owners Jamie and Amy Ager have stated, “By resolving questions about how the land will be managed going forward, the stage is set for working together to protect Sherrill’s Inn and the other cultural and historical resources.” (Southern Appalachian Highlands Conservancy Press Release, 2009). The land within the conservation easement cannot be developed for any purpose other than farming.

*Figure 34: Hickory Nut Gap Farm: Site Conservation Aerial*
In order to get a better understanding of Hickory Nut Gap Farm’s history and agritourism practices, interview guide questions were sent to representatives of the farm. Figure 35 are the responses received from Kelsey Winterbottom, a farm hand, and farm owners, Jamie and Amy Ager.
1) Has your farm been in your family for multiple generations? If so, how long has your farm been a family owned & operated endeavor?

The farm was established in 1916 by Jim and Elizabeth McClure. In 2000, Jamie Ager, a 4th generation member of the family, and his wife Amy Ager, took over the farm after meeting at Warren Wilson College.

2) What have historically been the primary farming practices on your land?

Apples, dairy, cattle, hogs.

3) What are the primary farming practices operated on your farm today?

Grassfed beef and pastured pork.

4) Is agritourism a part of your farm’s business strategy? If so, what forms of agritourism does your farm offer?

Yes – farm tours, farm fresh lunch from our kitchen, hayrides, corn maze, and educational field trips. In Sept. – Oct. we charge admission to the ground of the farm. We also have u-pick berries in the summer.

5) What season(s)/month(s) does your farm offer agritourism activities?

The Farm Store is open year round, and we really focus on agritourism in September and October.

6) What farming operations have been the most popular/profitable?

Grassfed beef, pastured pork, and agritourism – specifically the corn maze.

7) What farming operations have been the most work and difficult to implement? What has made those operations difficult?

We have had some safety issues with the hayrides. Also organic u-pick berries have been a challenge in recent years. Some years the berries produce well, other years they do not, and customers are disappointed.

8) If anything, what would you do different if given the chance to do it all over again?

“Not much” - Jamie

9) What advice would you offer other NC farmers looking to implement agritourism activities as an alternative/additional form of business methodology?

Focus on customers and giving folks an authentic farm experience. Have fun!

Figure 35: Hickory Nut Gap Farm: Responses to Interview Guide Questions (responses in red)
Grass-fed beef, pastured pork, and corn mazes are the most popular agritourism activities held. Hayrides and organic you-pick berries have been the farm’s most difficult agritourism operations implemented. You-pick plots are a common attraction for most agritourism farms, however the uncertainty of producing successful yields makes it a more risky endeavor. Hickory Nut Gap Farm’s livestock production is a year-round job, and the farm’s primary means of selling its meat is through an online store, an on-farm storefront, community supported agriculture (CSA) endeavor, and wholesale through regional distributors. Their meats are featured in both North and South Carolina markets, groceries, and restaurants. Hickory Nut Gap Farm primarily focuses on their agritourism operations during the summer and fall, and the farm ultimately charges an admission fee to the farm grounds during September – October. Nevertheless, Hickory Nut Gap Farm has incorporated year-round agritourism elements that provide visitors with an authentic farm experience. A complete guide to agritourism activities provided at Hickory Nut Gap Farm include:
<table>
<thead>
<tr>
<th>Agritourism Program Element</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer</td>
</tr>
<tr>
<td>Admission Fees</td>
<td>Free</td>
</tr>
<tr>
<td>Barn Dances</td>
<td>Friday Evening $5</td>
</tr>
<tr>
<td>Camps</td>
<td>Horse and art camps</td>
</tr>
<tr>
<td>Corn Mazes</td>
<td></td>
</tr>
<tr>
<td>CSA (Community Supported Ag.)</td>
<td>Meat CSA program. Members enroll in a 6 month supply of various farm meats &amp; quantities.</td>
</tr>
<tr>
<td>Educational/Field Trips</td>
<td>$100 minimum. $5 per student for groups. 1-hour guided tour activities.</td>
</tr>
<tr>
<td>Gift Store</td>
<td>Open 7 days a week from 9 am - 6 pm</td>
</tr>
<tr>
<td>Hay Wagon Rides</td>
<td>Group option $50</td>
</tr>
<tr>
<td>“How-to” Classes and Workshops</td>
<td>$55/class</td>
</tr>
<tr>
<td>Live Music</td>
<td>Friday evening $5</td>
</tr>
<tr>
<td>Livestock Production</td>
<td>One of the most popular &amp; profitable endeavors. Meats are sold on the farm &amp; to local restaurants.</td>
</tr>
<tr>
<td>Nature Walks</td>
<td></td>
</tr>
<tr>
<td>On-Farm Dinners/Restaurants</td>
<td>On-farm butchery, brunch, lunch, dinners, and catering for all types of events.</td>
</tr>
<tr>
<td>Orchards and Pick-Your Own Plots</td>
<td>Blueberries  Raspberries  Apples</td>
</tr>
<tr>
<td>Petting Zoo</td>
<td>Chickens  Pigs, goats and calves  Hogs</td>
</tr>
<tr>
<td>Pony and Horseback Riding</td>
<td>$7. Group Option $75</td>
</tr>
<tr>
<td>Special Event, Wedding and Venue Rentals</td>
<td>$100-$150 per 2 hrs.  $200-$250 per 2 hrs.</td>
</tr>
</tbody>
</table>

Figure 36: Hickory Nut Gap Farm: Agritourism Operations
As illustrated in Figure 36, Hickory Nut Gap Farm has a robust agritourism program. Outside of the farm’s popular livestock production and meat sales, Hickory Nut Gap Farm also offers numerous educational attractions. For children there are several summer camps, which include horse and art camps. Year-round the farm is open to hosting field trips, and a guided tour is tailored to coincide with the class’ curriculum. Nature walks are also found at Hickory Nut Gap Farm, and allow visitors to experience the native flora and fauna of North Carolina’s mountain region. Furthermore, the most popular educational activities are the “how-to” classes and workshops. These hands-on classes are primarily geared for adults, and range from candle making to cooking/baking lessons. The farm’s kitchen and large barn area serve as the classroom for a majority of these “how-to” seminars. Infrastructure at Hickory Nut Gap Farm is flexible in design, and thus can play host to a variety of programming and agritourism activities.
A farm that has and/or wants to have a robust agritourism program must also have the necessary infrastructure in order for these activities to come to fruition. Having a master plan is important, and Figure 37 is an in-depth look at Hickory Nut Gap Farm’s land-use and planned agritourism. In an earlier inventory it was noted that Hickory Nut Gap Farm was a unique situation due to Sugar Hollow Road dividing the agritourism business. This obstacle has forced Hickory Nut Gap Farm to group like attractions to either side of the road. The farm has kept seasonal attractions to the north of Sugar Hollow Rd., and more year-round draws to the south. Site buildings are almost predominately to the south of Sugar Hollow Rd., and they are all within close proximity to one another. Attractions, such as the animal barn, farm store, and butchery, are situated adjacent to the main entrance. These structures are all a form of roadside advertisement that helps pull in visitors. The fact that visitors are able to quickly pull off the road in order grab fresh seasonal meats and produce is very convenient. Larger attractions, such as the corn maze, you-pick plots, rotational livestock paddocks, and recreational areas all require more room, and therefore are situated towards the back of house. Overall, Hickory Nut Gap Farm has the space to spread agritourism operations out, yet they choose to keep things within a few hundred feet of one another. This has allowed visitors to experience a lot in a small area. Figure 38 notes the approximate square footage and acreage of some of those agritourism operations at Hickory Nut Gap Farm. By understanding how much room an agritourism activity requires, farmers and landscape architects can better prepare their program and master plan.
<table>
<thead>
<tr>
<th>Agritourism Program Element</th>
<th>Space Occupied (All takeoffs, sf and acreage is approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Gift Store/Butchery</td>
<td>1,710 sf</td>
</tr>
<tr>
<td>Big Barn (Event Space)</td>
<td>10,465 sf (~10 sf/person = 1,047 person maximum guest list)</td>
</tr>
<tr>
<td>Corn Maze</td>
<td>222,440 sf or 5.1 acres</td>
</tr>
<tr>
<td>Livestock Production &amp; Paddocks</td>
<td>Average 217,350 or 5 acres per pad.</td>
</tr>
<tr>
<td>Parking</td>
<td>100 spots (based on a typical 10’ x 20’ parking stall)</td>
</tr>
<tr>
<td>Party Shed</td>
<td>1,000 sf (100 person maximum guest list ~10 sf/person)</td>
</tr>
<tr>
<td>Petting Zoo / Corral Area</td>
<td>4,500 sf</td>
</tr>
<tr>
<td>Pick-Your-Own Plots</td>
<td>108,000 sf or 2.48 acres</td>
</tr>
<tr>
<td>Recreation Stations</td>
<td>625 sf average per attraction</td>
</tr>
</tbody>
</table>

*Figure 38: Hickory Nut Gap Farm: Spaced Occupied By Agritourism Elements*
The following images reflect the primary design features, buildings, and other infrastructure at Hickory Nut Gap Farm. Each figure has been analyzed to convey key design principles and materiality. As depicted, infrastructure at Hickory Nut Gap Farm has been erected in the same architectural style. Aesthetic uniformity among the various barns, buildings, and infrastructure gives Hickory Nut Gap Farm a professional and harmonious look. This is particularly important given that the buildings are within close proximity to one another, and are readily seen from the road/visitor parking lot. As observed in Figure 39 and Figure 41, Hickory Nut Gap Farm has left a large historical silo in tact. Whenever historical infrastructure can be utilized in a design there is a story told. Historic preservation on farms gives insight on how the land was once tended. In Hickory Nut Gap Farm’s instance, the silo was once used for livestock feed, but nowadays the piece of history serves as a wayfinding beacon. This silo helps orient visitors to the farm’s entrance. Figure 42 also shows a recreation station situated adjacent to the farm’s main pathway. Recreational infrastructure, like the play-web shown, is an agritourism attraction for children, and a means of strenuous activity.
Figure 39: Hickory Nut Gap Farm: Farm Entrance

Figure 40: Hickory Nut Gap Farm: Farm Store
Figure 41: Hickory Nut Gap Farm: The Big Barn Event Space

Figure 42: Hickory Nut Gap Farm: Recreational Infrastructure
Though a majority of Hickory Nut Gap Farm’s agritourism endeavors have been successful there are also areas that Hickory Nut Gap Farm lacks altogether or has not been as successful with. A list of successful and unsuccessful agritourism endeavors include:

<table>
<thead>
<tr>
<th>Successful</th>
<th>Unsuccessful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agritourism and recreational opportunities for all ages</td>
<td>Limited you-pick opportunities (Summer and Fall only)</td>
</tr>
<tr>
<td>Historical preservation</td>
<td>Venues are great for a variety of events, but not ideal for weddings</td>
</tr>
<tr>
<td>Educational opportunities via field trips, workshops, and nature walks</td>
<td>No overnight accommodations on the farm. Guests wanting to stay nearby are encouraged to book a room at the historic Old Sherrill’s Inn. This is also a recommended venue for weddings.</td>
</tr>
<tr>
<td>Meat and produce production and sales</td>
<td></td>
</tr>
<tr>
<td>Farm layout and optimizing use of all farm commodities</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 43: Hickory Nut Gap Farm: Successful and Unsuccessful Implementations*

In summary, Hickory Nut Gap Farm benefits the most from livestock and produce production. Whether purchases come from the on-farm storefront, online, or via a community supported agriculture program, Hickory Nut Gap Farm has set up the necessary infrastructure to meet supply and demand. Providing some sort of winter and/or spring you-pick produce is something to consider, and the farm’s lack of overnight accommodations limits venue opportunities.
Mike’s Farm is the second case study examined, and was chosen due to its moderate size, historical background, and location. The farm is located in Beulaville, North Carolina, which is in the coastal plain region of the state. In addition, Mike’s Farm is close in both size and geographic location to the site of the projected design (Twiddle Dee Farm) discussed later in Chapter 5. The history of Mike’s Farm dates back to 1945 when the farm was first purchased and operated as a tobacco farm. As the case for numerous small North Carolina family farms, the children who grew up on the land here got older and ventured off the farm and into the public sector for work. Nevertheless, in the mid-1980’s Mike Lowe and his wife, Theresa, once again began tending the land that Mike grew up on. This time, however, Christmas trees were the “cash crop” of choice. As years progressed the farm started to diversify its business practices, and as a result some of the first infrastructure implemented was a small gift shop. Nowadays the gift shop has expanded in size and also serves as a bakery. Most recently the farm has incorporated a restaurant that offers slow cooked on-farm meals.
Figure 45: Mike’s Farm: Context Map (Map Base: www.googlemaps.com)
Mike’s Farm is comprised of 9 parcels that make up approximately 91 acres. Of the 91 acres there are 11 outlying acres separated from the other parcels by Luther Banks Road. A similar condition was observed at Hickory Nut Gap Farm, and ultimately when a roadway separates an agritourism operation it can become a liability. Unlike Hickory Nut Gap Farm, Mike’s Farm decided to keep public operations limited to one side of the road. In addition, by positioning the primary agritourism activities adjacent to the intersection of Luther Banks Rd. and Haw Branch Rd. visitors can easily locate and access the farm.

Figure 47 illustrates further disruptions by roadway infrastructure, and highlights the dissected network of natural ecosystems that surround Mike’s Farm. Adjacent to the southwest side of the farm’s 89-acre parcels is a woodland creek and primary ecological
corridor. A sizeable portion of Mike’s Farm itself lies within a smaller, secondary corridor, yet this canopied passageway is broken up by the intersection of Luther Banks and Haw Branch roads. Preserving ecological corridors are important for nature to coexist adjacent to man. Wildlife is an attraction for most farm visitors, and whether intentional or not, Mike’s Farm has done a good job of preserving canopy coverage. As noted previously, the farm has grouped its agritourism operations, and as a result minimalized their ecological footprint.

Figure 47: Mike’s Farm: Ecological Corridor Study
Figure 48: Mike’s Farm: Program Layout (Images Source: www.mikesfarm.com, 2017) (Map Source: www.bing.com/maps, 2017)
Figure 48 takes a closer look at Mike’s Farm’s compact layout. Most of the agritourism operations are within 34 contiguous acres, and the farm’s main entrance is off of Luther Banks Road. As visitors first arrive the farm’s petting zoo goats greet them along the entrance drive path. Primary parking is front and center, and immediately adjacent to the farm’s bakery, gift shop, and restaurant. Though individual parking spaces are not delineated the primary parking lot can comfortably fit 34 cars. Handicap parking is the exception, and is clearly marked with signage. In the event of a major seasonal attraction the farm does have spillover parking, in which an additional 134 vehicles can be accommodated. The farm store and restaurant buildings serve as an unofficial welcome and introduction center. As seen, most of the activities are situated around these two buildings. Having a farm store centrally located like this allows visitors to quickly access restrooms and/or take a relaxing break. The farm’s two event spaces, and particularly the large barn venue, are outliers and located away from the farm’s hub of attraction. This creates a sense of seclusion, and venues are nestled closer with nature. Lastly, the strawberry you-pick plots are located along the property line, and adjacent to Haw Branch Road. At Mike’s Farm the strawberry you-pick plots are roadside advertisement for the farm, and invite those passing by to stop and pick. The strawberry you-pick plots are roughly 3.8 acres total, which is the greatest amount of land needed for an agritourism attraction at Mike’s Farm.

