Exploring Potential Innovative Marketing Approaches for US Agribusinesses

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ABSTRACT

Agribusinesses are multifaceted businesses that may be involved in all the phases of agricultural production, processing, manufacturing, distributing, and retailing. Although US agriculture is a multi-billion dollar industry, the majority of agribusinesses are considered small firms, having less than $250,000 in annual gross sales. This study investigates potential innovative marketing approaches for US agribusinesses, specifically for small farms and agribusinesses. One marketing approach involves an agritourism marketing tool based on an agricultural geocaching program, AgCache. The second proposed marketing approach explores the specialty crops marketing channel to institutional foodservice establishments. For AgCache, exploratory qualitative analysis was first conducted through a series of in-depth interviews with current AgCache site owners. This was followed by survey data collection and analysis using a probit model to assess the interest in hosting an AgCache. For the specialty crops marketing channel, a probit model was utilized in order to assess the barriers faced by small-scale specialty crop producers as well as their interests in selling to institutional foodservice establishments. Specific attention was paid to logistic and food safety marketing constraints. The results reveal that with adequate attention towards specified barriers, the two marketing approaches can be implemented by US agribusinesses. As well, there is also a strong interest by small farms and agribusinesses to implement these two marketing approaches. This study provides information valuable not only to small farms and agribusinesses, but also to rural communities’ economic development and stakeholders involved in the agricultural industry. Results will be of interest to those in, and seeking to support agribusinesses and small-scale farms.
DEDICATION

I would like to dedicate my Master’s thesis to my parents, Sharon Clark and Stuart DuBreuil, Jr. I am forever grateful for your unconditional love and support throughout my entire academic career. Thank you for always believing in me. I am truly lucky to have such wonderful parents like you.

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CHAPTER I: US Agribusinesses

Over the past decades, the United States agricultural industry has developed into a multifaceted system that specializes in farm production as well as other agricultural-related processes. According to Davis and Goldberg (1957), an agribusiness can be defined as “the sum total of all operations involved in the manufacture and distribution of farm supplies; production operations on the farm; and the storage, processing, and distribution of farm commodities and items made from them.” Adopting this holistic definition, agribusinesses can be categorized into a three-component system according to their primary activity: (1) input sector, (2) production sector, and (3) processing-manufacturing sector. Even with the distinctive categorization, these agribusiness sectors remain dependent upon each other for the whole agricultural system to function properly. Between these three sectors, it is often felt that the harmonious relationship begins with the farmer (Baruah, 2005).

The majority of US farms that produced raw agricultural commodities were categorized as family operations in 2007 (~98%). Of these, small family farms constituted 88 percent of the total farms in 2007. A small family farm, by definition, has “annual sales less than $250,000” (Hoppe & Banker, 2010). As well, 64 percent of farm assets and 76 percent of land in United States Department of Agriculture (USDA) land-retirement programs, such as the Conservation Reserve Program, were held by small family farms. Even though larger farms may be smaller in number, they produce the majority of agricultural production in the US (Hoppe & Banker, 2010). Larger farms provide the majority of agricultural production, which challenges small farms to remain competitive within the agricultural industry. Shifts in sales and technological advances in
production have contributed to very large farms producing the majority of agricultural production (Hoppe, MacDonald, and Korb, 2010). Because the majority of agricultural operations are located in rural areas, ensuring small farms remain competitive can help to support rural economic development.

I.1. Current Problem

Even with continued struggles, small farms still remain the majority of all US farms (~88%); (Hoppe and Banker, 2010). However, these small farms have seen decreases in median farm incomes. Despite high prices for many crops, 2012 was no exception, with median farm income projected to be -$2,799” (USDA, 2013b). As well, other sized farms have had difficulties in maintaining their farm incomes. A phenomenon known as “Ag in the Middle” describes the decrease in US farms that “operate in the space between the vertically integrated commodity markets and the direct markets” (Kirschenmann et al., 2004). Even with the majority of these farms sustaining annual gross sales between $100,000 and $250,000, it would not be accurate to classify these farms as midsized or small farms. “Many of these endangered ‘agriculture of the middle’ farms are what the U.S. Department of Agriculture’s Economic Research Service calls farming-occupation farms and large family farms” (Kirschenmann et al., 2004). These middle size farms are vital to the diverse agriculture in the US. For instance without these middle farms, the US may see decreases in foods with unique attributes, abilities to fight food security issues, and diverse, open landscapes (Kirschenmann et al., 2004).

In addition, the problem of rural economic development could also hinder the survival of small farms. For this study, the term “nonmetro area” will be used in reference to “rural areas” located in the United States. According to the USDA (USDA, 2013d), a “nonmetro” area is a combination of (1) open countryside, (2) rural towns
(places with fewer than 2,500 people), and (3) urban areas with populations ranging from 2,500 to 49,999. Figure 1 illustrates the relative distribution of metro and nonmetro counties across the United States.

![Figure 1: Metro and NonMetro US Counties, 2013. Source: USDA,ERS. 2013d. using data from the U.S. Census Bureau.]

As the majority of agricultural farms are located in rural or nonmetro areas, economic development of nonmetro areas is vital to the continuation of small-scale farms. Factors such as population growth, income, and employment are used to analyze a region’s economic well-being. According to the USDA Economic Research Service, 8.2 million people resided in nonmetro areas in 2011 (USDA, 2013c). From 2010 to 2012, a population shift occurred in which 1,261 nonmetro areas lost population, which equates to 302,000 people. However, nonmetro areas do not necessarily lose population, but instead can transition into metro areas due to rapid population growth (USDA, 2013e). For household income in nonmetro areas, the 2009 median household income was $40,135, which reflects a “4.5 percent decline in inflation-adjusted dollars” from nonmetro’s median income peak in 2007(USDA, 2012). In comparison, the median
household income for metro areas was $51,522. Therefore, nonmetro areas only receive 77.9 percent of the median household income of metro areas. For employment, nonmetro areas have continued to undergo lagged growth due to 2007 economic recession, as well as slowed growth in the sectors of manufacturing, education and health, and leisure/hospitality. Overall, nonmetro areas have been experiencing economic adversity with potential population losses, lower incomes, and lagged employment growth.

**I.2. Motivation: Supporting Economic Growth in Rural Areas**

With nonmetro areas experiencing economic adversity, this study’s main motivation is to support small farms and agribusinesses, which, in turn, will provide support for agricultural farms in the middle and rural economic development. Through the proposed potential marketing approaches, small farms and agribusinesses could potentially grow into middle size farms and resolve the “Ag in the Middle” dilemma. As well, supporting small farms and agribusinesses not only aids in the resurgence of middle farms but also provides various benefits to the environment and rural community. Benefits include preservation of farmland, diversification of agricultural products, locally grown foods, diversified farmland that includes perennials which serve as carbon sinks to reduce greenhouse gases, preserving the small farmer lifestyle, source of employment, a more diverse landscape, prevention of potential food security scares through diversification in crop genetics, and opportunities for outdoor recreation and tourism (Kirschenmann et al., 2004). Essentially, supporting the US rural economies simultaneously serves the small farmer, agribusinesses, the environment, and the public that wants to purchase foods with unique attributes.
I.3. One Potential Solution: Alternative Marketing Strategies and Techniques

In hopes of supporting the sustainability and profitability of small farms and agribusinesses, this study is focused on developing rural economies through providing two alternative marketing approaches for small farms and agribusinesses. One of the alternative marketing approaches is focused on an agricultural-focused geocache program, known as AgCache, which promotes agritourism in rural areas. This marketing approach is targeted towards small farms and agribusinesses. A second alternative marketing strategy is explored by considering the potential for specialty crop producers to market directly to institutional foodservice establishments. Institutional foodservice establishments considered in this study are schools, hospitals, and long-term care facilities. The general barriers faced by small-scale producers marketing through this channel, as well as the extent of their interests in entering the channel will be analyzed. This research is targeted towards small-scale farms in the Southern Sustainable Agriculture Research & Education (S-SARE) region.

I.3.1. Agritourism

Agriculture is considered to be multifunctional. Agriculture produces traditional commodities and non-commodity goods. Agriculture can also preserve wildlife and native plants, conserve rural heritage (Barbieri & Valdivia, 2009), protect environmental amenities, encourage landscape management, preserve biodiversity, and provide opportunities for agritourism activities (Marsden & Sonnino, 2008). Because these non-commodity outputs are public goods, they are considered another “function” of agriculture. “The concept recognizes that the countryside is more than an area for food
production and that agriculture plays a crucial socio-economical and environmental role in rural communities and society at large” (Cairol et al., 2009).

The many functions of agriculture can reflect the changing demands of consumers. The “demand for quality food production, for environmental, ecological and landscape values, for social and cultural aspects” such as consumer’s concern for humane treatment in the food production system, and “for the provision of jobs and the maintenance of rural culture” (Cairol et al., 2009).

Agritourism is a method in which all of the functions of agriculture intersect. Agricultural festivals, hayrides, petting zoos, u-pick farms, and bed and breakfasts are just a few of the examples of agritourism activities (Wicks & Merrett, 2003). These activities draw individuals and recreation spending from urban or semi-urban areas into rural areas. Increasing the number of agritourism offerings in rural areas to attracted tourists can increase total economic growth. In examining the case of Indiana, Ramsey and Schaumleffel (2006) found agritourism to be a vital component to the economic well-being of the rural area and family farm survival. Even though it does not guarantee increases in job growth, agritourism can still provide income stability for farm households. As well, agritourism can also provide an “economic-driver for high-amenity, rural communities,” in which, over time, agritourism activities could result in increases in infrastructure and decrease reliance on governmental support in rural areas (Wilson, Thilmany, and Sullins, 2006). Essentially, agritourism can not only support the smaller farm and agribusiness but also contribute to the overall economic well-being of rural areas through increases in local employment and income levels, reductions in poverty, and improvements in health and education (Brown and Reeder, 2005).
The first study presented here investigates an agritourism marketing approach known as *AgCache*. *AgCache* is an agritourism program based on the game of geocaching. Geocaching is a hide-and-seek game where participants use a GPS device to locate hidden geocaches, which are usually small containers. Geocaching is a relatively new game that has been gaining in popularity over the past ten years. According to the official geocaching site, the game recently celebrated its ten year anniversary in May 2010 (Groundspeak Inc, 2013). Since the launch of the website, Geocaching.com, in 2000, geocaching has grown from 75 to over 985,000 active geocaches worldwide. It is estimated that there are over 5 million active geocaching participants around the world with the number of geocaches and participants growing each year. (Groundspeak Inc, 2013).

*AgCache*, an agritourism-based program, focuses on geocaches hidden in agricultural areas. Sites such as pick-your-own agricultural operations, agricultural museums, and industry headquarters are a few examples of *AgCaches*. The study, *AgCache: Agribusiness Opportunities Through an Agricultural-Focused Geocache Program*, explores the potential for using *AgCache* as a marketing strategy for small farms and agribusinesses in Virginia.

**1.3.2. Specialty Crop Marketing**

Specialty crops are defined as “fruits and vegetables, tree nuts, dried fruits and horticulture and nursery crops, including floriculture” (USDA, 2013a). In US agriculture, specialty crop production has become a fast-growing industry with increases in production of $399 million, or 49 percent, between 2002 and 2007 (Martinez et al., 2010). Roughly 72% of the 247,772 U.S. farms classified as having specialty crop
production in 2007, have less than 100 acres in production (Vilsack, 2009). As well, roughly 92% of farms that produced fruits, vegetables and pulses, and nursery products were considered small farms based on the combination of the market value of agricultural products sold and government payments received (Vilsack, 2009). For these small farms, the most common forms of marketing for small farmers are direct-to-consumer sales, internet sales, and direct-to-retail/foodservice marketing (Martinez et al, 2010).

1.3.2.1. Direct Sales to Consumers

Direct-to-consumer marketing includes “agricultural products sold directly to individuals for human consumption from roadside stands, farmers’ markets, and pick-your-own sites” (Martinez et al., 2010). These marketing approaches are particularly used by small specialty crop farms in order to “retain some of the value-added” that would otherwise be captured by other firms in the supply chain.” In 2007, $1.2 billion in current dollar sales were generated from direct-to-consumer marketing (Martinez et al., 2010). The recent growth in direct-to-consumer marketing can be attributed to operations with annual gross sales over $50,000. One type of direct-to-consumer marketing is referred to as direct sales to consumers. The percent of total home consumption from direct sales increased from 0.15 percent in 1997 to 0.21 percent in 2007. Nationally, an average of $8,853 was received per farm from direct-to-consumer sales (Martinez et al., 2010). A portion of the increase in direct sales can be attributed to the growth in the various direct-marketing channels, such as farmers’ markets and community-supported agriculture (CSAs). However, even with the growth in this segment, direct sales to consumers only accounts for 0.4 percent of all agricultural sales (Martinez et al., 2010). These direct sales to consumers’ channels, such as farmers’ markets and CSAs, have continued to preserve small farms’ businesses; nonetheless, there are concerns with market saturation
and using these channels as a long-term viable strategy for groups of larger farmers (Brown and McNulty, 2006).

I.3.2.1. Internet Sales
In the 21st century, the Internet has become an important tool for enhancing marketing strategies for producers. The Internet can not only connect the smaller farms to suppliers, but also to a broader range of potential customers (Mirsha, Williams, & Detre, 2009). The advantages to Internet sales include that no added physical infrastructure are required, sales are completed with no visits required, flexibility in hours of operation, and online growth is somewhat unlimited. However, this type of marketing can have potential drawbacks, such as maintenance of website, payment security and methods, packaging, and shipping costs (Swisher & Sterns, 2003). In regards to economic impacts, Internet sales are categorized in the direct sales to consumers, which accounts for a small portion of the US agricultural sales (Martinez et al., 2010).