Though agritourism operations only take up a small portion of the overall farm acreage, Mike’s Farm relies heavily on those means as a source of income. Their primary farming practices include you-pick plots of strawberries, pumpkins, and Christmas trees. Additional agritourism operations and their respective seasonal interest include:
### MIKE’S FARM AGRITOURISM SEASONAL PROGRAM

<table>
<thead>
<tr>
<th>Agritourism Program Element</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer</td>
</tr>
<tr>
<td>Admission Fees</td>
<td>General admission is free year round</td>
</tr>
<tr>
<td>Bakery</td>
<td>Fudge, cakes, pie, pastries, and cookies</td>
</tr>
<tr>
<td>Gift Store</td>
<td>Majority of the year open Thurs.-Sat. (12:00-8:00)</td>
</tr>
<tr>
<td>Hay Wagon Rides</td>
<td>$2</td>
</tr>
<tr>
<td>Historical Displays or Events</td>
<td>Antique show</td>
</tr>
<tr>
<td>Live Music and Shows</td>
<td>Live music and shows often accommodate on-farm dinners at the restaurant</td>
</tr>
<tr>
<td>On-Farm Dinners/Restaurants</td>
<td>Year-round farm style dinners</td>
</tr>
<tr>
<td></td>
<td>Adults: $15.49, Ages 7-11: $8.49, Ages 3-6: $5.49</td>
</tr>
<tr>
<td>Orchards and Pick-Your Own Plots</td>
<td>Strawberries, Pumpkins</td>
</tr>
<tr>
<td>Petting Zoo</td>
<td>Rabbits, chickens, peacocks, ducks, turkeys, sheep, goats, and donkeys</td>
</tr>
<tr>
<td>Seasonal Attractions</td>
<td>Major holiday attractions include Christmas, Valentines, and Easter</td>
</tr>
<tr>
<td>Special Event, Wedding and Venue Rentals</td>
<td>Barn $2500/day, Banquet Room $500/day</td>
</tr>
</tbody>
</table>

*Figure 49: Mike’s Farm: Agritourism Operations*

As shown, Mike’s Farm has a diversity of attractions that appeal to visitors of all ages and times of the year. The busiest agritourism seasons on the farm are summer and fall, and with the numerous operations there is a need for various sized and programmed infrastructure. As highlighted above in Figure 46, Mike’s Farm’s major infrastructure
includes a gift shop and bakery, a restaurant, and event venues such as the barn and banquet room. The gift shop and bakery is an estimated 6,786 sf, and is a place where visitors can purchase various on-farm and off-farm commodities. The farm’s restaurant building is roughly 15,712 sf and serves up family style meals. The barn is primarily used as a large wedding and event venue, and the 2,116 sf allow for a guest list of up to 200. During peak season, the barn rents out for $2500/day. Lastly, the banquet room is used as a venue for smaller weddings and events. It has approximately 864 sf and typically supports between a 50 and 100-person guest list. The banquet room may be rented out for $550. Optional venue spaces is important to note because it gives potential clients the choice to pick what is most suitable for their event. A chart summarizing the square footage and acreage of all of Mike’s Farm’s various agritourism commodities can be seen in Figure 50.
The following figures highlight some of the major infrastructure, and offer an analysis of design intent and materiality.
Figure 51: Mike’s Farm: The Barn Venue (www.mikesfarm.com, n.d.)

Figure 52: Mike’s Farm: Gift Shop (www.mikesfarm.com, n.d.)
As seen from the various infrastructure figures above, materiality is consistent throughout. ADA accessible pathways, ample lighting, and well-crafted wood structures contribute to an effective overall design.

Interview guide questions were also sent to Mike’s Farm. Mike and Theresa Lowe’s responses, Figure 54, offer insight on what has been successful and problematic on their agritourism farm.
MIKE’S FARM
INTERVIEW GUIDE QUESTIONS

1) Has your farm been in your family for multiple generations? If so, how long has your farm been a family owned & operated endeavor?

Yes, it has been family owned and operated since 1945.

2) What have historically been the primary farming practices on your land?

Tobacco, Christmas Trees, Strawberries, and Pumpkins

3) What are the primary farming practices operated on your farm today?

Strawberries, Pumpkins, and Christmas Trees

4) Is agritourism a part of your farm’s business strategy? If so, what forms of agritourism does your farm offer?

Yes, we offer strawberry picking, pumpkin picking, school field trips, and hayrides. We also own a family style restaurant, bakery & gift shop. We do dinner shows as well as offer weddings.

5) What season(s)/month(s) does your farm offer agritourism activities?

Year round, however, most popular months are May, October, and December.

6) What farming operations have been the most popular/profitable?

Pumpkins & Christmas Trees

7) What farming operations have been the most work and difficult to implement? What has made those operations difficult?

Strawberries are the most work. Weather conditions can affect strawberries more than any other operation making the season and profitability more uncertain. Disease and pests are also a major factor in growing strawberries that have to be monitored more closely than other operations we have here.

8) If anything, what would you do different if given the chance to do it all over again?

I would have increased the size of everything to begin with. Expecting growth potential & hoping for the best.

9) What advice would you offer other NC farmers looking to implement agritourism activities as an alternative/additional form of business methodology?

I feel many farms try to be an agritourism farm, yet fail to realize how important presentation is. I have seen many farms add new attractions & they have no visual appeal. Most of these times in our observation these farms suffer or are short lived. While many farm add kid attractions, which is certainly a draw, it also needs to appeal to adults as well.

Figure 54: Mike’s Farm: Responses to Interview Guide Questions (responses in red)
As advised by Mike and Theresa Lowe, presentation is of high importance for an agritourism operation. Farm owners should ensure that a visitor’s first impression is inspiring. *Figure 55* is a photo taken from Mike’s Farm’s parking lot, and is a visual capture of the first thing visitors see upon arrival. The farm’s entrance is an example of well thought-out presentation, and numerous features contribute to a welcoming first impression.

*Figure 55: Mike’s Farm: Main Entrance (www.mikesfarm.com, n.d.)*
The successful and unsuccessful features of Mike’s Farm based on the evaluation of design and programming are as follows:

![MIKE’S FARM SUCCESSFUL AND UNSUCCESSFUL IMPLEMENTATIONS](image)

**Figure 56: Mike’s Farm: Successful and Unsuccessful Implementations**

In summary, Mike’s Farm has had a magnitude of success based on year-round interest and professional aesthetics. What the farm offers is well done, and they have a high number of repeat visitors. Clientele revisits Mike’s Farm because of its seasonal diversity, and those repeat customers are able to have an entirely different farm experience depending on the time of year. Additional success comes from the rentable venues...
offered by the farm. Customers have a choice between various sized event spaces, which allows renters to select an option that better suits their needs.

Like all farms, Mike’s Farm does have some unsuccessful elements noted. Infrastructure sizing was a point of emphasis made by Mike and Theresa Lowe in their response to the Interview Guide Questions. Mike’s Farm did not fully consider the farm’s potential growth and, though the infrastructure is diverse, it is not large enough to successfully accommodate the amount of visitors. On the backside of the farm there is a sizeable wildlife corridor that is not being taken advantage of. As noted previously in Chapter 3, Figure 23, experiencing nature is one of the main reasons one may visit an agritourism farm. Not all farms have the natural resources that are present on Mike’s Farm, and thus this is a potential agritourism opportunity. Woodland trails give visitors a chance to get closer to nature, and they can be designed in such a manner as to have a minimum ecological footprint (i.e. permeable/organic material for the path). Nature trails can also be looked at as an educational (i.e. a native plant walk with informative signage) and/or recreational (i.e. jogging and horseback riding) opportunity as well.
The third precedent is Fickle Creek Farm, which is located in Efland, North Carolina. The farm is comprised of six isolated parcels (12.79 acres, 19.92 acres, 1.44 acres, 70.83 acres, 60.95 acres, and 4.94 acres respectively) that total approximately 171 acres. For the sake of our precedent study, only the 60.95-acre tract will be analyzed since it is the primary means of daily operation and agritourism. Fickle Creek Farm does not offer as many agritourism activities as the two previous case studies examined. Yet, the farm was chosen in order to better understand sustainable farming practices, and ultimately how a more traditional farm (one that is not dominated in agritourism programming) decides which agritourism business strategies best compliment the farm's daily working operations.
Figure 58: Fickle Creek Farm: Context Map (Map Base: www.googlemaps.com)
Fickle Creek Farm is located within the piedmont region of North Carolina. The farm sits in close proximity (~25 miles) to Greensboro, NC, Chapel Hill, NC, Durham, NC, and Raleigh, NC. All four of these cities have a large population greater than 100,000 people. In addition, there are several major universities within the 25-35 mile radius. (UNC Greensboro, NC A&T, UNC Chapel Hill, Central University, Shaw University, Duke University, and North Carolina State University). Fickle Creek Farm is also located within proximity to highway I40, which is the state’s most used highway when travelling east/west.
Figure 59: Fickle Creek Farm: Program Layout (Map Source: www.googlemaps.com, 2017)
Figure 59 is an overall master plan of Fickle Creek Farm. The farm prides itself on being a good steward of the land by using best management practices to promote conservation, nutrient cycling, permaculture, and native plants. Towards the western edge of the property there is a man-made farm pond. The pond is used to collect stormwater, and as a result help prevent erosion and animal waste runoff in the surrounding woodlands and natural watersheds.

As depicted, the farm has numerous rotational livestock paddocks, which allows the farm owners to sequentially interchange grazing livestock between pastures. Benefits of rotational paddocks include:

• Rotational pastures have been found to more efficiently utilize forage resources. In other words, livestock consume more of the forage produced, and therefore there is less waste.
• Rotational paddocks optimize the growth rate of forage. Pasturelands and grazing plants have three stages: vegetative phase, rapid vegetative phase, and reproductive phase where plant growth tops out. Farmers want to start and stop livestock grazing during the rapid vegetative growth stage so that the forage is constantly in a state of rapid growth.
• Higher stocking rates.
• Farmers can harvest and feed less hay during the late fall and winter. Hay is an extremely inefficient product to harvest, store, and then distribute. A significant portion (30-70%) of the hay is lost between the time of harvest and feeding.
• Prevents overgrazing, which in turn prevents root dieback and ultimately saves the pasture’s stand of forage.
• More efficient weed suppression and enhanced desirable forage material.

*(Why Rotate Pastures? Johnston, 2013)*

Fickle Creek Farm has numerous rotational livestock paddocks within close proximity to one another, and there are even several paddocks located within a utility easement. The farm generally rotates cattle, followed by sheep, and lastly chickens. Pastures at Fickle Creek Farm vary in size, however the average paddock size is 66,000 sf (1.5 acres).

*Figure 60, Fickle Creek Farm: Space Occupied By Agritourism Operations,* notes the average square footage for various program elements at Fickle Creek Farm. *Figure 61, Suggested Space and Housing Guidelines for Fully Mature Farm Animals,* outlines the number of livestock animals that are recommended per acre of land.

**FICKLE CREEK FARM - SPACE OCCUPIED BY AGRITOURISM ELEMENTS**

<table>
<thead>
<tr>
<th>Agritourism Program Element</th>
<th>Space Occupied (All takeoffs, sf and acreage is approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenhouse</td>
<td>2,310 sf</td>
</tr>
<tr>
<td>Farm Pond</td>
<td>43,860 sf or 1.00 acres</td>
</tr>
<tr>
<td>Farm Stay</td>
<td>2 bedrooms and 1 bathroom</td>
</tr>
<tr>
<td>Large Barn</td>
<td>3,700 sf</td>
</tr>
<tr>
<td>Livestock Production &amp; Paddocks</td>
<td>Average 66,000 sf or 1.5 acres</td>
</tr>
<tr>
<td>Vegetable Plot</td>
<td>23,980 sf or 0.55 acres</td>
</tr>
</tbody>
</table>

*Figure 60: Fickle Creek Farm: Space Occupied By Agritourism Operations*
<table>
<thead>
<tr>
<th>Animal</th>
<th>Horse</th>
<th>Beef Cow</th>
<th>Dairy Cow</th>
<th>Dairy Goat</th>
<th>Pig</th>
<th>Sheep</th>
<th>Hen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
<td>1 horse</td>
<td>1 cow</td>
<td>1 cow</td>
<td>1 goat</td>
<td>1 pig</td>
<td>1 sheep</td>
<td>1 hen</td>
</tr>
</tbody>
</table>
| Enclosed Housing Area/Animal | - Tie stalls 45 sq. ft.; 5' x 9'  
- Box stall 12' x 8' or 10' by 10' | 75-100 sq. ft. | 75-100 sq. ft. | 20-25 sq. ft. | 48 sq. ft. with exercise yard; 100 sq. ft. without exercise yard | 20-25 sq. ft. | 3-4 sq. ft. |
| Exercise Yard Area/Animal | 200 sq. ft.                          | 100-125 sq. ft.         | 100-125 sq. ft.          | 50 sq. ft.             | 200 sq. ft.                         | 50 sq. ft.             | 10 sq. ft.          |
| Pasture Area/Animal | 1-2 acres                              | 1-2 acres              | 1-2 acres              | 0.2-0.3 acres           | 12-14 sows/acre/rotational pasture | 0.2-0.3 acres           | ---------           |
| Type of Housing and Boundary Setback | Enclosed ventilated barn or open 3-sided barn  
Setback 50 ft. | Open front 3-sided barn  
Setback 50 ft. | Open front 3-sided barn, free-stall or enclosed stanchion barn  
Setback 50 ft. | Enclosed barn with removable side panels or windows  
Setback 50 ft. | Enclosed barn, huts, shed, hutches or lean-to  
Setback 50 ft. | Open front 3-sided shed  
Setback 50 ft. | Enclosed barn  
Setback 50 ft. |
| Fencing         | Electric Wooden rail  
Woven wire | Barbed wire  
Electric Woven wire | Barbed wire  
Electric Woven wire | Electric Woven wire | Electric Plank rail  
Woven wire | Electric Woven wire | Chicken wire |
Figure 62: Fickle Creek Farm: Agritourism Operations

As shown in Figure 62, Fickle Creek Farm’s agritourism operations are very limited, and for the most part do not encourage influxes of daily visitors to the farm. Like Hickory Nut Gap Farm, Fickle Creek Farm participates in a community supported agriculture (CSA) program. This is an ideal business practice for working farms, because it allows consumers to purchase directly from the farmer. This is an efficient way for a farm to generate income without having to continually host visitors on the farm. Fickle Creek Farm also concentrates heavily on educational farm tours. Visitors to Fickle Creek Farm are able to experience and learn the daily operations of a working, sustainable farm.

Previous research recalls (How Important Were Each of the Following Reasons for
Making the Visit to the Farm?, Figure 23) that an authentic farm experience is the sixth most important reason visitors partake in an outing to a farm. Fickle Creek Farm charges $8/person for their farm outings, and some of the major tours that Fickle Creek Farm participates in include:

- Piedmont Farm Tour: Coordinated by The Carolina Farm Stewardship Association, the Piedmont Farm Tour is an annual event that showcases more than 30 farms in the Orange, Chatham, Alamance, and Caswell Counties. This farm tour typically takes place during the third weekend of April.