I.3.2.3. Institutional Food Markets
A third marketing channel for small farms is direct sales to institutional foodservice establishments. These establishments include “colleges and universities, nursing homes, hospitals, corporate cafeterias, conference centers, hotels and restaurants, state government-run institutions (prisons, county cafeterias), and through business subscription enterprises” (Pirog, 2002). In the U.S. foodservices sector, institutions are the second largest with only eating and drinking businesses slightly ahead (Brown and McNulty, 2006). The institutional food sector spent $29.3 billion on food at public K-12 schools and universities, and another $40 billion at other institutions such as hospitals, commercial cafeterias, penitentiaries, military, and airlines in 2004 (Brown and McNulty, 2006). According to an Iowa study by Strohbehn and Gregoire (2002),
institutional foodservice establishments showed a strong interest in supporting local Iowa farmers who provided fresher and higher quality foods. Advantages for farmers who sell specialty crops to institutional food markets include stability in market, food traveling shorter distances, and potential growth through additional contracts (Gregoire & Arendt, 2005). Despite these potential benefits, this marketing channel still remains relatively untapped by the small farmers (Brown and McNulty, 2006). The quantity required, the need for homogenous products, record-keeping systems, and liability insurance, the implementation of infrastructure to facilitate shipments, the need for value-added processing, and communication channels are logistical barriers that have kept small-scale farmers from accessing institutional foodservice establishments (Westray, 2012). This marketing channel could provide a “lifeline for small- to mid-scale farmers struggling to stay afloat, and would improve the eating habits of millions of Americans, from young schoolchildren to elderly hospital patients” (Brown and McNulty, 2006). The study “Linking Specialty Crop Producers to Institutional Foodservice Establishments: General Barriers and Food Safety Considerations” explores the potential for small farms to sell directly to institutional foodservice establishments. In particular this study focuses on both the general barriers and food safety requirements faced by small farms who want to access this channel. This study is focused on small farms (those with $250,000 annual gross sales) in S-SARE region.
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Martinez, S., Hand, M., Da Pra, M., Pollack, S., Ralston, K., Smith, T., Vogel, S., Clark,


CHAPTER II: AgCache: Assessing the Potential Benefits of an Agricultural-Focused Geocache Program in Virginia

ABSTRACT

Geocaching is a modern day version of “hide and seek” where participants obtain coordinates from a geocaching website and must locate a geocache (usually some type of item or box) using a GPS device. This study explores the potential for an agriculturally-focused geocache program to support agribusinesses through advertising their businesses in hopes of attracting customers. This study analyzed qualitative data regarding the background and goals of the AgCache program and the benefits experienced from current AgCache sites. As well, quantitative data was analyzed using an ordered probit model to assess agribusinesses’ interests in potentially hosting an AgCache site in Virginia. Results indicate that agribusinesses located in Virginia are interested in hosting an AgCache; however, certain demographic characteristics and the agribusiness’s primary activity significantly influenced their level of interest in hosting an AgCache.

AgCache has the potential to benefit both the site hosts and the communities where these sites are located. Given the important and growing role of agritourism in supporting the economic well-being of rural communities, this initiative has the potential to economically benefit multiple businesses and entice more local and non-local residents to visit these rural areas.
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SECTION I: INTRODUCTION

Agriculture provides food for millions of people, as well as a unique lifestyle.

Farming is both a labor-intensive and capital-intensive. Since the 1950s, the US has seen a steady decrease in the number of farms (Figure 2.1).

![Graph showing the number of farms, land in farms, and average acres per farm from 1850 to 2007. The graph indicates a decrease in the number of farms while the land in farms remains relatively constant.]

The number of acres of farm land has remained relatively constant over the years. Today, most agricultural production is shifting towards the larger commercial farms due to economies of size and competitive advantage. Specifically, larger farms have competitive advantage over the smaller farms due to more specialized decision-makers in regards to the farm’s production and finances, more efficient utilization in regards technology adoption and improvements to the farm, and relative ease in accessing necessary resources such as capital, land, and labor (Hoppe & Banker, 2010). Therefore, for the small farmer to survive to this market, other forms of income, such as alternative business ventures that focus on non-commodity production have been adopted (Vogel, 2012). One such business venture is on-farm agritourism (Vogel, 2012). By advertising unique and/or local products, and offering unique farm experiences, entrepreneurial
farmers can increase the number of visitors to their site to diversify their income. In 2007, 95 percent of U.S. farm income from on-farm diversification was generated from custom work, direct sales to customers, and agritourism activities. Of the 394,966 farms that participated in on-farm diversification activities in 2007, the average farm household generated an additional $14,700 of income (Vogel, 2012). By itself, agritourism provided the average farm household with an extra $15,255 which accounted for 11.7% of the average income per farm (Vogel, 2012).

*AgCache,* a new geocaching program, is an innovative way for agricultural producers to connect with rural tourists. Geocaching is a modern day version of hide and seek where participants obtain coordinates or clues, and must locate a geocache (usually some type of item or box) using a GPS device. Participants try to find as many geocaches as possible while they enjoy their adventures to new places (Groundspeak Inc, 2013). Typically, there is no cost to participate. Cache sites lead participants to a variety of settings, including natural forests, urban locations, and historic/cultural areas. The goal of geocaching is much like that of a treasure hunt. By far, the US is the leading country in hosting geocaches with more than 630,000 sites, followed by Germany with approximately 158,000, and Canada with more than 101,000.

*AgCache* provides participants with geocache locations focused on agricultural areas. In doing so, *AgCache* allows for participants to discover new agricultural sites and to interact with local producers. As such, *AgCache* meets the needs of the consumers and the producers by promoting local tourism sites, as well as providing new marketing and sales opportunities.
I.1. Study Aim and Objectives

This study investigates the Virginia agritourism program, *AgCache*, and its potential perceived benefits to agricultural operations in Virginia. This research topic was chosen due to its uniqueness in promoting agriculture, its ability to be an alternative source of income, its potential to positively impact the future of Virginia agritourism, and its simplistic adoption for other agricultural operations across the country.

This study examines the potential of an agriculturally-focused geocache program to impact agricultural-related businesses in Virginia. Specifically, this study will investigate three objectives:

1. To identify and evaluate the perceived benefits that current *AgCache* sites gain from offering an agricultural-focused geocache.
2. To assess the potential supply, and constraints to the supply, of additional agriculturally-focused geocache sites.
3. To identify types and characteristics of agricultural organizations that would most benefit from and be most likely to participate in an *AgCache* program.