- Tours for Children: Fickle Creek Farm has hosted a variety of tours for children, such as the C’est si Bon Cooking School (a cook class that offers a kid chefs course, which empowers children with culinary skills and knowledge), local youth groups, and others.

- Tours for 4-H and FFA: Again, Fickle Creek has worked closely with children, and offered farm visits to those extracurricular youth programs that focus on agriculture.

- University/College Tours: Fickle Creek Farm has worked hand in hand with various higher education classes to allow students to learn about proper environmental stewardship and humane practices with livestock. Some of those university classes to have visited the farm include North Carolina State University’s School of Veterinary Medicine, and Duke-Nicholas School for the Environment.

(www.ficklecreekfarm.com, n.d.)
Fickle Creek Farm offers farm stay accommodations, which ultimately is the only agritourism attraction that a visitor can partake in whatever day they want. Farm stays are agritourism programs that allow visitors to vacation in a rural setting. As noted previously, today’s urbanites are searching for a means to reconnect with rural agriculture, and ultimately escape the city life. As a result, farm stays are a growing trend in agritourism programming. The farm stay at Fickle Creek is centrally located and adjacent to daily farm operations. Visitors are only steps away from farm fresh produce and meats, and can expect a full kitchen, shower, two beds, and a large deck. Prices for the farm stay vary, however it is generally $85 per night plus a $65 cleaning fee. The farm stay is hosted on Air BnB (www.airbnb.com), which is a valuable source for any farmer looking to advertise their rural abode.

<table>
<thead>
<tr>
<th>FICKLE CREEK SUCCESSFUL AND UNSUCCESSFUL IMPLEMENTATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Successful</strong></td>
</tr>
<tr>
<td>Rotational livestock paddocks</td>
</tr>
<tr>
<td>Working farm, however still offers farm tours to the general public.</td>
</tr>
<tr>
<td>Take full advantage of Community Supported Agriculture Programs</td>
</tr>
<tr>
<td>Offer farm stay accommodations</td>
</tr>
</tbody>
</table>

*Figure 63: Fickle Creek Farm: Successful and Unsuccessful Implementations*
Fickle Creek Farm is a good example of traditional farming operations with minor agritourism attractions. Fickle Creek Farm has prioritized certain agritourism operations that suit their farm best, and thus take advantage of a more passive agritourism program. The farm is limited to the general public, yet still capitalizes on public interest in the farm via farm tours and community supported agriculture programs. The farm is not designed to handle the daily impact of mass visitors, and will ultimately need to develop better wayfinding and parking if it plans to expand its agritourism operations.
The fourth, and last, case study is Greenlands Farm. Greenlands Farm is located in Bolivia, North Carolina, and at approximately 15.86 acres it is the smallest design precedent examined. The farm is a third generation farm and nowadays is owned and operated by Henry and Heather Burkert. This farm is of particular interest because of its close proximity to numerous beaches, which attract vacationing tourists. As illustrated in Figure 65, Greenlands Farm is situated within ~25 miles of Wilmington, NC (116,000 population – city limits), and Myrtle Beach, SC. (270,000 population – metro area). Both of these cities have a large population, yet they are also major tourist destinations. Greenlands Farm serves as a good case study for those farms looking to potentially attract vacationers and/or a more transient clientele.
Figure 65: Greenlands Farm: Context Map (Map Base: www.googlemaps.com)
Figure 66: Greenlands Farm: Program Layout (Images Source: www.greenlandsfarm.org, 2017) (Map Source: www.bing.com/maps, 2017)
Figure 66 is the overall layout of Greenlands Farm. As one approaches Greenlands Farm a large entrance sign, immediately adjacent to the roadway, greets them. Similar to Hickory Nut Gap Farm’s silo, this roadside signage serves as a wayfinding marker, and ultimately is an advantageous advertisement that highlights some of Greenlands Farm's seasonal goods. The farm's parking lot is immediately adjacent to the entrance sign, and thus easily accessible from the road. The parking lot is compact in size, unpaved, and its informal layout accommodates roughly 25 vehicles. As the case with all three previously examined farm precedents, Greenlands Farm also has a brick and mortar store within close proximity to the farm’s primary entrance. The farm store is large, and the building’s iconic form quickly draws the attention guests. Visitors must pass by the store on the way in and out, and thus the storefront ultimately serves as an unofficial gateway to the rest of the farm’s agritourism operations. This allows the owners to more readily control access on their farm.
**Figure 67: Greenlands Farm: Agritourism Operations**

Figure 67 explores all of the agritourism operations offered at Greenlands Farm, and it is interesting to note that the farm is primarily geared for the public during the spring, summer, and fall. The farm store and most agritourism endeavors close during late December and do not reopen until April. Though, Greenlands Farm does offer how-to classes, and cooking/baking lessons during the winter months. Greenlands Farm’s infrastructure is not as robust as Hickory Nut Gap Farm or Mike’s Farm, yet as previously

<table>
<thead>
<tr>
<th>Agritourism Program Element</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer</td>
</tr>
<tr>
<td>Admission Fees</td>
<td>Farm is open year-round, yet the farm store operates on seasonal hours. No gen. admiss. fee</td>
</tr>
<tr>
<td>CSA (Community Supported Ag.)</td>
<td>$325/10 wks Veggies</td>
</tr>
<tr>
<td>Educational/Field Trips</td>
<td></td>
</tr>
<tr>
<td>Gift Store/Farm Store</td>
<td>Friday &amp; Saturday 8:30 - 5:30</td>
</tr>
<tr>
<td>“How-to” Classes and Workshops</td>
<td>Sketching classes, cooking/baking lessons</td>
</tr>
<tr>
<td>Live Music</td>
<td>Folk music festival</td>
</tr>
<tr>
<td>Nature Walks</td>
<td>Via a guided tour</td>
</tr>
<tr>
<td>On-Farm Dinners/Restaurants</td>
<td>Tapas &amp; tours $45</td>
</tr>
<tr>
<td>Petting Zoo</td>
<td></td>
</tr>
<tr>
<td>Venue Rentals/Birthday Parties</td>
<td>Birthday parties</td>
</tr>
</tbody>
</table>
noted it does have a large brick and mortar store. The store is only open Friday and Saturday evenings, which is when most people are visiting the farm. The farm store also concentrates only on selling goods grown or made at Greenlands Farm, and thus the items offered are constantly in flux depending on the season. *Figure 68* is an image of Greenlands Farm’s storefront.

![Figure 68: Greenlands Farm: Farm Store & Bakery (www.greenlandsfarm.org, 2017)](image)

As analyzed, the farm store is large enough to accommodate a variety of programs, and like Mike’s Farm, the store is also a bakery. The barn’s porch faces the primary parking lot and helps visitors delineate where the store’s main entrance is located.

Other agritourism activities offered at Greenlands Farm include farm tours, live music, a petting zoo, weddings/birthday parties, and educational workshops. As with all
the case studies looked at, educational opportunities are important draws to the farm. Volunteers are encouraged to spend time on the farm giving help in a variety of ways, and in return gaining professional experience on a sustainable farm. Typically once or twice a month there will be informative workshops offered to the public. These classes are geared for both adults and children, and instruct attendees on animal husbandry, sustainable farming practices, and cooking among other lessons. Curriculum-guided tours for school groups and the general public are another means of educational agritourism. During guided tours sustainability is a primary subject, and visitors learn how Greenlands Farm handles stormwater via low impact development (LID) principles.

Figure 69: Greenlands Farm: Primary Circulation Pathway and Nature Trail (www.greenlandsfarm.org, 2017)
Similar to Hickory Nut Gap Farm, Greenlands Farm also takes advantage of a community supported agriculture (CSA) program. In particular, Greenlands Farm has two CSA seasons in which consumers can purchase directly from the farmer. *Figure 70* examines the amount of space allocated to the CSA vegetable plots and other agritourism infrastructure at Greenlands Farm.

### Greenlands Farm - Space Occupied by Agritourism Elements

<table>
<thead>
<tr>
<th>Agritourism Program Element</th>
<th>Space Occupied (All takeoffs, sf and acreage is approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakery and Farm Gift Store</td>
<td>2,418 sf</td>
</tr>
<tr>
<td>CSA Vegetable Plots</td>
<td>34,000 sf or 0.80 acres</td>
</tr>
<tr>
<td>Livestock Barn</td>
<td>1,520 sf</td>
</tr>
<tr>
<td>Livestock Paddocks</td>
<td>113,600 sf or 2.6 acres</td>
</tr>
<tr>
<td>Parking</td>
<td>25 spots (based on a typical 10’ x 20’ parking stall)</td>
</tr>
</tbody>
</table>

*Figure 70: Greenlands Farm: Spaced Occupied By Agritourism Elements*

Greenlands Farm’s acreage is small, though its infrastructure allocates the necessary space for each agritourism operation to succeed. The gift store is large, which gives the farm flexibility when it comes to programming the building. The store also serves as a bakery, and a place where workshops are held. The vegetable plots are not huge, but yield enough harvest to provide for two CSA signup seasons. The livestock barn and
paddock is shelter and forage to numerous rescue animals such as donkeys, horses, pigs, goats, rabbits, and chickens.

In conclusion, Greenlands Farm is a successful small-scale agritourism operation. The farm has long-range and short-range agritourism trajectory, which supports everyday clientele and transient clientele. Locals to the area can enjoy Greenlands Farm by taking advantage of the numerous educational workshops, and by participating in the CSA endeavors. On the other hand, those who are only vacationing in the area can stop by Greenlands Farm to grab a baked good or visit the petting zoo. Figure 71 takes a further look at the successful and unsuccessful program elements of Greenlands Farm.
## GREENLANDS - SUCCESSFUL & UNSUCCESSFUL IMPLEMENTATIONS

<table>
<thead>
<tr>
<th>Successful</th>
<th>Unsuccessful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large farm store &amp; bakery sells farm commodities. Online store sales too.</td>
<td>Limited venue rental opportunities</td>
</tr>
<tr>
<td>CSA opportunities (twice a year - spring and fall vegetables)</td>
<td>Minimum agritourism operations on weekdays</td>
</tr>
<tr>
<td>Educational opportunities via field trips, workshops, and volunteering</td>
<td>Lack of winter interest on the farm</td>
</tr>
<tr>
<td>Roadside advertisement via signage</td>
<td>Lack of strenuous recreational activity</td>
</tr>
<tr>
<td>Petting zoo and rescue animals</td>
<td>Group tours are encouraged, individual tours are not recommended, which make it hard to visit and walk around on one’s own time.</td>
</tr>
<tr>
<td>Low Impact Design (LID) via storm-water collection</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 71: Greenlands Farm: Successful and Unsuccessful Implementations*
Comparing and Contrasting Farm Case Studies

**Figure 72: Case Studies – Comparing & Contrasting Farm Admission**

<table>
<thead>
<tr>
<th>Agritourism Farm</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer</td>
</tr>
<tr>
<td>Fickle Creek Farm</td>
<td></td>
</tr>
<tr>
<td>In general Fickle Creek is not open to the public. Open via tours only - $8/person per tour.</td>
<td>Free</td>
</tr>
<tr>
<td>Greenlands Farm</td>
<td></td>
</tr>
<tr>
<td>General Hours of Operation:</td>
<td></td>
</tr>
<tr>
<td>8:30 am - 5:30 pm</td>
<td>Free</td>
</tr>
<tr>
<td>Hickory Nut Gap Farm</td>
<td></td>
</tr>
<tr>
<td>General Hours of Operation:</td>
<td></td>
</tr>
<tr>
<td>9:00 am - 6:00 pm</td>
<td>Free</td>
</tr>
<tr>
<td>Mike’s Farm</td>
<td></td>
</tr>
<tr>
<td>General Hours of Operation:</td>
<td></td>
</tr>
<tr>
<td>12:00 pm-8:00 pm</td>
<td>Free</td>
</tr>
</tbody>
</table>

As depicted in Figure 72, Greenlands Farm, Hickory Nut Gap Farm, and Mike’s Farm are open year round. Admission is typically free for these three agritourism farms, however during Fall, the peak agritourism season, Hickory Nut Gap Farm charges a $7/person admission fee. Fickle Creek Farm is the outlier of the case studies examined. Fickle Creek Farm has minor agritourism operations, yet takes advantage of an $8/person admission fee during the days it does offer farm tours.
Overall, the acreage of the four case studies examined varies greatly, yet there are similarities between their agritourism businesses strategies. This is important to note, and informs one that small farms are implementing the same agritourism operations as larger farms. *Figure 74* compares and contrasts those agritourism activities offered by the precedent farms researched in this chapter.
### Figure 74: Case Studies – Comparing & Contrasting Agritourism

<table>
<thead>
<tr>
<th>Agritourism Program Element</th>
<th>Fickle Creek Farm</th>
<th>Greenlands Farm</th>
<th>Hickory Nut Gap Farm</th>
<th>Mike’s Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barn Dances</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bed &amp; Breakfast/Farmstay</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birthday Parties</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camps</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn Mazes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSA (Community Supported Ag.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Field Trips</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm Store/Gift Store</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hay Wagon Rides</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical Infrastructure/Displays</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“How-to” Classes and Workshops</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live Music</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livestock Production</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature Walks/Native Plants</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-Farm Dinners/Restaur./Cafe</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pick-Your Own Plots/Orchards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petting Zoo</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pony and Horseback Riding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tours (General Public Farm Tours)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seasonal Attractions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Event, Wedding and Venue Rentals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Agritourism commonalities between three of the four farms include CSA (community supported agriculture), farm store/gift store, how-to classes and workshops, live music, nature walks/native plants, petting zoos, and tours. Educational field trips are the only agritourism endeavor offered by all four farms. It is inferred that these common agritourism operations are due to their profitability, popularity, and/or ease of implementation. Bed and breakfast/farm stays and barn dances were two agritourism activities found to only be offered by one of the four case studies. Though barn dances seem to be more of a niche activity, it is surprising that bed and breakfast/farm stays are not offered by more than one of the studied farms. The data can be somewhat deceiving, because overnight accommodations (Historic Sherrill’s Inn) is within close proximity to Hickory Nut Gap Farm. This may be the ultimate reason why Hickory Nut Gap Farm has not implemented a farm stay within their agritourism center.
### Case Studies - Comparing and Contrasting Infrastructure

<table>
<thead>
<tr>
<th>Agritourism Program Element</th>
<th>Fickle Creek Farm</th>
<th>Greenslands Farm</th>
<th>Hickory Nut Gap Farm</th>
<th>Mike’s Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bed &amp; Breakfast/Farm Stay</td>
<td>2 bd/1 bath</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Farm Store/Gift Store/Bakery</td>
<td>N/A</td>
<td>2,418 sf</td>
<td>1,710 sf</td>
<td>6,786 sf</td>
</tr>
<tr>
<td>Livestock/Storage Barns (average)</td>
<td>3,750 sf</td>
<td>1,520 sf</td>
<td>N/A</td>
<td>3,250 sf</td>
</tr>
<tr>
<td>Livestock Paddocks (average)</td>
<td>1.5 acres</td>
<td>2.6 acres</td>
<td>5.0 acres</td>
<td>N/A</td>
</tr>
<tr>
<td>On-Farm Dinners/Restaur./Cafe</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>15,712 sf</td>
</tr>
<tr>
<td>Organic produce/meats</td>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>Parking Stalls</td>
<td>N/A</td>
<td>25</td>
<td>100</td>
<td>Primary Parking - 34 Overflow Parking - 134</td>
</tr>
<tr>
<td>Petting Zoo</td>
<td>N/A</td>
<td>N/A</td>
<td>4,500 sf</td>
<td>528 sf/per</td>
</tr>
<tr>
<td>Pick-Your Own Plots/Orchards</td>
<td>N/A</td>
<td>N/A</td>
<td>2.48 acres</td>
<td>3.80 acres</td>
</tr>
<tr>
<td>Seasonal Attractions</td>
<td>N/A</td>
<td>N/A</td>
<td>Corn Maze 5.1 acres</td>
<td>Christmas Trees 1.5 acres</td>
</tr>
<tr>
<td>Special Event, Wedding and Venue Rentals</td>
<td>N/A</td>
<td>N/A</td>
<td>Small - 1,000 sf</td>
<td>Small - 864 sf</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Large - 10,465 sf</td>
<td>Large - 2,116 sf</td>
</tr>
<tr>
<td>Sustainable - Stormwater/LID Design Principles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 75: Case Studies – Comparing & Contrasting Infrastructure**
Farm infrastructure is the foundation for being able to host agritourism activities. *Figure 75* looks at the similarities and differences between infrastructures offered by the various case studies. The smallest farm store noted is located at Hickory Nut Gap Farm, which happens to be the largest agritourism farm studied. Greenlands Farm and Mike’s Farm both use their farm stores as bakeries, which is why their farm store is larger than Hickory Nut Gap Farm’s. On average, farm stores were found to be 3,638 sf. Mike’s Farm is the only agritourism operation that offers a stand-alone restaurant/cafè building. Mike’s Farm is also the only agritourism operation that offers full service on-farm dinners. Pick-your-own plots/orchards are 3.14 acres on average.