For current *AgCache* sites, the following hypotheses were proposed: (1) current *AgCache* sites will see additional benefits such as increases in visitors and revenues since the implementation of an *AgCache* and (2) current *AgCache* sites will recommend the program to similar agricultural organizations since they have not withdrawn from the program. Drawing from literature and previous studies, the following hypotheses were proposed for the potential *AgCache* sites: (1) potential sites will be more interested in hosting an *AgCache* if they have internet access, (2) potential sites will be less interested in hosting an *AgCache* with higher gross sales, (3) potential sites will be more interested in hosting an *AgCache* if customers directly visit the physical location of their businesses,
(4) potential sites will be more interested in hosting an *AgCache* if they have prior knowledge of geocaching, (5) potential sites will be more interested in hosting an *AgCache* if they have prior knowledge of the *AgCache* program, and (6) potential sites will be more interested in hosting an *AgCache* if they are involved in a direct marketing technique. A more detailed explanation of the chosen hypotheses can be found in Appendix A-1.

The results of this study may benefit both the private and public sectors. For example, the results may serve as a foundation for more state and national policies for tourism-based activities for small farmers. In addition, the results may also provide a basis for policy-making in regards to entrepreneurship for small farmers. In the private sector, results may be used as a method for individual farmers to reevaluate their current business ventures and their willingness to adopt new on-farm activities (Tew & Barbieri, 2012) As well, results from this study may provide valuable marketing information for current and future agritourism operations. More in-depth marketing information could potentially help farmers improve their operations and improve the overall agritourism industry in Virginia. Furthermore, the results could hopefully increase the awareness of the agriculture industry and local operations in Virginia.

I.2. Overview of Paper

This research paper examines the creation of *AgCache* and its benefits to current and potential *AgCache* sites. The topics of agritourism, geocaching, and *AgCache* are explained in Section II. Section III discusses the research methodology in two parts: Phase I and Phase II. Phase I consist of Stakeholder Group 1, the creators of *AgCache* and the site managers who participate with the *AgCache* program. Phase II consist of Stakeholder Group 2, the potential *AgCache* sites who could adopt an agricultural
geocache. Both groups’ research methodology is discussed in terms of research design, survey creation, sampling, data collection and preparation, and data analysis. Section IV discusses the results for both stakeholder groups. Lastly, conclusions including key findings, study limitations, recommendations and future options for the AgCache program are analyzed in Section V.

SECTION II: LITERATURE REVIEW

II.1. Overview of Agritourism

Agritourism can combine the various functions of agriculture. For example an apple farmer can provide tours to help promote the sale of value-added products such as cider and apple sauce. While touring, the farmer has the opportunity to educate the customers about his agricultural production while the customers enjoy the outdoor scenery. In this example agritourism not only helps to increase farm revenues, but it also strengthens the relationship between the producer and the consumers and produces benefits to the customers through outdoor recreation.

Although the term agritourism is gaining in popularity, tourism on farms and agricultural settings has been around for many years. According to Hatch (2008), agritourism began in the late 1800s when city dwellers started visiting the rural communities for short stays to escape the city life. In regards to the term “agritourism”, many variations of the term have been created over the years to describe on-farm tourism. On-farm recreation, agritourism, agrotourism, agritainment, and farm tourism are just a few of the variations found in literature (Busby & Rendle, 2000). Even with these variations, the terms rural tourism and agritourism are used interchangeably in the US (Sznajder et al., 2009).
Agritourism operations can be categorized based on the products and/or services offered. The most common products and/or services provided by agritourism operations include: (1) primary agritourism which includes participation and observation of manufacturing processes, educational tours, and farm zoos; (2) agri-accommodations including farm stays, agri-camping, and agri-hotels; (3) agri-food service such as home meals, canteens, and restaurants; (4) direct sales such as ‘pick your own’ operations and farm shops; (5) agri-sport such as hiking, horseback riding, hunting and fishing; (6) agritainment such as excursions, mazes, and gardens; (6) agri-therapy such animal-assisted therapy, medicinal plants, and specific dieting; and (8) cultural tourism such as historic tours, museums, and folk festivals (Sznajder et al, 2009).

In the past, “vacation farms” have been the most prevalent form of agritourism. For example, in Austria “approximately 25 percent of farms have been receiving tourists for nearly 100 years” (Hummerlbrunner & Miglbauer, 1994). In the 1920s, visiting farms was made more accessible by the invention of the automobile. In the U.S. rural recreation became popular during the Great Depression due to its relatively low cost. Through the 1980s and 1990s interest in bed and breakfasts and commercial farm tours grew. The demand for agritourism activities continues to grow today (Hatch, 2008).

While farms continue to diversify to find alternative revenues, supply of farm tourism has increased. In 2007 approximately 23,350 U.S. farms, roughly 1.1 percent of all US farms, received income from agritourism and other farm-based recreation, totaling slightly over $566 million (USDA: NASS, 2007a). The Agriculture Resource Management Survey conducted in 2004 by the United States Department of Agriculture states that more than half of all U.S. farms receiving recreational income are located in
the South. The survey also suggests that almost 60 percent of recreation farms specialize in “raising cattle and calves or horses, ponies, and mules (Brown & Reeder, 2008).

II.1.1. Benefits of Agritourism

Agritourism continues to evolve for economic reasons. From the perspective of those who own agritourism operations, agritourism offers a means of income risk reduction and income diversification. Cuts in government agricultural support programs, as well as seasonal fluctuations in farm income motivate farmers to seek additional forms of income (Nickerson, Black, & McCool, 2001). Offering recreational activities can generate revenue in the off-season for a farmer as well as aid in the employment of family members and deter the experienced and committed younger generations from leaving the family farm for outside employment (Brown, 1997).

In addition to economic reasons, agritourism thrives due to the desire for social interactions. “By promoting certain aspects of farming as a tourist attraction, agriculturalists educate the public about agricultural land and farming practices, while marketing a variety of retail products” (Hardesty, 2011). In some situations, educational tours are allowing tourists to observe and even help with the production processes on the operation (Sznajder et al., 2009).

Aside from economic and social reasons, agritourism continues to gain in popularity from its environmental and historic features. A Master’s thesis conducted by Sotomayor (2011) investigated the perceived socio-cultural, environmental, and economics benefits associated with visiting working farms, private forests, and state/national parks. This 2011 survey included 969 Missouri households that responded to a mailed questionnaire sent to 5,000 Missouri households. From this study, the respondents perceived the “Very Important” societal benefits from farms who offer
agritourism activities were environmental benefits such as preserving rural heritage and traditions, natural beauty and landscapes, and preserving natural resources. Other perceived “Very Important” benefits included socio-cultural benefits such as preserving rural heritage and traditions, and economic benefits such as revitalizing local economies.