Special event venue rentals are offered by both Hickory Nut Gap Farm and Mike’s Farm. Both farms offer two options for venues, which ultimately gives the customer the choice to pick an event space that suits their needs. On average, the small venues were found to be 932 sf, and the large venues were 6,290 sf. Hickory Nut Gap Farm’s big barn was an exceptionally large venue space, which ultimately skewed the average data. That being said, approximately 10 sf per person can be used to calculate the size needed for an event venue. Both Hickory Nut Gap Farm and Mike’s Farm charge a fee to rent their event space. Mike’s Farm rents their large barn venue out for $2,500/day, and $500/day for the small venue. Hickory Nut Gap Farm charges $100-150 per every two hours, and during the Fall the price increases to $200-250 per every two hours. Hickory Nut Gap Farm charges the same prices for both their small and large venues.

Livestock paddocks varied in size, and were found to be on average 3 acres per paddock. Hickory Nut Gap Farm, which produces the most amount of meat among all of the case studies researched, has the largest livestock paddocks at 5.0 acres per fenced...
pasture. It is important to note that due to the large farm sizes, and isolated parcel locations, each farm’s total number of livestock paddocks was not calculated.

Lastly, the number of parking stalls was handled in different ways by each farm. All the farms have informal, permeable parking, however the demand for parking varied greatly depending on the farm. Mike’s Farm and Hickory Nut Gap Farm are both highly programmed in agritourism attractions, and therefore need more parking. Parking at Mike’s Farm fluctuates depending on the season. On average, Mike’s Farm has 34 primary parking stalls, yet during the peak agritourism season, Mike’s Farm can allot for an additional 134 cars with dedicated overflow parking. Hickory Nut Gap Farm has one area of parking, which allows for 100 cars. Greenlands Farm can accommodate 25 cars, which is also a significant number considering how small of an agritourism operation Greenlands Farm is.

Key Takeaways

All four case studies are considered successful in their agritourism endeavors, and components of each can be applied to future transitioning farms. A farm’s flexibility, and having multi-functioning and programmable spaces is important in any sized agritourism operation. A great example of a flex-space is a visitor’s center that also serves as a gift store, café/bakery, and as a space for how-to classes. Community Supported Agriculture is very advantageous for agritourism farms. Programs like CSA help farms receive a steady source of income, which is not always consistent in agritourism. Lastly, small farms are implementing the same agritourism attractions as larger farms, and ultimately are not being deterred in implementing something solely because of their acreage.
Twiddle Dee Farm was chosen as the site for the projective design. Twiddle Dee Farm is a North Carolina Century Farm that has traditionally generated revenue from row crop production, but is now looking to transition to agritourism activities that are primarily geared for adults. The following chapter will look at Twiddle Dee Farm from a traditional landscape architecture design approach. The design process begins by conducting a site inventory and analysis, which in return helps determine design opportunities and constraints. In coordination, the landscape architect and farmer then develop programmatic elements, and ultimately a rendered master plan with recommendations is generated. The illustrative master plan and supporting graphics will aid in visually expressing the changing business model of the farm.
Inventory and Analysis: Location & Census Data

Figure 76: Twiddle Dee Farm: Site Location Map - North Carolina (Benbennick, 2006)

Figure 77: Twiddle Dee Farm: Site Location Map - Sampson County (Benbennick, 2006)
Twiddle Dee Farm lies within North Carolina’s Coastal Plain Region, *Figure 77*. More specifically the farm lies within the county of Sampson and city of Clinton, *Figure 77*. The majority of Sampson County is rural farmland, however, as pointed out in Chapter 3, Sampson County has lost a significant number of farms over the recent years. To be specific, Sampson County’s total number of farms decreased from 1,203 in 2007 to 1,067 in 2012. Total acreage in farms also decreased from 321,454 acres to 291,635 acres. The average sized farm in Sampson County, per the 2012 Census, is 273 acres. In conclusion, as with the growing trends across America and North Carolina, Sampson County farms are also consolidating.

According to *Figure 77*, Sampson County had a population estimate of 63,724 as of July 1, 2015. At approximately 25%, a majority of the population are persons under the age of 18. Contrary, 16% of the population is over the age of 65. The high number of young adults in the county is well above average for the state, *Figure 79*, and the low number of senior citizens is below average for the state, *Figure 80*. The census data clearly illustrates a strong number of youth in Sampson County, a demographic that according to research findings has had a growing disconnect from the rural landscape. In addition, case studies have shown that a majority of volunteer efforts for farms have been from young adults. This should be of particular interest to Twiddle Dee Farm as it develops programmatic elements that attract young adults.
### Table

#### Population

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population estimates, July 1, 2015, (V2015)</td>
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#### Age and Sex

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<td>Persons under 5 years, percent, July 1, 2014, (V2014)</td>
<td>6.5%</td>
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<td>Persons under 5 years, percent, April 1, 2010</td>
<td>6.9%</td>
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<td>Persons under 18 years, percent, July 1, 2014, (V2014)</td>
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<td>Persons under 18 years, percent, April 1, 2010</td>
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<td>Persons 65 years and over, percent, July 1, 2014, (V2014)</td>
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<td>Persons 65 years and over, percent, April 1, 2010</td>
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<td>Female persons, percent, July 1, 2014, (V2014)</td>
<td>50.8%</td>
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<td>Female persons, percent, April 1, 2010</td>
<td>51.0%</td>
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*Figure 78: Sampson County Census Data (United States Census Bureau, 2016)*
Figure 79: North Carolina Census: Percentage of Persons Under 18 (United States Census Bureau, 2014)
Figure 80: North Carolina Census: Percentage of Persons 55 Years and Over (United States Census Bureau, 2014)
Clingman Bizzell Peterson first purchased Twiddle Dee Farm with bonds in February of 1913. The original deed stated that there was about 75 plus acres, and according to one source, there was a structure already on the farm, which served as the building block for several additions and renovations. Clingman Bizzell Peterson and his wife, Lola, had four children, with Claxton James Peterson being the only son. Miss Lola and Mr. Peterson kept a garden in the backyard, and raised hogs and chickens. There was a smokehouse in the back that was used in the curing of slaughtered hogs that took place once a year for a celebratory meal.

As Clingman and Lola got older, Claxton James Peterson began farming the land for his family. He ultimately inherited the farm itself, and his sisters received the house,
surrounding three acres, and other land off-site. Over time, the sisters sold the house and an acre on which it sits, but Claxton James Peterson married a local woman, Irma Bass, and her father deeded over a farm to the newlyweds as a wedding gift. This farm just happened to lie contiguous to the Peterson farm, bringing the total acreage to around 107 acres. Claxton and Irma would end up raising three children, two sons and a daughter, and the family grew up tending to what would be a traditional Sampson County tobacco farm. As they got older, all three children of Claxton and Irma moved away from the farm, yet Claxton continued to cultivate the land for many years until he was no longer able. In his later years, the farm would be rented out to nearby relatives who also used it for row crops, and in 2002, Chris Peterson (son of Claxton and Irma), and his wife Carla Peterson purchased 15 acres, a home, and some outbuildings that were located directly across the highway from Irma Bass Peterson. They had always dreamed of returning to the farm, and nowadays, Chris and Carla Peterson are the sole owners and operators of Twiddle Dee Farm.
Inventory and Analysis: Parcels & Acreage

*Figure 82* depicts Twiddle Dee Farm’s parcels, acreage, and overall layout. The farm sits adjacent to HWY. 421, and is comprised of seven parcels accounting for 108.34 acres. Twiddle Dee Farm’s size is a little more than one-half the average farm size in Sampson County and, of the case studies looked at, it is most similar to Mike’s Farm in size. Also similar to Mike’s Farm and Hickory Nut Gap Farm, Twiddle Dee Farm’s overall acreage is non-contiguous. The cause of the divided parcel locations is a state-maintained two-lane paved county road (HWY. 421), which ultimately separates a 15-acre parcel from the rest of the farmland. Similar to Greenlands Farm, Twiddle Dee has an opportunity to attract a transient clientele. Hwy. 421 is a popular route for vacationers heading to the beach in Wilmington, North Carolina and/or Myrtle Beach, South Carolina. Hwy. 421 is also used as an Interstate 40 alternate travel route between Greensboro and Wilmington and between Raleigh and Wilmington.
Figure 82: Twiddle Dee Farm: Parcels & Acreage (Map Base: www.googlemaps.com)
Inventory and Analysis: Existing Plants & Wildlife

A majority of the site has been clear-cut of most trees, however approximately 1/3 of the farm remains densely wooded with mature forest canopy consisting of mostly *Quercus* spp. (Oak), and *Pinus* spp. (Pine). A detailed list of some of those plants within the mature woodlands include:

Overstory Trees:

- *Carya illinoensis* (Pecan, non-native)
- *Liquidambar styraciflua* (Sweetgum, native)
- *Pinus palustris* (Long Leaf Pine, native, state symbol)
- *Pinus taeda* (Loblolly Pine, native)
- *Platanus occidentalis* (Sycamore, native)
- *Quercus nigra* (Water Oak, native)
- *Quercus palustris* (Pin Oak, native)
- *Quercus* spp. (Various Oak Species, native)

Understory Trees:

- *Betula nigra* (River Birch, native)
- *Cornus florida* (Flowering Dogwood, native, state flower)
- *Ilex opaca* (American Holly, native)
- *Magnolia virginiana* (Sweetbay Magnolia, native)
- *Prunus caroliniana* (Carolina Cherry Laurel, native)

Shrubs:

- *Callicarpa americana* (American Beautyberry, native)
• *Ilex vomitoria* (Yaupon Holly, native)

• *Rhododendron* spp. (Azalea, native)

• *Rubus* spp. (Wild Blackberry, native)

Vines/Groundcover:

• *Gelsemium sempervirens* (Carolina Yellow Jessamine, native, state vine)

• *Lonicera japonica* (Japanese Honeysuckle, non-native)

• *Lonicera sempervirens* (Coral Honeysuckle, native)

• *Smilax rotundifolia* (Common Greenbrier, native, weed)

• *Toxicodendron radicans* (Poison Ivy, native, weed)

• *Vitis rotundifolia* (Muscadine Grape, native)

Wildlife in the area is plentiful, and animals range from the bottom to the top of the food chain. The following is a list of known wild animals in the farm's general vicinity:

• Black Bears

• Coyotes (seen at Twiddle Dee Farm)

• Deer (seen at Twiddle Dee Farm)

• Wild Turkeys (seen at Twiddle Dee Farm)

• Beavers (seen at Twiddle Dee Farm)

• Hawks (seen at Twiddle Dee Farm)

• Red Wolves

• Red-Cockaded Woodpecker (seen at Twiddle Dee Farm, a federally endangered species)
• Other types of woodpeckers and other birds such as cardinals, blue jays, other (seen at Twiddle Dee Farm)
• Snakes - chicken/rat, king, water moccasin, and copperhead (all seen at Twiddle Dee Farm)

Due to the fact that Twiddle Dee Farm serves as a place for not only humans, but also native wildlife it is important that the master plan is receptive of keeping the wildlife and potential visitors separated. Some of the wildlife seen at Twiddle Dee Farm are potentially fatal if crossed, and therefore the necessary measures need to be taken to limit potential risks, and in the rare case of an emergency the plan should incorporate a safe area that respondents can get to quickly. In addition, livestock paddocks need to be properly laid out and fenced off to strictly keep wildlife predators out. Fencing livestock off will also help establish clear boundaries for visitors and once again limit the farm’s risk.

Inventory and Analysis: Zoning

Twiddle Dee Farm is zoned “RA – Residential Agriculture District,” which according to the City of Clinton’s Planning Department entails:

It is intended to protect the agricultural sections of the community from an increase of urban density development that would make the land less suitable for farms and to protect residential development that is primarily dependent on private wells and septic tanks to insure a safe and healthy living environment. In addition, some uses that are necessary in a rural environment, which are nonresidential in nature may be allowed with conditions or by special use.
Inventory and Analysis: Urban Connectivity

Although not very large, Clinton is by far the largest city in the county and is looked at as a major agricultural marketing node. Clinton lies in close proximity to several major cities, military bases, and tourist attractions. Ten major cities (>50,000 population), which harbor a high number of potential visitors to the farm, are within a 2 hours drive of Twiddle Dee Farm:

- Raleigh, NC (425,538 pop.)
- Greensboro, NC (278,654 pop.)
- Durham, NC (241,174 pop.)
- Fayetteville, NC (210,468 pop.)
- Cary, NC (144,671 pop.)
- Wilmington, NC (111,773 pop.)
- Greenville, NC (87,241 pop.)
- Jacksonville, NC (78,190 pop.)
- Chapel Hill, NC (59,653 pop.)
- Rocky Mount, NC (56,334 pop.)
Figure 83: Twiddle Dee Farm: Context Map (Map Base: www.googlemaps.com)
Inventory and Analysis: Ecological Connectivity

Figure 84 depicts the ecological connectivity in the greater Twiddle Dee Farm area. As previously noted, a major highway goes through the middle of Twiddle Dee Farm, and ultimately creates an obstacle for migratory animals. In Figure 84, all of the forest canopy areas are shown in green. The unsaturated black and white zones are those areas that may have housing, livestock facilities, and/or open fields that ultimately do not serve as refuge areas for wildlife. As illustrated, Twiddle Dee Farm serves as a major wildlife corridor. In fact, a part of Twiddle Dee Farm offers a continuous undisturbed forest canopy that acts as a suture bridging the gap between the ecological habitats west of Hwy. 421 and those which lie east of Hwy. 421. This is of significant importance to the area since fully canopied wildlife corridors are few and far between. In the bigger picture, these ecological corridors ultimately help lower the death rates of wildlife due to human activities or structures, discourage inbreeding due to isolated wildlife populations, and prevent habitat fragmentation. The fact that Twiddle Dee Farm lies on the backbone of such a major ecological passageway is a natural commodity. The design for Twiddle Dee Farm will need to successfully create cohesion between the public and natural realms.
Figure 84: Twiddle Dee Farm: Ecological Connectivity (Map Base: www.googlemaps.com)
Inventory and Analysis: Climate

Figure 85: North Carolina –USDA Plant Hardiness Zone Map (USDA Plant Hardiness Zone Map, 2015)

Clinton, NC (Sampson County) lies within the USDA Plant Hardiness Zone 8A. The average annual extreme minimum temperature is 10-15 degrees Fahrenheit. According to The Old Farmer’s Almanac, Clinton, North Carolina typically experiences the first fall frost on October 30th (50% chance), and the last spring frost on March 31st (50% chance). (www.almanac.com). This gives Clinton, North Carolina approximately 212 growing days in a year. Figure 86 and Figure 87 are calendars depicting the proper dates to sow and harvest the 30 most popular vegetables and fruits in the Clinton, NC climate region.
## PLANTING CALENDAR

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<tr>
<th>Plant</th>
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*Figure 86: Planting Calendar Part I (www.almanac.com)*
### PLANTING CALENDAR

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<th>Plant</th>
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*Figure 87: Planting Calendar Part II (www.almanac.com)*
As illustrated in Figure 88, Clinton, NC reaches an average high of approximately 90 degrees Fahrenheit during July. July also coincides with the highest average precipitation, which is just shy of 6”. It is important to point out that though the hotter months are receiving the higher amounts of precipitation this will most likely not be enough rainfall to substantially develop any proposed vegetables and fruits. Irrigation may need to be considered in the design proposal to ensure that the pick-your-own vegetables are receiving adequate water in order to strive.