Most studies focus on the motivations of farmers to start agritourism activities; therefore, the literature on agritourism benefits to the consumer is sparse. A study conducted by Carpio, Wohlgemant, and Boonsaeng (2008) estimated the “economic value of the rural landscape for farm visitors.” Using the data provided from the 2000 National Survey on Recreation and the Environment, the study was able to estimate a consumer surplus of $178.82 per trip. Of this value, the study estimated $33.50 is due to benefits from the rural landscape. Even with these economic values, agritourism spans a broad list of activities, which requires further research to properly identify factors affecting consumers’ decisions specifically related to each activity considered agritouristic (Carpio et al., 2008). Agritourism benefits not only the providers and consumers of the activities, but also the entire community. Overall, the United States is ranked third as the largest tourism destination. In 2006, the Travel Industry Association of America (TIA) estimated that travel and tourism activities generated $721.9 billion and 7.5 million jobs created for Americans (Goeldner & Ritchie, 2009). Spending on agritourism activities not only produces direct sales, but also accounts for additional economic spending and job creation. Profits generated from touristic activities such as agritourism can be reinvested into the local, regional and national economies through a concept called the multiplier effect. The multiplier effect or “multiplier impact” is the total amount of sales, output or
other economic benefits measure that has been generated once the initial tourist’s spending has flowed through the economy (Frechtling & Horváth, 1999).

II.1.2. Drawbacks of Agritourism

Agritourism certainly has undesirable traits. Principal among these traits is risk. Agritourism enterprises are exposed to different forms of risk, including financial, health, political, and economic. (Sznajder et al., 2009) The success of an agritourism business depends upon proper business plan and documentation (Walker, 2009) such as requiring guests to sign liability waivers or volunteer liability insurance (Sznajder et al., 2009).

Whenever starting a new agritouristic activity on a farm, more management time and effort is required away from the primary production activities. More maintenance work such as cleaning and organizing is required to ensure the public’s safety. Furthermore, maintaining privacy on the farm will become more difficult. Especially during peak season, privacy will be minimal for the operators. (Blacka et al., 2009)

II.1.3. Economic Impact of Agritourism

Despite the possible risks, “recent growth in agritourism is both demand and supply driven.” (Carpio et al., 2008) With farmers embracing new alternative forms of promoting agriculture and the public’s interest in agricultural life, the supply and demand are both steadily rising (Carpio et al., 2008).

As previously stated, agritourism can provide economic support for farmers. “Well-developed agritourism systems in rural areas have the potential to reverse negative economic trends by bringing in visitors and creating new jobs and local business ventures for rural residence” (Ramsey & Schaumleffel, 2006). In addition, agritourism stimulates farmers’ incomes. As reported in a 2008 study, an estimated $800 million to $3 billion a year was generated for U.S. farm income from agritourism activities (Carpio et al., 2008).
Agritourism is likewise a tool for rural development. For example, the state of Indiana, which has 75% of its counties classified as rural, launched the Indiana Uplands Wine Trail. This trail, stretching about 110 miles, allows residents to establish local restaurants, wineries, bed and breakfasts, and shopping locations for tourists’ uses (Ramsey & Schaumleffel, 2006). Another study conducted in Maine calculated the spending by business, farms, and workers specifically to agritourism activities. This study discovered that “taking into account the multiplier effect, agri-tourism was responsible for $40.8 million of economic activity in Maine, including 1,927 jobs that provided $7.4 million of income” (Allen, Gabe, & McConnon, 2006). From these results, 165 jobs were indirectly linked to agritourism activities, which emphasize the incidental impacts of agritourism in a community.

In regards to Virginia agritourism, McGehee and Kim (2004) discovered that most agritourism farms in Virginia consisted of pick-your-own produce, Christmas tree farms, hayrides, on-farm festivals and educational activities. While the number of Virginia farms who participate in agritouristic activities decreased from 610 farms in 2002 to 476 farms in 2007, income from agritouristic activities has increased. In Virginia, income, measured in nominal dollars, from agritourism and recreational services increased from $2,681,000 in 2002 to $12,909,000 in 2007 (USDA: NASS, 2007b). Figure 2.2 (below) shows the percent of farms with income from agritourism as depicted from the 2007 Census of Agriculture.
II.2. Geocaching

Geocaching is an innovative outdoor treasure hunt (Groundspeak Inc, 2013). Using a GPS-device, participants navigate to a specified location using a set of longitude and latitude coordinates supplied by the geocache provider. Once participants arrive at the location they search for a hidden location called a geocache. Essentially, the participants are trying to find as many geocaches as possible while enjoying their adventures to new places. Geocaching seeks to enhance human experiences and culture by emphasizing inquiry and learning. Essentially, geocaching tries to educate local and non-local residents about local knowledge and to discover local places that they never knew existed (Gray, 2007).
To start geocaching, participants simply need a GPS-device and the set of coordinates for the geocache location. Usually, participants register on an online site and enter a zip code or state to find geocaches in that area. Participants are provided with coordinates to each geocache site, and use a GPS to reach the geocache site. Once on-site, participants look for an item, such as a box, which contains a log that they sign to show that they have visited the geocache. Besides a box, other items that could be used as a container could be a birdhouse, a lunchbox, or a glass jar. Once the container is located and opened, participants can take an item in the box left by a previous visitor as long as they leave one in return (Groundspeak Inc, 2013).

There are many types of geocaches. For instance, geocaches can require participants to solve puzzles, riddles, or even math equations to reveal the coordinates as used in the mystery or puzzle geocaches. As well, multi-cache geocaches require participants to find more than one geocache in a designated area. Other types of geocaches that are categorized according to specific characteristics include Project A.P.E., Letterbox Hybrid, Wherigo, Cache In Trash Out, earthcache, virtual, webcam, 10 years event, and locationless (Groundspeak Inc, 2013). For more information on the types of geocache, please refer to Appendix A-2.

II.2.1. Who Participates

Geocaching provides an outlet for participants to escape from the demands of everyday life. The majority of participants can be categorized as computer techies, families, students, outdoor recreationists, and retirees. Geocaching is an accessible game to just about anyone (Taylor, Kremer, Pebworth, & Werner, 2010). Improving health, spending more family time, learning and educating, witnessing natural beauty,
challenging oneself, discovering new places and having fun are just some of the main reason why geocaching is continuing to grow in popularity for all age groups (Sherman 2004). Geocaching requires participants to walk to search for the cache. Geocaching encourages participants to exercise, thus, improving their health. Without even noticing, participants can find themselves walking miles in search of a geocache (Sherman, 2004).

Searching for geocaches can also be a family activity. The game encourages teamwork and family member bonding as they search for the hidden cache. Many of these caches can also be located in historic significant areas, which offers the chance for participants to have an educational opportunity. Some historic sites include Captain John Smith’s Geotrail in Chesapeake, Virginia, General Patton Museum in Fort Knox, Kentucky, and the historic Navajo Bridge in Marble Canyon, Arizona (Groundspeak Inc, 2013). Hiking through these historic places not only exposes participants to the history of the area, but also to the ecology and natural amenities (Sherman, 2004). These examples are just a few of the opportunities geocaching provides to enrich participants’ knowledge of the local area.