Figure 88: Clinton, NC – Monthly Climate Averages (US Climate Data, 2015)
Inventory and Analysis: Soil Type

Being that the site is within the Coastal Plain region, various types of sandy loam soils are predominant at Twiddle Dee Farm. Sandy loam soil is generally a well-balanced mixture of sand, silt, and clay, but usually sand is found to be slightly more prevalent than the other two. Plants that like well draining soils will thrive in this natural planting bed, and these soils will usually not require any additional amendments to the composition. Vegetables, fruits, and nuts that will thrive in sandy loam soils include:

- Cucumbers
- Onions
- Lettuce
- Tomatoes
- Sweet Corn
- Okra
- Radishes
- Eggplants
- Carrots
- Pole Beans
- Potatoes/Sweet Potatoes
- Spinach
- Blackberries
- Blueberries
- Pecans
Inventory and Analysis: Topography, Waterways & Floodplains

*Figure 89* below best illustrates the site inventory and analysis of the topography and waterways found at Twiddle Dee Farm. As one can see, the site is divided into two general watershed areas that eventually end up feeding into the same bodies of water. The centerline for Highway 421 acts as a ridgeline in the landscape resulting in the 15 acre detached parcel draining differently then the rest of the site. For both watershed areas, the topography throughout can be summarized as fairly flat, however the 93.34 acres on the west side of 421 does quickly taper off in areas immediately adjacent to the woodland creek. The contours marked in *Figure 89* are two-foot contour intervals, and overall the non-wooded areas have slopes that are generally less than 3%. This is important to note since ADA accessibility requires all ADA routes to be less then 5% and have cross slope no greater then 2%. Any ADA accessibility route with a slope greater than 5%, but not exceeding 8%, is considered a ramp and must have handrails.
Figure 89: Twiddle Dee Farm: Topography, Waterways, and Floodplains (Map Base: www.googlemaps.com)
Sampson County has numerous agritourism operations, which all are potential business competition for Twiddle Dee Farm. As noted in Figure 90, there are approximately 46 agritourism operations within Sampson County. These 46 farms have registered their operations with the North Carolina Department of Agriculture and Consumer Services, and ultimately this count is limited to only those agritourism farms that are recorded. The majority of agritourism operations in Sampson County are within close quarters to one another and lie towards the north and east sides of the county. Towards the southern end of the county agritourism farms become more spread out and located further away from the major highways. Twiddle Dee Farm is one of the few agritourism operations, and the only one south of the City of Clinton, that lies directly off Hwy. 421. This close proximity to a thoroughfare makes it easier to attract farm visitors.

There are 2 agritourism operations within a 5-mile radius of Twiddle Dee Farm, and 13 farms within 15-miles. On a daily basis these farms will compete more directly with Twiddle Dee Farm, however Figure 91 and Figure 92 note that there is little competition in the area when it comes to you-pick plots and farms offering diverse agritourism attractions. The lack of on-farm you-pick attractions in the greater Clinton area is an opportunity for Twiddle Dee Farm. The farm could be downtown Clinton’s closest registered you-pick operation, and the farm’s convenient location off the highway makes it easy for customers to get to. Furthermore, Twiddle Dee Farm could become a leader in Sampson County’s agritourism industry. The farm can market itself as one of the region’s only North Carolina Century Farms that offers historical and modern day agritourism attractions.
Figure 90: Sampson County Agritourism Farms Site Map

*Note: Agritourism operations noted have been registered with the North Carolina Department of Agriculture & Consumer Services as of 2017. This number does not include any agritourism operation not registered with the NC Department of Ag. & Consumer Services.
Figure 91: Sampson County You-Pick Agritourism Site Map

There are 17 agritourism operations in Sampson County that offer some form of you-pick, fresh produce attractions, (not including Twiddle Dee Farm)

*Note: Agritourism operations noted have been registered with the North Carolina Department of Agriculture & Consumer Services as of 2017. This number does not include any agritourism operation not registered with the NC Department of Ag. & Consumer Services
Figure 92: Sampson County Miscellaneous Agritourism Site Map

*Note: Agritourism operations noted have been registered with the North Carolina Department of Agriculture & Consumer Services as of 2017. This number does not include any agritourism operation not registered with the NC Department of Ag. & Consumer Services.*
Inventory and Analysis: Site Context & Views

As illustrated in Figure 93, traditional row crop farms surround Twiddle Dee Farm. These adjacent farms typically grow various melons (watermelons, cantaloupe, sprite melons), tobacco, corn, and soybeans. Due to the abundance of melons being grown in the area, Twiddle Dee Farm should concentrate on growing other types of fruits and vegetables in their you-pick plots. In addition to row crops there are also cows, turkeys, and chickens, and hogs being grown in the area. Large livestock houses can occasionally be smelled at Twiddle Dee Farm. The farm has a large forest canopy on the west side of the property that screens three of the livestock houses, yet the facility located along Mt. Gilead Church Rd. on the east side of Hwy. 421 is fairly open to Twiddle Dee Farm. As a result, a form of buffer (vegetative or hardscape) on the southeast side of Twiddle Dee Farm’s property should be taken into account in order to minimize the odor.

Figure 94 notes the natural commodities and primary view triangles at Twiddle Dee Farm. As previously mentioned, a large forest canopy sits on the west side of the property. An existing stream runs roughly perpendicular to Hwy. 421 and spans from the roadway to the woods. As a result, the farm’s cleared portion of land is bisected. Immediately adjacent to both the east and south sides of the farm are traditional row crop farms. Within the site’s boundary there are numerous positive view corridors. These views typically involve looking back towards the forested area, and as noted in Figure 89 the site gently slopes from east to west. Negative views are associated with looking back towards Hwy. 421, and the neighboring row crop farms.
Figure 93: Twiddle Dee Farm: Surrounding Farmland Context
Figure 94: Twiddle Dee Farm: Farm Boundaries & View Triangles
Twiddle Dee Farm has numerous structures already in place on the farm. Currently the farm has formal gardens, a small event stage, a farm stay, and artwork in the form of barn murals. In addition, the farm also has begun implementing several contained paddocks for livestock production. Agritourism programs, and infrastructure that has already been implemented at Twiddle Dee Farm include:

- Twiddle Dee Farm welcome sign (west of Hwy. 421)
- Farm Office (west of Hwy. 421)
- Farm Stay (west of Hwy. 421)
- Three (3) dilapidated greenhouses that were once fully operative and housed tobacco. All three greenhouses were destroyed during Hurricane Isabel in 2003, and have since been in a state of disrepair. Each greenhouse is approximately 60 yards long and 10 yards wide. (east of Hwy. 421)
- Two (2) large storage barns. (one on either side of Hwy. 421)
- Barn Mural (west of Hwy. 421)
- One (1) livestock barn (west of Hwy. 421)
- One (1) chicken house (east of Hwy. 421)
- Seven (7) Livestock paddocks (four (4) to the west of Hwy. 421 and three (3) to the east of Hwy. 421)
- Formal Gardens (west of Hwy. 421)
- Small Stage (west of Hwy. 421)
Figure 95: Twiddle Dee Farm: Existing Agritourism & Infrastructure

Three Additional Livestock Paddocks, One Storage Barn, and Three Non-Functioning Greenhouses Currently Exist Across Hwy. 421
Figure 96: Twiddle Dee Farm Site Photos I: Existing Agritourism & Infrastructure
Figure 97: Twiddle Dee Farm Site Photos II: Existing Agritourism & Infrastructure
Design Opportunities and Constraints

Twiddle Dee Farm has great natural and historical assets, which serve as key anchors in the new design. The farm is located in a historically rich agricultural community, it has natural wildlife corridors present on the land, and there are several man-made structures already in existence. This can be both an opportunity and a constraint, however good design will bring fresh ideas to the table all while working with the existing commodities. As noted in the research findings, small farms in the area have been selling out to the larger farms, yet Twiddle Dee Farm can serve as a local precedent study that survived corporate buyout by implementing alternative business practices. In addition to local impact, the site’s close proximity to many urban areas makes Twiddle Dee Farm’s pool of influence go well beyond the county lines. The site could potentially draw the interest of city dwellers with various backgrounds, and particularly the attention of university students (a target group that is becoming more concerned about today’s youth and their rural disconnect).

Site Design: Program

Developing a program is the foremost important step towards a successful agritourism operation. Twiddle Dee Farm has the location, natural resources, and history to make it a successful agritourism farm. Programming is needed for the farm in order to establish a clear clientele as well as develop diverse opportunities. Twiddle Dee Farm wants to become a retreat destination geared for adults, and therefore it is important to plan appropriately. It is also imperative to recall that previous research highlighted 46% of those visiting NC agritourism farms were families with small children. Therefore, the programing of Twiddle Dee Farm will not limit itself strictly to mature audiences, but rather
parents should feel comfortable in bringing their children in order to share in the rural lifestyle, engage in outdoor recreation, learn about the origins of food, and educate themselves on native horticulture amongst other opportunities. Based on popular North Carolina agritourism markets, case studies, site analysis, and seasonal interests the following programing is best suited to Twiddle Dee Farm:

- You-pick vegetables, fruits, nuts, and flowers
- Farm store & gift shop (selling various farm produce, eggs, and commodities)
- Farm store
- Horse boarding and riding
- Seasonal attractions and events, such as summer concerts and hayrides
- Farm café On-site chef, café with fresh to order foods, and farm-to-table dining
- Woodland trail, native plant walk, and horticultural education
- Formal gardens
- Historical tours, and machinery displays
- Farm stays, bed and breakfast, Air B&B
- Event hosting (weddings, reunions, or other special occasion events)
- Greenhouse flower & nursery production (not open to the general public)
- Livestock production (chicken, cattle, and sheep)
- CSA programs
- Farm tours
Twiddle Dee Farm Program

Goal Statement
To create diversified land uses for Twiddle Dee Farm that incorporate livestock education and production, outdoor recreation, wildlife habitat, native horticulture, and public visitation and awareness. The repurposed farm will serve as a model for North Carolina Century Farms and other small farms looking to diversify business practices via agritourism.

Objectives
- To fully transition traditional row crop fields to a rotational livestock paddock system.
  - Establish the quantity and size of paddocks needed for sheep, cows, horses, and donkeys.
- To create a viable plant palette that compliments the existing native fauna.
  - Note plants suitable for the site and ultimately thrive on their own in the coastal plain region of North Carolina.
  - Identify potential areas of restoration, and reestablish riparian plant communities where appropriate.
- To minimize impact to the native flora and fauna.
  - Keep proposed design within the already established and non-forested areas.
- To encourage the general public to visit the farm.
  - Provide educational opportunities to visitors
    - Botanical education - woodland trails, formal gardens, horticultural attractions
    - Grow-your-own vegetables
    - Historical tours, and machinery displays
  - Provide getaway and retreat opportunities to visitors
    - Farm stays - bed and breakfast
    - Event hosting - weddings, reunions, and other special occasions
  - Provide farm goods and commodities
    - Farm store & gift shop
    - Farm dining - on-site chef providing fresh to order food, and farm to table dining
    - Grow-your-own vegetable plots
    - Pick-your-own vegetables, fruits, and nuts
  - Provide recreational opportunities
    - Seasonal attractions and events - summer concerts, fall hayrides
    - Horse boarding and trail riding
    - Walking trails

Figure 98: Twiddle Dee Farm: Goals and Objectives
**Program Elements**

- Pasture Based Land
  - Fencing
  - Animal barns / shade
  - Hay storage
  - Forage vegetation
- Fallow Land
  - Wildlife habitat / corridor
  - Woodlands / vegetation
  - Native plant walk trails
- Recreation and Educational Facilities
  - Farm stay rental
  - Farm office
  - Visitor’s center
  - Visitor parking
  - Artwork
  - Miscellaneous barns
  - Event Stage
  - Wildlife observation deck
  - Recreational trails
  - Formal gardens
  - Stormwater management and education (bioswales, low impact development)

*Figure 99: Twiddle Dee Farm: Program Elements*
Site Design: Schematic Design

Five schematic concepts for Twiddle Dee Farm were generated from the programmatic elements developed by the landscape architect and farmer. Each concept takes into consideration the lessons learned from the four case studies, and various factors from the site inventory and analysis of Twiddle Dee Farm. In the end these schematic concepts will help guide the final master plan for the farm. Twiddle Dee Farm’s schematic concepts are designed in such a way that visitors are always welcome, yet the day-to-day operations of the farm are fully functional without any impediments. The first design decision made was to confine all agritourism activities to the 93.34 acres on the west side of Hwy. 421. This eliminates the need for a farm visitor to cross the road, and thus reduces the farm’s risk and liability. The 15-acre parcel to the east of Hwy. 421 is where the owner’s private residence is located, and will serve as an area for back of house operations, and greenhouse/nursery production. During the summer Twiddle Dee Farm, like Greenlands Farm, looks to entice beach goers as potential visitors and clientele. By concentrating all agritourism activities to the west side of Hwy. 421 the farm’s visibility to travelers going south to the beach serves as a strategic form of advertisement.
Figure 100: Twiddle Dee Farm: Master Plan Zones
Schematic Concept 1

Schematic concept 1 concentrates the majority of the new agritourism operations within close proximity to the existing farm stay. The proposed location for the farm store, parking, large barn/event venue, and large stage are all centrally located on the farm. Situating the agritourism operations in the middle of the farm helps keep daily attractions adjacent to one another, and ultimately provides easy access for visitors. The primary agritourism infrastructure is also situated adjacent to Hwy. 421, and therefore this layout is a great form of roadside advertisement. Beyond the daily agritourism attractions are 10 livestock paddocks. These livestock paddocks are situated adjacent to one another in two primary groups (group of 6 and group of 4). Another feature of concept 1 includes a series of circulation paths that help navigate visitors around the farm. These paths have been designed to minimize dead ends, and the loop layout ultimately brings users back to the centrally located parking lot. Concept 1 also offers ample overflow parking (two designated lots), which will be utilized during the peak agritourism season.