Geocaching is a relatively inexpensive activity. A GPS and a means of transportation are usually the only requirements to participate in geocaching. Recently, even government agencies and corporations have been using the sport to entice customers due to the “game’s openness and relatively low cost” (Gillin & Gillin, 2010). For example, the Arkansas State Park System has encouraged the use of geocaching because of its low-risk and high-return of getting more visitors to explore the woods. Essentially, the campaign’s main purpose was to attract more tourists to Arkansas. Due to the large success, over 125 hits in the first week, the Arkansas State Park System created a special
page dedicated to geocachers with a convenient worksheet to keep track of caches that they find within the parks (Gillin & Gillin, 2010). PPL Corporation, an energy company in Pennsylvania, wants visitors to see how an energy company can still produce electricity while being environmentally responsible and safe. PPL Corporation currently has six caches, one at each of its six preserves to entice customers to visit their wildlife refuges in Pennsylvania, Maine, and Montana. For the past two years, around 2500 finds have been logged at these six preserves. PPL Corporation also uses the geocaching game as a team-building activity for their employees. The employees work together in teams to find the geocaches. Communication, leadership, and strategy are just a few of the skills that geocaching has strengthen in the company’s employees (Gillin & Gillin, 2010).

II.3. AgCache

AgCache is a geocaching program that fosters the installation and promotion of geocaching sites that highlight the diversity, history, and/or importance of the Agricultural sector (Simms & Simms, 2010). This program was started in 2010 and, to date, has led to the establishment of six (6) agricultural-focused geocache sites in Virginia.

SECTION III: RESEARCH METHODS

III.1. Phase I: Existing AgCache Sites

In Phase I, the stakeholder group consisted of the AgCache creators, Chris and Jennie Simms, who have created three AgCache sites, and the creators of the three other existing AgCache sites. The creators of these sites and current site managers were interviewed to gain insight into the overall background, motivation, and logistics of the AgCache program.
This study gathered information from the two sources, the *AgCache* creators, and the managers of current *AgCache* sites. Information collected from the *AgCache* creators, addressed their motivation, start-up process of the *AgCache* program, requirements for potential *AgCache* sites, costs they experienced, and overall program goals. For the currently participating *AgCache* sites, the managers were asked questions regarding the process to establish a cache, what if any, operations changes were needed, visitor profiles, what, if any, benefit and costs they experienced, recommendations for future sites to host an *AgCache*, and about their overall *AgCache* experience.

**III.1.1. Survey Development and Distribution**

An in-depth interview was used to obtain the data from both groups. First, an initial set of questions was developed for the *AgCache* creators, Chris and Jennie Simms. Questions were checked for clarity and where needed, reworded to ensure appropriate interpretation. After editing, questions were ordered logically to facilitate fluid conversation. Prompts were added to several questions to ensure complete information was gathered. Open-ended questions were used to allow the *AgCache* creators to add further comments. The same design process was followed to create a separate open-ended interview guide for managers of current *AgCache* sites. These guides are presented in Appendices A-3 and A-4 respectively. Due to the small survey population, questionnaires were not pre-tested.

A phone interview was first conducted with the creators of *AgCache* to better understand the *AgCache* program. With permission of these participants, interviews were recorded. As a backup, hand-written notes of the interview were also taken. Recordings of the thirty-minute interview were transcribed, the transcriptions cleaned, and then
evaluated. An equivalent approach was adopted for the currently participating *AgCache* site managers.

**III.1.2. Data Analysis**

Once major themes were identified, a coding index was created for both surveys. Transcripts of both interview types were reviewed to identify emergent themes. These themes were added to those previously identified as needed to address research hypotheses. Emergent themes were identified by the prevalence of similar answers and repetition of identified categories based on the hypotheses, such as costs, benefits, visitors, and overall experience with the *AgCache* program.

**III.2. Phase II: Potential *AgCache* Sites**

In Phase II, the interest of agricultural sites in potentially hosting an *AgCache* was explored. For this study, a potential *AgCache* site was any agricultural-supporting organization, agricultural operations, petting zoos, agri-tainment sites, farming museums, and food processing facilities. The scope of this study is limited to Virginia.

**III.2.1. Survey Development and Distribution**

Open-ended and multiple choice questions were used to collect data through an electronically administered survey. Most questions were presented in a multiple choice format; however, an open-ended question format was selected when more in-depth information was needed. The questionnaire was designed to ask site managers questions regarding their operations’ demographics, current marketing techniques, knowledge of geocaching and the *AgCache* program, willingness to host an *AgCache* site, and overall opinion of agriculture’s role in the community. First, an initial set of questions were formulated to obtain answers in regards to willingness to participate in *AgCache* based on the operations’ demographics, knowledge of geocaching and *AgCache*, and current
marketing techniques. Where needed, questions were reworded for clarity and to ensure adequate interpretation, and ordered logically for fluid interpretation. Examples were added to several questions to ensure appropriate information was gathered. A total of thirty-four questions were prepared for the finalized questionnaire. This survey is presented in Appendix A-5.

To ensure questions were clear and correctly interpreted, the questionnaire was pretested at the North American Farmers’ Direct Marketing Association (NAFDMA) Conference in Williamsburg, Virginia in 2012. The sample consisted of forty-three agritourism organizations from the United States, Canada, and Europe. Once the surveys were completed, respondents were asked general questions in regards to interpretation of questions and ease of completion. The survey was edited and finalized using the input from this test group. The survey was then uploaded into an electronic survey software program, Qualtrics, for electronic distribution.

The population relevant to this study consisted of all Virginia-based agricultural-supporting organizations. This included any organization that was directly involved with or supported agriculture, and is located in Virginia. In respects to the sampling frame, due to the vast number of organizations that can qualify in the targeted population, compiling a complete population list was not possible. Therefore, agricultural networks in Virginia were contacted to distribute the survey to their members. The agricultural networks were sent a synopsis of the AgCache project and directions regarding distribution of the survey. Once the agricultural network agreed to distribution, a subsequent email to be forwarded to the network’s members was sent to the sponsor organization. Potential respondents were presented with a summary of the AgCache project, assurances of
confidentiality and that their participation is voluntary, researcher’s contact information, and a link to the survey. Additional information about the *AgCache* program and consent verification was included on the introduction page of the electronic survey. Virginia Farm Bureau Federation Young Farmers, Virginia Cooperative Extension, Virginia Department of Agriculture & Consumer Services, Farm Credit of Virginias, Virginia Farm Mentor Network, Virginia Agribusiness Council, Virginia Christmas Tree Growers Association, and Virginia Landscape & Nursery Association all agreed to assist. In addition, email addresses were collected for Virginia producers in the dairy, equine, organics, and winery industries as well as farm-stays, bed and breakfasts, farmers’ markets, and community supported agricultural networks.

### III.2.2 Empirical Model & Data Analysis

For this study, the model selected was an ordered probit model due the dependent variable’s choices, *Interest in Hosting an AgCache*, constructed on a Likert scale. The ordered probit model was consistent with the concept that the participant’s probability of hosting an *AgCache* site must be between zero and one. Therefore, OLS (ordinary least squares) model was not the appropriate method given that participants’ probabilities would never be less than zero or greater than one (Monson, Mainville, & Kuminoff, 2004). $Y_i*$ is the latent dependent variable, *Interest in hosting an AgCache* and is assumed to be a function of observed and unobserved variables (Evans, 2004).

The participants were given seven choices: *Not Interested, Slightly Interested, Somewhat Interested, Very Interested, Extremely Interested, Don’t Know, and Need More Information*. After initial descriptive statistics of the dependent variable, the original seven categories were collapsed into three main categories due to similarity in answer choices, distribution of responses, and no potential information loss. The finalized
categories were relabeled as follows: Level 1 Not Interested, Slightly Interested, and Don’t Know; Level 2 Somewhat Interested; Level 3 Very Interested, Extremely Interested, and Need More Information. Based on respondents’ feedback in the electronic survey, the options of Don’t Know and Need More Information were recoded into their new categories.

Below are the explanatory variables that were used to predict the probabilities of an organization reporting different levels of interest in hosting an AgCache.

\[ y_i^* = \beta_0 + \beta_1 \text{geo}_i + \beta_2 \text{male}_i + \beta_3 \text{billsigns}_i + \beta_4 \text{fliers}_i + \beta_5 \text{pr int adsNEWS}_i + \beta_6 \text{radio}_i \\
+ \beta_7 \text{socialmedia}_i + \beta_8 \text{telev}_i + \beta_9 \text{wordmouth}_i + \beta_{10} \text{email}_i + \beta_{11} \text{interernetpres}_i \\
+ \beta_{12} \text{industry}_i + \beta_{13} \text{agspend12}_i + \beta_{14} \text{agspend34}_i + \beta_{15} \text{agspend55}_i + \beta_{16} \text{activity22}_i \\
+ \beta_{17} \text{activity23}_i + \beta_{18} \text{activity24}_i + \beta_{19} \text{activity25}_i + \beta_{20} \text{activity26}_i \\
+ \beta_{21} \text{agcache}_i + \beta_{22} \text{agcacheALLactivity22}_i + \beta_{23} \text{agcacheALLactivity23}_i \\
+ \beta_{24} \text{agcacheALLactivity26}_i + \beta_{25} \text{visit}_i + \beta_{26} \text{activity22visit}_i \\
+ \beta_{27} \text{activity23visit}_i + \beta_{28} \text{activity24visit}_i + \beta_{29} \text{activity25visit}_i + \beta_{30} \text{activity26visit}_i \\
+ \beta_{31} \text{position}_i + \beta_{32} \text{partigeonev}_i + \beta_{33} \text{viab}_i + \beta_{34} \text{educate}_i + e \]  

(2.1)

Where

\[ y_i^* = \text{unobserved Interest in hosting and AgCache} \]

\[ y_i = 1 \text{ if } 0 \leq y^* < -0.464, \text{ designating Not Interested in hosting an AgCache} \]

\[ y_i = 2 \text{ if } -0.464 \leq y^* < 0.297, \text{ designating Somewhat Interested in hosting an AgCache} \]

\[ y_i = 3 \text{ if } 0.297 \leq y^*, \text{ designating Very Interested in hosting an AgCache} \]

More in-depth descriptions of the explanatory variables are located in Table 2.2 in Appendix A-6. The estimated threshold values or “cut-off points” (u₁, u₂) determine the expected interest of hosting an AgCache. The threshold parameters (-0.464 and 0.297)
are used to approximate the value of the index necessary to boost the participant to the next level of interest (Evans, 2004). The probability of a participant’s choice \((Y_i)\) being 1, 2 or 3 can be written as:

\[
\begin{align*}
Pr(Y_i = 1) &= 1 - \Phi(x_i\beta - (-0.464)) \\
Pr(Y_i = 2) &= \Phi(x_i\beta - (-0.464)) - \Phi(x_i\beta - (0.297)) \\
Pr(Y_i = 3) &= \Phi(x_i\beta - (0.297))
\end{align*}
\]

where \(\Phi\) is the cumulative normal distribution function (Lemieux, 2012). Estimation of the above threshold parameters is completed through the maximum likelihood procedure (Daykin and Moffatt, 2002). Unlike OLS, the coefficients from the ordered probit model cannot be directly interpreted; however, due to the study’s general focus of the overall AgCache program, the coefficients of the explanatory variables were interpreted in regards to their effects on the predicted probability of interest in hosting an AgCache.

**SECTION IV: RESULTS**

**IV.1. Phase I: AgCache Founders and Existing AgCache Sites**

The results from stakeholder group 1 were divided into two sub-groups: the AgCache creators, and the current AgCache sites interviewed. The two groups were separated for analysis due to the difference in topics.

**IV.1.1. AgCache Creators**

While interviewing, the creators of AgCache, Chris and Jennie Simms, there were three major themes appeared during the data analysis stage. These three themes consisted of: motivation for starting the AgCache program, goals for the AgCache program, and constraints to expansion of the AgCache program. Concerning their motivation, Chris and
Jennie Simms wish to promote agriculture in a positive perspective through their
AgCache program. AgCache was recognized and awarded the 2010 American Farm
Bureau Award. In selecting potential AgCache host sites, Chris and Jennie noted that
“We want to make sure that if we're dealing with somebody that, that we have
something there; that they're living up to certain standards. They're following the
correct animal husbandry standard…so that it's a presentable operation.”
The hope of AgCache is to bring people of agriculture and non-agricultural backgrounds
together.

The Simms family started geocaching as a hobby several years ago, and their goal
for the AgCache program is to set geocaches in agricultural settings in order to bring
urban and other non-agricultural visitors to the rural areas. The AgCaches are listed on
the Simms’s website “Agtually,” which also includes blogs, recipes, and agricultural
news. Chris noted that “we do all the website stuff ourselves.”

Currently, Chris and Jennie visit all the potential sites before the set-up process
occurs. The cache set-up is completed onsite and is then activated virtually through
geocaching.com. Because the AgCaches are designed to be located on working
operations, the Simms created a “warnings statement” which is published on the
Agtually.com and geocaching.com websites to inform the visitors to only visit during
operating hours. The Simms notify visitors of the Virginia Agritourism Law, which
assigns no liability for injury or death to the AgCache site managers. All of the costs for
establishing the AgCaches are presently compensated for by the Simms. Presently there is
no monetary cost to sites to join the program.
The long term goal of AgCache is to have a cache in every agricultural sector in every US state. The Simms recognize this goal is extremely optimistic. For the short term, they would like to add ten AgCaches per year to the program. Even with this goal, Jennie mentioned the theme of expansion constraints by stating that they “are having a hard time trying to figure out how to get more and more of [the caches] set up.” Without having employees and both Chris and Jennie working full-time jobs, they find it difficult to find time to travel to set up new AgCache sites.