![Table: Concept 1: Pros vs Cons]

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agritourism attractions are centrally located - easy wayfinding</td>
<td>Centrally located agritourism attractions more readily mixes farm visitors &amp; livestock production. This ultimately increases risk on the farm due to visitors being closer to farm animals and farm machinery.</td>
</tr>
<tr>
<td>Roadside advertisement</td>
<td>Overcrowding during peak agritourism season is a concern due to the attractions being so close together.</td>
</tr>
<tr>
<td>Agritourism attractions are adjacent to one another &amp; are easily accessible from parking lot.</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 101: Twiddle Dee Farm: Schematic Concept 1 Pros Vs. Cons*
Figure 102: Twiddle Dee Farm: Schematic Concept 1
Schematic Concept 2

Unlike concept 1, schematic concept 2 spreads agritourism attractions out across the farm. The majority of agritourism attractions are still adjacent to Hwy. 421 as a means of advertisement, yet infrastructure is separated by the existing stream. The farm store and primary parking is adjacent to the farm stay. The large stage and large barn/event venue will not be used on a daily basis, and therefore are paired together on the other side of the stream. Spreading the agritourism operations out prevents overcrowding in one area, and the two parking lots provide direct access to the various agritourism attractions. Concept 2 offers a total of 10 livestock paddocks (6 additional paddocks to the already 4 existing paddocks), and a wildflower you-pick plot, which is a unique program element.

CONCEPT 2: PROS VS CONS

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agritourism attractions are grouped according to amount of use (daily vs occasional).</td>
<td>Physical barrier (stream) between agritourism attractions. No clear line of site/direct path between them.</td>
</tr>
<tr>
<td>Multiple parking lots provide easy access to the various attractions.</td>
<td>Livestock paddocks are smaller due to agritourism attractions being spread out.</td>
</tr>
<tr>
<td>Attractions being more spread out prevents overcrowding during peak agritourism season.</td>
<td>You-pick plots lie on the north side of the trees in the stream restoration area (minimizes sunlight).</td>
</tr>
</tbody>
</table>

Figure 103: Twiddle Dee Farm: Schematic Concept 2 Pros Vs. Cons
Figure 104: Twiddle Dee Farm: Schematic Concept 2
Schematic Concept 3

Schematic concept 3 concentrates all new agritourism operations within close proximity to one another, and on the southeastern most edge of the farm. The farm store, primary and overflow parking, large barn/event venue, and large stage are all located adjacent to one another, and immediately next to Hwy. 421. Separating the primary agritourism operations away from the farm stay provides more of an intimate experience for those guests staying in the overnight accommodations. Also by keeping the primary agritourism operations away from the majority of the livestock paddocks there is less interactions amongst visitors, livestock, and farm machinery. Reducing these interactions helps minimize the farm’s risk. The existing stream divides the CSA & you-pick plots in half, which is a con to the overall layout. There are 10 livestock paddocks, however paddock 8 is an outlier that is separated from the rest of the livestock infrastructure. The layout of paddock 8 is a disadvantage when it comes to easily rotating the livestock to different pastures.

<table>
<thead>
<tr>
<th>CONCEPT 3: PROS VS CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROS</strong></td>
</tr>
<tr>
<td>Agritourism attractions are adjacent to one another &amp; are easily accessible from the parking lot.</td>
</tr>
<tr>
<td>More private/intimate experience for farm stay guests.</td>
</tr>
<tr>
<td>Primary agritourism operations are away from the majority of daily livestock production - reduces risk.</td>
</tr>
</tbody>
</table>

*Figure 105: Twiddle Dee Farm: Schematic Concept 3 Pros Vs. Cons*
Schematic Concept 4

The primary difference between concept 3 and concept 4 is the location of the wildflower you-pick plots. In concept 3 the wildflower you-pick plots are located towards the back of the farm, yet concept 4 situates the wildflower you-pick attraction immediately adjacent to Hwy. 421. Similar to the other roadside agritourism attractions, the wildflower you-pick plots are a form of agritourism advertisement. They also provide an aesthetical value as visitors first approach the farm. Lastly, concept 4 is the only concept that provides a rain garden on both sides of the existing stream. This is beneficial for managing stormwater runoff on both sides of the stream.

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildflower you-pick plots provide an aesthetic appeal &amp; are also another form of roadside advertisement.</td>
<td>Overflow parking is limited</td>
</tr>
<tr>
<td>Multiple rain gardens manage stormwater runoff on both sides of the stream.</td>
<td>You-pick plots are not immediately adjacent to one another. Wildflower you-pick plots are isolated and not easily accessible from the parking lot.</td>
</tr>
<tr>
<td>Primary agritourism operations are away from the majority of daily livestock production - reduces risk.</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 107: Twiddle Dee Farm: Schematic Concept 4 Pros Vs. Cons*
Figure 108: Twiddle Dee Farm: Schematic Concept 4
Schematic Concept 5

Schematic concept 5 incorporates 11 livestock paddocks, which is the most livestock infrastructure offered amongst all of the concepts generated. Like concept 3 and 4, concept 5 concentrates the new agritourism attractions to the southeastern corner of the farm. That being said, the large barn/event venue is planned to go towards the back of the farm and away from Hwy. 421. The large barn is going to be used primarily for storage, and as a venue space for weddings, birthday parties, reunions, and like ceremonies. The design intent was to give the large barn as much privacy as possible. The barn is large enough to be seen from the road, however situating it towards the western edge of the property gives it more of a secluded destination feeling. This will also draw the attention of visitors to the farm, and encourage them to venture beyond the area immediately adjacent to the parking lot. Similar to previous concepts, the CSA & you-pick plots are located within close proximity to the farm store and parking lot as a means of easy access and roadside advertisement. The biggest drawback with concept 5 is the lack of parking. Parking is very limited, and there is not any designated overflow parking, which is important to have during the peak agritourism season.

<table>
<thead>
<tr>
<th>CONCEPT 5: PROS VS CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROS</strong></td>
</tr>
<tr>
<td>Ease of livestock production - ample livestock paddocks (qty. 11) all within close proximity to one another.</td>
</tr>
<tr>
<td>Secluded lrg. barn/venue space. Ideal destination with dedicated parking for private events.</td>
</tr>
<tr>
<td>You-pick veggie/fruit and CSA plots on south side of stream. (Full sun exposure).</td>
</tr>
</tbody>
</table>

*Figure 109: Twiddle Dee Farm Schematic Concept 5 Pros Vs. Cons*
Figure 110: Twiddle Dee Farm Schematic Concept 5
Site Design - Master Plan

A master plan illustrates the importance of site specific planning. The master plan depicts the essential role of the landscape architect in protecting environmentally sensitive land while utilizing the same land as valuable amenities that may be used to attract visitors. In addition, the landscape architect possesses the skills needed to create efficient functional relationships between such items as building locations, and road and pedestrian circulation. Twiddle Dee Farm’s master plan provides a visual and financial set of achievable goals for the future development of the farm. The master plan depicts additional paddock infrastructure for greater livestock production, several buildings and venue spaces, and a network of pathways to connect the pieces. On average, proposed infrastructure was sized similarly to the infrastructure noted in the design precedents examined in Chapter 4.

Taking the pros from the various schematic concepts, and factoring in the cons or what was not as successful, ultimately helped derive the master plan for Twiddle Dee Farm. When looking at the big picture, Twiddle Dee Farm has three distinct zones. Zone 1 (north of the stream) is geared primarily for livestock production, and daily working farm activities. Zone 2 (south of the stream) has been primarily designed to accommodate the general public and agritourism operations. As previously noted in the schematic concepts, the plan was configured this way in order to keep the majority of the public separate from the majority of the daily livestock production areas. That being said, these zones do overlap in functionality, and as a result there are two livestock paddocks within zone 2 and various agritourism elements within zone 1.

Zone 3 is the existing forested area that accounts for approximately 1/3 of the
farm’s acreage. The master plan is ecologically sensitive, and as a result the farm’s wildlife corridor remains intact. This is of significant importance since Twiddle Dee Farm’s existing forest canopy is noted as being a primary corridor for native wildlife. As another form of education and recreation, the master plan calls for a woodland trail that would capitalize on Twiddle Dee Farm’s natural assets. The woodland trail should follow the natural contours of the land in order to prevent soil grading (cut and fill), and the pathway material should be permeable in order to minimize impact to the existing tree roots.

Similar to the case studies, and as illustrated in all of the concepts, Twiddle Dee Farm’s master plan takes full advantage of roadside advertisement. The majority of agritourism attractions are situated within close proximity to Hwy. 421, and the primary parking lot can be easily seen and accessed from the highway. Immediately adjacent to the parking lot is the farm store, large stage, and CSA/you-pick veggie and orchard plots. For a majority of the year, both the farm store and you-pick veggie and orchard plots will be utilized on a daily basis. Situating these agritourism elements close to the parking lot is a major convenience for farm visitors. The large stage is located across from the farm store, and serves as a venue space. How-to classes, birthday parties, live music, and other celebrations can all take place on the large stage, and the farm store/restrooms are nearby for added convenience. The stage is situated adjacent to the stream, and various trees/flowers serve as a natural backdrop for the venue space.

Beyond the primary agritourism attractions is a large barn situated towards the back of the property. This barn will provide much needed storage, and serve as a large venue space for private events such as weddings, reunions, company retreats, etc. For privacy purposes the large barn is tucked away near the edge of the woods, and
strategically away from the general public. Since this barn will be occasionally used as an event space there will be a dedicated parking area immediately adjacent to the venue. Lastly, the master plan designates eleven paddocks, which gives the farmer the flexibility and space needed for rotational livestock. These paddocks aid in livestock production, but they also serve as educational opportunities for visitors.
Figure 111: Twiddle Dee Farm: Master Plan
<table>
<thead>
<tr>
<th>Agritourism Program Element</th>
<th>Quantity</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge at stream crossover</td>
<td>2</td>
<td>400 sf average</td>
</tr>
<tr>
<td>Farm Store &amp; Cafe</td>
<td>1</td>
<td>3,000 sf</td>
</tr>
<tr>
<td>Large Barn / Event Venue</td>
<td>1</td>
<td>2,500 sf</td>
</tr>
<tr>
<td>Large Performance Stage</td>
<td>1</td>
<td>1,000 sf</td>
</tr>
<tr>
<td>LID Principles</td>
<td></td>
<td>Incorporated throughout the farm</td>
</tr>
<tr>
<td>Livestock Paddocks</td>
<td>7 additional paddocks</td>
<td>2.22 acres average</td>
</tr>
<tr>
<td>Livestock Shelters</td>
<td>7</td>
<td>600 sf average</td>
</tr>
<tr>
<td>Long Leaf Pine Groves</td>
<td>2</td>
<td>0.90 acres average</td>
</tr>
<tr>
<td>Multi-use Path</td>
<td>1</td>
<td>7,545 lf (1.41 miles)</td>
</tr>
<tr>
<td>Wildlife and Pond Overlook Deck</td>
<td>1</td>
<td>1,000 sf</td>
</tr>
<tr>
<td>Woodland Path / Nature Walk</td>
<td>1</td>
<td>4,498 lf (0.86 miles)</td>
</tr>
<tr>
<td>You-Pick Fruit &amp; Vegetable Plots</td>
<td>1</td>
<td>2.48 acres</td>
</tr>
<tr>
<td>You-Pick Flowers - Wildflower Pasture</td>
<td>1</td>
<td>2.50 acres</td>
</tr>
</tbody>
</table>

Figure 112: Twiddle Dee Farm Master Plan: Infrastructure Proposed
Figure 113: Twiddle Dee Farm Master Plan: Overview Perspective
Figure 114: Twiddle Dee Farm Master Plan: Overview Perspective II
Figure 115, *Twiddle Dee Farm Master Plan: Proposed Circulation*, illustrates the future pathway systems at Twiddle Dee Farm. There are two major circulatory trails within the projected master plan. Both trails minimize dead ends, and each one offers something visually and educationally unique. The primary path option is a 20’ wide multi-use trail that goes all around the farm’s central core. This pathway is wide enough to accommodate tractors, and generally navigates between livestock paddocks. The multi-use path is a great way for visitors to easily guide themselves around the farm. The other pathway is a more adventurous route through the woods. Horseback riders, visitors looking for a more strenuous excursion, and horticulture/wildlife enthusiasts will be more inclined to walk along the woodland pathway. It should be noted that as a means to reduce the farm’s risk, horseback riding on the farm is limited to only those who board their horse(s) at Twiddle Dee Farm. Either way, both trail systems minimize dead end pathways and offer visual interest for visitors to the farm.

The farm’s public entrance will be located on the far southeast side of the property. In order to help direct visitors to the farm entrance, it is advisable that Twiddle Dee Farm incorporates additional roadside welcome signage in this area. The farm’s current driveways are proposed to become service entrances, and therefore access will be strictly limited to employees and emergency personnel only. By forcing visitors to consolidate to a single entry point there is significantly more order to the farm. Visitors will also be able to walk/bike in a safely contained environment that is free of vehicles.
Figure 115: Twiddle Dee Farm Master Plan: Proposed Circulation
There are a total of 7 existing livestock paddocks at Twiddle Dee Farm. Of these 7 paddocks there are only 4 located on the west side of Hwy. 421. In order to expand the farm’s livestock operations, the master plan calls for an additional 7 fenced in pastures. As a result, the added infrastructure will alleviate some of the work associated with having to move livestock back and forth across Hwy. 421. Twiddle Dee Farm plans on boarding horses, and raising cows/sheep for meat production. The future of Twiddle Dee Farm will have roughly 24.45 acres of fenced in pasture just on the west side of Hwy. 421. This amount of land will provide forage for approximately 24 horses, 24 cattle, or 122 sheep. The average size of a paddock will be 2.22 acres. Figure 116 further illustrates the paddock infrastructure proposed for Twiddle Dee Farm.
Figure 116: Twiddle Dee Farm Master Plan: Proposed Rotational Livestock Paddocks
Parking at Twiddle Dee Farm is designed to be flexible, and functions differently depending on what event(s) are taking place and the time of year. The primary parking lot is immediately adjacent to the main entrance and farm store. On a daily basis there is enough room for 58 vehicles, however a designated overflow area immediately adjacent to this lot can hold an additional 28 cars. During the peak agritourism season, there are 3 isolated overflow lots located throughout the property. These 3 lots coincide with various farm infrastructures. Overflow parking II is located adjacent to the farm stay, and is the closest lot to the farm’s main entrance. Overflow parking III is next to the office, formal gardens, and small event stage. Lastly, overflow parking IV is next to the large barn. Overflow parking IV is to be primarily used as a convenience lot for private events taking place at the large barn. At any given time Twiddle Dee Farm will be able to accommodate 166 vehicles. Figure 117 further depicts the proposed parking for Twiddle Dee Farm.
Figure 117: Twiddle Dee Farm Master Plan: Proposed Parking
Site Design – Farm Store:

All four case studies examined had a farm store. These farm stores were within close proximity to parking, and ultimately served as the headquarters of agritourism business. Twiddle Dee Farm’s master plan also incorporates a marque farm store. As noted on the master plan, the farm store is situated in close proximity to Hwy. 421. It is planned for this location due to its high visibility and accessibility from the road, and ultimately will serve as the public trailhead for the rest of the farm’s agritourism operations. It is imperative for business that the farm has sufficient wayfinding measures, and thus the farm store’s location and iconic look will help orient farm guests. The proposed site for Twiddle Dee Farm’s store also has a history of agricultural buildings. The specific site was once the location of a small barn, and that barn was one of the first structures built on Twiddle Dee Farm. During the 1990’s the barn ultimately collapsed due to excessive weathering and deterioration, however the master plan will pay homage to the barn by resurrecting another agricultural building in its place. Immediately adjacent to the farm's farm store will be informal, yet clearly delineated space for public parking.

Research findings suggested that flexible and multi-programmable infrastructure was a key to success for an agritourism farm. Hickory Nut Gap Farm had an impressive farm store, which also served as a kitchen, butchery, and dining area. The farm stores at Mike’s Farm and Greenlands’ Farm were also geared for mixed programming, and both incorporated a gift shop and bakery. The goal is to have the farm store at Twiddle Dee Farm function in a similar manner to successful case studies, and thus the building must be able to accommodate for an array of events.
The farm store at Twiddle Dee Farm is architecturally contemporary, however the building’s materiality and shed roofs harmonize well with the agricultural and rustic surroundings. The farm store is comprised of two detached buildings with an oversized porch connecting them. The larger building will be the primary farm store, and serve as a welcome center for visitors. At the farm store guests will be able to learn about the history of Twiddle Dee Farm, pickup a site map, purchase seasonal farm goods, enjoy a fresh and local lunch from an in-house deli/cafe, and/or partake in various seminar/educational classes. The smaller building will house restrooms for visitors.

Energy efficient aspects of both the farm store and detached restroom building were planned for during the design process. The buildings take full advantage of passive solar design principles. The farm store incorporates saw tooth-like shed rooflines and the restroom building has been designed with large clear stories in the upper areas of the architecture. Both buildings are oriented to face southward, which allows winter sunlight to fill the interior spaces through the large windows. The farm store also has two garage doors specified on either side of the building. Depending on the weather, these garage doors can be rolled up in order to provide the building with natural air circulation and ventilation, and as a result will help cut down on the buildings electricity consumption/costs. In addition, by opening up the large garage doors the oversized deck now becomes an expansion of the farm store’s floor. Spillover space increases the contiguous usable square footage, and as a result larger activities/programs can be accommodated more efficiently.

Lastly, the location of the oversized porch is unique from a topographical standpoint. Though most of Twiddle Dee Farm is fairly flat, the farm store and porch sit on
one of the farm’s highest points. As a result, guests standing or sitting on the porch are rewarded with unhindered views of you-pick vegetable plots, sheep paddocks, and pastures that gently taper off into an existing creek.
Figure 119: Twiddle Dee Farm: Farm Store Perspective II
Figure 120: Twiddle Dee Farm: Farm Store Perspective III
Figure 121: Twiddle Dee Farm: Farm Store Perspective IV
Figure 122: Twiddle Dee Farm: Farm Store Passive Solar Diagram
Site Design – Farm Perspectives & Supporting Graphics:

Figure 123 is a perspective of Twiddle Dee Farm’s main entrance. A large, permeable parking lot sits immediately adjacent to the farm store. Native plants provide pops of color for visual interest, and ultimately help draw the attention of the visitor to the farm store’s main entrance. In addition to planting beds, the farm’s main entrance is an ideal area to place a piece of historical farm equipment. A vintage farm tool can serve as both an educational opportunity and a form of homage to the site’s historical roots. Lastly, the route from the parking lot to the farm store is flat and ADA accessible.

Figure 124 is an image of the large performance stage. The large performance stage is oriented to face towards the south/farm store. In order to keep a professional and cohesive architectural look, the stage has been designed in a similar style as the farm store. A shed roof directs water back towards the stream restoration area, and the large overhang on the front side of the stage helps mitigate direct summer sun. The stage is downhill from the farm store, however it is elevated to give it some hierarchy. ADA accessibility for the raised stage will be handled on the backside (stream side) in order to not impede the front face of the deck.
Figure 123: Twiddle Dee Farm: Primary Public Entrance Perspective
Figure 124: Twiddle Dee Farm: Large Performance Stage Perspective

- Shed Roof (TIN) with Oversized Beams (Laminated Wood)
- Tapered Columns
- Raised Stage (Wood Platform)
- Stream Restoration Backdrop
- Open Lawn/Ampitheater Immediately in Front of Stage
- Paddocks Beyond Stream
- Swings, Picnic Tables, Sitting Area
Twiddle Dee Farm’s you-pick plots will be approximately 250’ x 350’ (87,500 sf or 2.00 acres). The 2.00 acres for you-pick plots is a little less than the 2.48 acres of you-pick plots at Hickory Nut Gap Farm, and the 3.80 acres at Mike’s Farm. It is larger than the CSA vegetable plots at both Greenslands Farm (0.80 acres) and Fickle Creek Farm (0.55 acres). As illustrated in Figure 125, Twiddle Dee Farm plans to offer both fruit and vegetable you-pick plots. You-pick plots are popular agritourism operations to implement, and both Hickory Nut Gap Farm and Mike’s Farm offer pick-your-own plots. Twiddle Dee Farm can also use these plots for a CSA program. Both Greenslands Farm and Fickle Creek Farm did not offer you-pick plots, yet they did have areas for CSA vegetable production. During their interview, Mike and Theresa Lowe (owners of Mike’s Farm) noted that you-pick plots were difficult due to inconsistent yields from year to year. That being said, the you-pick plots at Twiddle Dee Farm will be diverse, and include fruit tree orchards along with annual fruits and vegetables. Yield will always be unpredictable, and some plants will produce more than others, yet by keeping the you-pick plots diversified Twiddle Dee Farm will always be able to offer visitors you-pick options.

Horticulture and low impact design are two great educational opportunities that Twiddle Dee Farm can take advantage of. The farm already has a rich plant palette, however Figure 126 illustrates the master plan’s design intent for a long leaf pine grove. The long leaf pine is the state tree of North Carolina, and the proposed pine grove aims to educate visitors on the tree’s attributes and history. Figure 127 is a perspective of the farm’s proposed rain garden. The rain garden will help alleviate stormwater runoff by serving as a natural filter for the existing stream.
Figure 125: Twiddle Dee Farm: You-Pick Plots Perspective
Figure 126: Twiddle Dee Farm: Long Leaf Pine Tree Grove Perspective

STATE TREES: STANDS OF LONG LEAF PINES

LIVESTOCK PADDOCKS BEYOND

COLORFUL UNDERSTORY PLANTINGS

20' WIDE MULTI-USE FARM PATH - PERMEABLE, NATURAL MATERIAL

203
Figure 127: Twiddle Dee Farm: Rain Garden Perspective
As illustrated in *Figure 128*, each paddock has its own livestock shed. These sheds are oriented towards the east, and are done so in order to better protect the animals from late afternoon sun and prevailing winds from the northwest. Previously noted in *Figure 61, Suggested Space and Housing Guidelines for Fully Mature Farm Animals*, a three-sided shed is the ideal housing for horses, cattle, and sheep. Sheds at Twiddle Dee Farm will be wood framed with metal siding and roofing. Each shed is approximately 30’ x 20’ in dimension. Fencing for these paddocks will be permanent, and consist of wooden posts with welded wire metal infill. In order to help keep livestock from pushing up against the fence it is recommended that electrical tape be implemented at the top and bottom of the fence.
Figure 128: Twiddle Dee Farm: Livestock Paddocks Perspective
Site Design – Planting Palette Recommendations:

Twiddle Dee Farm has the opportunity to create a native horticulture experience. Already present on the farm are numerous native plants, and the following figures are a recommended list of flora that would enhance and expand upon the indigenous theme.
### Twiddle Dee Farm Recommended Plant Palette

#### Broadleaf Overstory Trees

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Sun</th>
<th>Water</th>
<th>Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Maple</td>
<td><em>Toxic to equine</em></td>
<td></td>
<td></td>
<td></td>
<td>Orange/red fall color - shallow roots Wet soils tolerant</td>
</tr>
<tr>
<td><em>Acer rubrum</em></td>
<td></td>
<td></td>
<td></td>
<td>40-70' Tall</td>
<td></td>
</tr>
<tr>
<td>River Birch</td>
<td><em>Betula nigra</em></td>
<td></td>
<td></td>
<td>70-80' Tall</td>
<td>Yellow fall color Drought tolerant Exfoliating bark</td>
</tr>
<tr>
<td>Sugarberry</td>
<td><em>Celtis laevigata</em></td>
<td></td>
<td></td>
<td>80' Tall</td>
<td>Yellow fall color Drought tolerant Exfoliating bark</td>
</tr>
<tr>
<td>American Beech</td>
<td><em>Fagus grandifolia</em></td>
<td></td>
<td></td>
<td>80' Tall</td>
<td>Yellow fall color Edible fruits Attracts birds</td>
</tr>
<tr>
<td>White Ash</td>
<td><em>Fraxinus americana</em></td>
<td></td>
<td></td>
<td>70-80' Tall</td>
<td>Attracts birds Deer tolerant Flowers April-May</td>
</tr>
<tr>
<td>Sweetgum</td>
<td><em>Liquidambar styraciflua</em></td>
<td></td>
<td></td>
<td>90-110' Tall</td>
<td>Attracts birds Deer tolerant Flowers April-May</td>
</tr>
<tr>
<td>Yellow Tulip Poplar</td>
<td><em>Liriodendron tulipifera</em></td>
<td></td>
<td></td>
<td>80-100' Tall</td>
<td>Fragrant leaves Deer tolerant No serious disease</td>
</tr>
<tr>
<td>Southern Magnolia</td>
<td><em>Magnolia grandiflora</em></td>
<td></td>
<td></td>
<td>60-80' Tall</td>
<td>Evergreen, large white fragrant flowers May-June</td>
</tr>
<tr>
<td>American Sycamore</td>
<td><em>Platanus occidentalis</em></td>
<td></td>
<td></td>
<td>80-100' Tall</td>
<td>Exfoliating bark with white trunk is a winter interest</td>
</tr>
<tr>
<td>Eastern Cottonwood</td>
<td><em>Populus deltoides</em></td>
<td></td>
<td></td>
<td>80-100' Tall</td>
<td>Fast growth rate Drought tolerant Ideal for streams</td>
</tr>
<tr>
<td>Black Cherry</td>
<td><em>Toxic to equine</em></td>
<td></td>
<td></td>
<td>60-100' Tall</td>
<td>Attracts birds Showy fragrant flowers April-May</td>
</tr>
<tr>
<td><em>Prunus serotina</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Willow</td>
<td><em>Salix nigra</em></td>
<td></td>
<td></td>
<td>30-50' Tall</td>
<td>Erosion and flooding tolerant High maintenance</td>
</tr>
</tbody>
</table>

**Figure 129: Twiddle Dee Farm: Plant Palette Broadleaf Overstory Trees**
<table>
<thead>
<tr>
<th>Broadleaf Overstory Trees</th>
<th>Conifers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Name</strong></td>
<td><strong>Scientific Name</strong></td>
</tr>
<tr>
<td>American Elm</td>
<td>Ulmus americana</td>
</tr>
<tr>
<td>Slippery Elm</td>
<td>Ulmus rubra</td>
</tr>
<tr>
<td><strong>Common Name</strong></td>
<td><strong>Scientific Name</strong></td>
</tr>
<tr>
<td>Atlantic White Cedar</td>
<td>Chamaecyparis thyoides</td>
</tr>
<tr>
<td>Eastern Red Cedar</td>
<td>Juniperus virginiana</td>
</tr>
<tr>
<td>Shortleaf Pine</td>
<td>Pinus echinata</td>
</tr>
</tbody>
</table>
| Longleaf Pine | Pinus palustris | ☀️ | 🌧️ | 40 - 70' Tall | Evergreen | Slow growth rate | Long leaves (12“+)
| *State Tree Historical Tree | | | | |
| Pond Pine | Pinus serotina | ☀️ | 🌧️ | 90 - 110' Tall | Very similar to loblolly pine |
| Loblolly Pine | Pinus taeda | ☀️ | 🌧️ | 90 - 110' Tall | Evergreen | Deer tolerant | Self seeds |
| Baldcypress | Taxodium distichum | ☀️ | 🌧️ | 90 - 120' Tall | Deer tolerant | Wet soils tolerant | Yellow fall color |

**Figure 130: Twiddle Dee Farm: Plant Palette Broadleaf Overstory Trees Con’t. & Conifers**
### Twiddle Dee Farm Recommended Plant Palette

#### Oak Trees

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Sun</th>
<th>Water</th>
<th>Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Oak</td>
<td><em>Quercus alba</em></td>
<td>☀</td>
<td></td>
<td>60 - 80’</td>
<td>Drought tolerant Dark red fall color</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Southern Red Oak</td>
<td><em>Quercus falcata</em></td>
<td>☀</td>
<td></td>
<td>60 - 80’</td>
<td>Drought tolerant Red to fall color</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Turkey Oak</td>
<td><em>Quercus laevis</em></td>
<td>☀</td>
<td></td>
<td>20 - 30’</td>
<td>Drought tolerant Red to brown fall color</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Overcup Oak</td>
<td><em>Quercus lyrata</em></td>
<td>☀</td>
<td></td>
<td>60 - 80’</td>
<td>Erosion tolerant Wet soil tolerant Yellow fall color</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Black Jack Oak</td>
<td><em>Quercus marilandica</em></td>
<td>☀</td>
<td></td>
<td>20 - 30’</td>
<td>Drought tolerant Black bark/trunk Not common</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Swamp Chestnut Oak</td>
<td><em>Quercus michauxii</em></td>
<td>☀</td>
<td></td>
<td>60 - 80’</td>
<td>Great red fall color Sweet acorns edible - cows eat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Water Oak</td>
<td><em>Quercus nigra</em></td>
<td>☀</td>
<td></td>
<td>50 - 80’</td>
<td>Wet soil tolerant Semi-evergreen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Cherrybark Oak</td>
<td><em>Quercus pagoda</em></td>
<td>☀</td>
<td></td>
<td>90 - 120’</td>
<td>Rapid growth rate Attracts wildlife Dark red fall color</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Willow Oak</td>
<td><em>Quercus phellos</em></td>
<td>☀</td>
<td></td>
<td>80 - 100’</td>
<td>Moderately fast growth rate Attracts wildlife</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Northern Red Oak</td>
<td><em>Quercus rubra</em></td>
<td>☀</td>
<td></td>
<td>70 - 90’</td>
<td>Drought tolerant Red fall color</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Post Oak</td>
<td><em>Quercus stellata</em></td>
<td>☀</td>
<td></td>
<td>40 - 50’</td>
<td>Drought tolerant Attracts wildlife Red fall color</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td>Black Oak</td>
<td><em>Quercus velutina</em></td>
<td>☀</td>
<td></td>
<td>50 - 80’</td>
<td>Drought tolerant Red-yellow fall color</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tall</td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**
- ☀: Full Sun
- ☀: Part Shade
- ☀: Part to Full Sun
- ☀: Full Sun
- ☀: Dry to Medium
- ☀: Medium
- ☀: Medium to Wet

*Figure 131: Twiddle Dee Farm: Plant Palette Quercus (Oak) Trees*
### Twiddle Dee Farm Recommended Plant Palette

#### Medium & Understory Trees

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Sun</th>
<th>Water</th>
<th>Size</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serviceberry</td>
<td>Amelanchier arborea</td>
<td>☀️</td>
<td>🌧️</td>
<td>15 - 30' Tall</td>
<td>Attracts birds Edible fruit, spring flowers, fall color</td>
</tr>
<tr>
<td>Hornbeam or Ironwood</td>
<td>Carpinus caroliniana</td>
<td>☀️</td>
<td>🌧️</td>
<td>20 - 30' Tall</td>
<td>Yellow, orange, and red fall color No serious pests</td>
</tr>
<tr>
<td>Chinkapin</td>
<td>Castanea pumila</td>
<td>☀️</td>
<td>🌧️</td>
<td>15 - 30' Tall</td>
<td>Attracts various wildlife</td>
</tr>
<tr>
<td>Hackberry</td>
<td>Celtis occidentalis</td>
<td>☀️</td>
<td>🌧️</td>
<td>30 - 40' Tall</td>
<td>Attracts birds &amp; butterflies Edible fruit</td>
</tr>
<tr>
<td>Eastern Redbud</td>
<td>Cercis canadensis</td>
<td>☀️</td>
<td>🌧️</td>
<td>15 - 30' Tall</td>
<td>Deer tolerant Attracts butterflies Pink flowers April</td>
</tr>
<tr>
<td>Flowering Dogwood</td>
<td>Cornus florida</td>
<td>☀️</td>
<td>🌧️</td>
<td>10 - 20' Tall</td>
<td>Attracts birds &amp; butterflies Flowers April-May</td>
</tr>
<tr>
<td>American Holly</td>
<td>Ilex opaca</td>
<td>☀️</td>
<td>🌧️</td>
<td>15 - 40' Tall</td>
<td>Attracts birds Showy red fruits Evergreen</td>
</tr>
<tr>
<td>Sweetbay Magnolia</td>
<td>Magnolia virginiana</td>
<td>☀️</td>
<td>🌧️</td>
<td>20 - 30' Tall</td>
<td>Fragrant white flowers May-June Semi-evergreen</td>
</tr>
<tr>
<td>Blackgum</td>
<td>Nyssa sylvatica</td>
<td>☀️</td>
<td>🌧️</td>
<td>30 - 40' Tall</td>
<td>Attracts birds Excellent red fall color</td>
</tr>
<tr>
<td>Sourwood</td>
<td>Oxydendrum arboreum</td>
<td>☀️</td>
<td>🌧️</td>
<td>30 - 40' Tall</td>
<td>Deer tolerant Fragrant white flowers June-July</td>
</tr>
<tr>
<td>Sassafras</td>
<td>Sassafras albicum</td>
<td>☀️</td>
<td>🌧️</td>
<td>20 - 40' Tall</td>
<td>Deer tolerant Yellow flowers April - May</td>
</tr>
<tr>
<td>Winged Elm</td>
<td>Ulmus alata</td>
<td>☀️</td>
<td>🌧️</td>
<td>40 - 50' Tall</td>
<td>Winged branchlets Disease: Dutch Elm</td>
</tr>
</tbody>
</table>

*Images showing different levels of sunlight and water with corresponding text descriptions.*

---

**Figure 132: Twiddle Dee Farm: Medium & Understory Trees**
### Twiddle Dee Farm Recommended Plant Palette

#### Fruit & Nut Trees

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Sun</th>
<th>Water</th>
<th>Size</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Bitter Hickory      | Carya cordiformis     | ☀️  | ♨️    | 50 - 70'   | Tall      | Good shade tree  
|                     |                       |     |       |            | No serious disease                                |
| Pignut Hickory      | Carya glabra          | ☀️  | ♨️    | 50 - 75'   | Tall      | Edible fruits  
|                     |                       |     |       |            | Yellow fall color  
|                     |                       |     |       |            | No serious disease                                |
| Pecan Tree *Non-native | Carya illinoensis    | ☀️  | ♨️    | 90 - 120'  | Tall      | Edible fruits  
|                     |                       |     |       |            | Good shade tree  
|                     |                       |     |       |            | No serious disease                                |
| Shagbark Hickory    | Carya ovata           | ☀️  | ♨️    | 60 - 80'   | Tall      | Edible fruits  
|                     |                       |     |       |            | Exfoliating bark is  
|                     |                       |     |       |            | a winter interest                     |
| Mockernut Hickory   | Carya tomentosa       | ☀️  | ♨️    | 50 - 70'   | Tall      | Edible fruits  
|                     |                       |     |       |            | Good shade tree  
|                     |                       |     |       |            | No serious disease                                |
| Native Persimmon    | Diospyros virginiana  | ☀️  | ♨️    | 20 - 30'   | Tall      | Edible fruit  
|                     |                       |     |       |            | Need both male & female plants                   |
| Fig Tree *Non-native | Ficus carica          | ☀️  | ♨️    | 10 - 20'   | Tall      | Edible fruit  
|                     |                       |     |       |            | Significant dieback in cold winters              |
| Black Walnut        | Juglans nigra         | ☀️  | ♨️    | 50 - 90'   | Tall      | Fragrant leaves  
|                     |                       |     |       |            | Edible fruits  
|                     |                       |     |       |            | Drought tolerant                                  |
| Apple Tree *Non-native | Malus spp.           | ☀️  | ♨️    | 10 - 20'   | Tall      | Edible fruit  
|                     |                       |     |       |            | Showy flowers during the spring                   |
| Red Mulberry        | Morus rubra           | ☀️  | ♨️    | 20 - 30'   | Tall      | Attracts birds  
|                     |                       |     |       |            | Edible fruit  
|                     |                       |     |       |            | Drought tolerant                                  |
| Apricot/Peach/Plum *Non-native Toxic to equine | Prunus spp. | ☀️  | ♨️    | 10 - 20'   | Tall      | Edible fruit  
|                     |                       |     |       |            | Plant away from livestock paddocks               |
| Asian Pear *Non-native | Pyrus spp.            | ☀️  | ♨️    | 10 - 20'   | Tall      | Edible fruit  
|                     |                       |     |       |            | Disease: Fire Blight                             |

---

**Figure 133: Twiddle Dee Farm: Fruit & Nut Trees**
Implementation Plan:

It is important for Twiddle Dee Farm to have its primary structures built before welcoming a significant amount of visitors. The farm’s first goal should be finishing the entire paddock infrastructure. This will require some upfront capital in order to fully implement all of the livestock fencing and shelters. Though the initial costs may be challenging, investing in the paddock infrastructure first is an ideal business strategy since the paddocks will be utilized on a daily basis. Upon doing this, Twiddle Dee Farm will be able to increase the number of livestock, and in return begin generating more additional income that can be applied elsewhere on the farm. Twiddle Dee Farm can sell their farm meats to local groceries or participate in a community supported agriculture program.

Second, Twiddle Dee Farm should implement the primary multi-use pathway system. This will help connect all of the paddocks, and guide the future locations of agritourism attractions. The pathway system should be clearly delineated and have proper wayfinding signage. A few ways that the pathway might be marked is via a material change that differs from the adjacent surroundings, lined edging (wood timbers, brick, rock/stone, grass, etc.) on the sides of the pathway, and/or signage.

After the major paddock infrastructure and pathway system is in place, Twiddle Dee Farm can begin concentrating on adding more agritourism attractions, and ultimately welcoming the general public to the farm on a daily basis. Erecting a farm store and offering a designated parking area is the first major agritourism attraction that Twiddle Dee Farm should incorporate. Farm stores are vital marketing tools, and having a
storefront will let the general public know that Twiddle Dee Farm welcomes visitors and is open for business.

Once the farm store is up and running, Twiddle Dee Farm should implement you-pick plots. Though case studies noted that you-pick plots were difficult, the potential reward is worth the risk. You-pick plots serve as a form of roadside advertisement, and supplying the plots with proper irrigation and a means of a weed suppressant are the only major costs/infrastructure needed to help promote successful yields. Depending on how good the seasonal harvest is, you-pick plots are an agritourism attraction that can generate significant monetary gains in its first season of operation. Like the farm’s meat production, Twiddle Dee Farm can also utilize the you-pick plot yields as part of their supply towards a community supported agriculture program. A multi-faceted approach with the plots will supply a larger range of customers, and thus generate more additional income.

After implementing you-pick plots, as part of the farm’s overall educational programming, Twiddle Dee Farm will incorporate rain gardens. Educational opportunities were noted to be of high importance for farm visitors, and thus Twiddle Dee Farm will implement program elements that foster learning. The primary purpose of the farm’s rain gardens will be to help mitigate stormwater runoff before it gets into the natural stream, however these rain gardens will also serve as a means of informative low impact design. The rain gardens will teach visitors the importance of sustainability, ecological mindfulness, stormwater mitigation, and native horticulture.

Lastly, Twiddle Dee Farm will start incorporating the master plan’s more specialty attractions. A large barn to serve as a venue rental, large stage for performances, pond
overlooks, horseback riding trails, and other items alike all require more capital investment to implement. These final agritourism attractions will make Twiddle Dee Farm a unique and special farm, however they are higher risk implementations. Therefore, these last program elements should be staged in over time as the farm’s gross annual income allows it.
Figure 134: Twiddle Dee Farm: Implementation Plan

Existing Agritourism & Infrastructure
4 Paddocks, Office, Farm Stay, Formal Gardens, Small Event Stage, and Barns

Phase I: Finish Paddocks & Pathways
7 Paddocks (14.49 acres of pasture), 7 Livestock Barns, Multi-use Pathway System

Phase II: Primary Agritourism
Farm Store, Parking, You-Pick, Stream Restoration

Phase III: Specialty Agritourism
Large Barn/Event Venue, Large Stage, Woodland Nature Trail, Pond Overlook
CHAPTER 6

CONCLUSION

Guiding Principles:

Farmers and landscape architects are capable of working together in order to increase the fiscal viability of small family farms in tandem with the changing agriculture industry. Environmentally and place sensitive site design will help leverage farm assets as a part of agritourism and increase profitability. In order to help achieve a successful site design, *Figure 135* and *Figure 136* lists some general design considerations. All of these design considerations were taken into account during Twiddle Dee Farm's master planning.
## Design Guidelines

<table>
<thead>
<tr>
<th>General Design Considerations</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Site Context</strong></td>
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</table>
| i. Location of agritourism operation | - Identifying the potential clientele from surrounding communities/cities.  
- Total number of similar agritourism operations (potential competition) within close proximity.  
- Ability to attract visitors to the farm  
- How to identify and utilize both natural and man-made commodities already present on the farm. |
| **2. Land Use** | |
| i. Site and operations capacity | - Total number of potential farm visitors  
- Total number of livestock, and the infrastructure necessary to accommodate these animals.  
- Total number of farm staff (full-time, part-time, volunteers). |
| ii. Agriculture | - Total acreage, plots sizes, and number of rotational paddocks needed for production. |
| iii. Agritourism | - Space needed for agritourism attractions.  
Appropriate layout that takes into consideration visitors to the farm. |
| iv. Conservation | - Low impact design (LID) principles  
- Wildlife preservation and enhancement  
- Native plant walks and education |
| **3. Accessibility** | |
| i. ADA and elderly accommodations | - Ensuring that operations are accessible to all, and satisfy the latest codes and regulations. |
| ii. Wayfinding | - Proper signage, path delineations, entrance markers, and other wayfinding techniques utilized to provide for easy navigability. |

*Figure 135: Design Guidelines I*
## Design Guidelines

<table>
<thead>
<tr>
<th>General Design Considerations</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4. Infrastructure, Programming and Planning</strong></td>
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</tbody>
</table>
| i. Sufficient | - Adequate program elements to accommodate visitors and keep them engaged.  
- Sizing infrastructure to meet the needs of daily operations (storage, production, etc.). |
| ii. Efficient | - Increase of overall site efficiency through careful planning by a landscape architect. |
| iii. Natural Commodities and Programming | - Turning site ecology into a fiscal asset through design and planning for visitor engagement and education. |
| iv. Professional Operations | - Integrate function and aesthetics through careful design by a landscape architect. |
| v. Educational Elements | - Nature experience/ecorevelatory design for urban visitors.  
- Authentic farm experience  
- Historical infrastructure |
| **5. Safety** | |
| i. Hardscape materiality | - Non-slip material for ground plane/walking surface.  
- All infrastructure should meet or exceed structural weight loads and builder codes. |
| ii. Softscape materiality | - Avoid plants that are poisonous to livestock.  
- Buffers to delineate areas off limits to the general public. |
| **6. Sustainability** | |
| i. Low Impact Design | - Green buildings - passive solar energy, energy efficient appliances, and buildings that take advantage of the natural surroundings.  
- Permaculture principles and stormwater management. |

*Figure 136: Design Guidelines II*
Conclusion:

Agritourism and rural planning takes a lot of time, and the considerations are seemingly endless. However, there is a strategic methodology to successful farm/agritourism design. Farmers and landscape architects should always begin by looking at the big picture. Understanding the site context, layout, and potential clientele determine what programmatic elements the farm needs. How the market is going to respond to an agritourism operation is one of the most difficult elements to predict. Implementing a diverse program and ensuring that it is successful takes a lot of investment, and more than likely will require a loan. It is important for the farmer and landscape architect to understand which agritourism elements are going to be most successful in generating capital in order to quickly pay back that loan. Reviewing precedent farms that have successfully implemented agritourism operations will help a farmer and landscape architect better understand what worked and did not work. In conclusion, landscape architects can help small farms capitalize on visual assets such as vernacular architecture and in tact environmental systems as attractions for farm visitors. This inherent capital, when augmented and revealed by new design intervention, may create economically viable and environmentally wholesome farms that serve as models and teaching tools for future generations.
REFERENCES


Ager, Jamie, Amy Ager, and Kelsey Winterbottom. "Interview Guide Questions." E-mail and phone interview.


Lowe, Mike, and Theresa Lowe. "Interview Guide Questions." E-mail and phone interview.


Nelson Byrd Woltz Landscape Architects.


APPENDIX A

INTERVIEW GUIDE QUESTIONS

Has your farm been in your family for multiple generations? If so, how long has your farm been a family owned & operated endeavor?

What have historically been the primary farming practices on your land?

What are the primary farming practices operated on your farm today?

Is agritourism a part of your farm’s business strategy? If so, what forms of agritourism does your farm offer?

What season(s)/month(s) does your farm offer agritourism activities?

What farming operations have been the most popular/profitable?

What farming operations have been the most work and difficult to implement? What has made those operations difficult?

If anything, what would you do different if given the chance to do it all over again?

What advice would you offer other NC farmers looking to implement agritourism activities as an alternative/additional form of business methodology?