IV. 1.2. Site Managers

Site managers were interviewed through an in-depth telephone interview. Participants’ identifications and detailed interview transcriptions are presented in Appendices A-7, A-8, A-9, and A-10. Once permission was granted from the site manager, the interview was recorded and transcribed for relevant themes in accordance to the research hypotheses. Hand written noted were also taken. Emergent themes were associated with the site managers’ experiences with AgCache. The specified themes identified are located in Table 2.3.

**Table 2.3: Main Themes Identified in Current AgCache Sites Responses**

<table>
<thead>
<tr>
<th>Main Themes</th>
<th>Benefits to the AgCache Program</th>
<th>Drawbacks to the AgCache Program</th>
<th>Relationship between AgCache Implementation and Business’s Growth</th>
<th>Overall Recommendation of AgCache Program to Potential Sites</th>
</tr>
</thead>
</table>

The first main theme expressed were the benefits associated with the AgCache program. One of the factors identified towards the beginning of the interview was the lack of expense associated with joining the AgCache program. Especially during hard economic times, agricultural organizations do not have additional income. Therefore,
using *AgCache* as a free marketing tool for an agricultural operation provides unique advertising technique for the cache host. All three current *AgCache* sites confirmed no additional costs were associated with joining the *AgCache* and even no additional cost to them “for the box that [the cache] is hidden in” according to Participant 3.

Another benefit associated with the *AgCache* program is the types of visitor attracted to these sites. All three site managers stated that the majority of visitors are mostly local residents with few tourists from outside the area. This type of local visitor can bring enormous benefits to the agricultural operations that hosting the *AgCache* program. Not only do the local visitors live in the area and can easily return to the site, but they also have the potential to recommend the site to other local residents as well as visiting family and friends. This publicity can increase the amount of visitors to the operations as well as enhance community building. Participant 1 stated that he doesn’t “really get to talk to the visitors much but from the ones [he does] they are from the area.” Participant 3 also added that their visitors are “several [from] the area. A few locals.” Participant 2 confirmed that his visitors are “a little bit of everything; some local and some traveling through.” The prevalence of local visitors emphasizes that the majority of visitors have the potential to easily return to the *AgCache* site and essentially recommend the agricultural operation to others within the area. Word-of-mouth is a powerful advertising tool for agricultural-supporting operations, and the *AgCache* program can be an additional marketing tool for assisting in the advertising. However, it is important to note that the type of visitor may differ for potential sites given the primary activity of the host site.
As well, the benefit of a small time commitment was also mentioned in the interviews. Participant 3 stated that “only thing you have to do is call for a new log book when it’s full. But doesn’t require any day-to-day time.” Participant 2 had a similar experience but mentioned that no time was required at his business. Participant 1 did not clearly mention the time requirement but stated that their AgCache was uploaded “on the site within a few weeks.” The small time commitment allows for site managers to focus on the main activities of their business instead of being distracted by the requirements of hosting an AgCache.

AgCache site managers were also questioned about potential drawbacks of the AgCache program. Overwhelmingly, all three AgCache sites confirmed that one of the main benefits to the AgCache program was no drawbacks from participation. None of the AgCache sites reported any constraints to the implementation of the AgCache. All site managers stated that Chris and Jennie visited their site and setup the AgCache. Overall, the process was generally simple and easy according to the site managers.

One potential drawback was, however, identified. Participant 1 noted the potential issue of visits during off-hours. It is vital for the business to be open almost every day; however, visitors coming to the operation during off hours or off season can pose potential risks for the operation. For some types of sites, safety and liability issues could become drawbacks to joining the AgCache program if not handled properly. The AgCache program has attempted to address this concern. As expressed by Participant 1, he was “just concerned about people coming onto the property during off hours. But Chris and Jennie made sure to list the times to come by and stated that this is a live operation on the website.” As well, Participant 3 expressed that “at the beginning, people
came when we were not open so we had problems with that. But eventually since the web site stated to only come during specific hours, we resolved that.”

Next, the potential relationship between implementation of the AgCache and the host site’s revenue was analyzed. A direct correlation between the implementation of the AgCache and the increase in the business’s growth could not be verified, and as such, Participant 1 and Participants 2’s businesses are continuous growing each year, a direct correlation could not be confirmed. Participant 3 mentioned no evident increase in agritourism in the area; he did, however, note that agritourism remains “strong in the area.” Regardless of the correlation, all three current sites have not seen any decreases in frequency of visitors or revenues since the implementation of the AgCache.

Lastly without positive endorsement, the AgCache program would not be able to continue to add new sites. Current site managers expressing enthusiasm to recommend the program to other agricultural-supporting operations is essential for AgCache’s future; therefore the overall recommendation is vital. When asked the question ‘would you recommend AgCache to other operations that are considering joining’, all site managers answered excitingly, “Absolutely,” “Yeah,” and “Sure.” These positive recommendations not only help the image of the AgCache program but can also persuade potential AgCache sites to join the program.

IV.2. Phase II: Potential AgCache Sites
The potential AgCache sites consisted of various agricultural operations, wineries, bed and breakfasts, farmers’ markets, and agricultural lending institutions. A total of 254 responses were collected from potential AgCache sites.
IV.2.1. Descriptive Statistics

After developing the hypotheses and selecting potential significant explanatory variables, the final sample size totaled 184 observations. Table 2.4 illustrates the distribution of potential AgCache sites based on primary activity. The majority of potential AgCache sites were engaged in only crop production. Operations were categorized based on their answer to choice and open-ended responses. Overall, the distribution of activity type is shown in Table 2.4.

Table 2.4: Primary Activity of Potential AgCache Sites

<table>
<thead>
<tr>
<th>Primary Activity</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Processor</td>
<td>18</td>
<td>9.47</td>
<td>9.47</td>
</tr>
<tr>
<td>Retailers</td>
<td>37</td>
<td>19.47</td>
<td>28.94</td>
</tr>
<tr>
<td>Service Providers</td>
<td>32</td>
<td>16.84</td>
<td>45.78</td>
</tr>
<tr>
<td>Livestock Producers</td>
<td>26</td>
<td>13.68</td>
<td>59.46</td>
</tr>
<tr>
<td>Crop Producers</td>
<td>44</td>
<td>23.16</td>
<td>82.62</td>
</tr>
<tr>
<td>Mixed Ag. Producers</td>
<td>33</td>
<td>17.37</td>
<td>100.00</td>
</tr>
</tbody>
</table>

For the dependent variable, an overwhelmingly majority of respondents expressed some type of interest in hosting an AgCache. Roughly 70 percent of responses were either somewhat or very interested in becoming a host (Table 2.5). Over half of the respondents reported prior knowledge of geocaching before taking the survey as seen in Table 2.6. As well in Table 2.6, the majority of respondents had no prior knowledge of the AgCache program prior to the survey. With regard to gross income, roughly 23% of respondents opted to not respond; due to the significant number of missing observations, and statistical insignificance of the responses, the variable, gross, was not included in the model. For internet access, 98% of respondents indicated that they have internet access. Not surprisingly then, this variable was not statistical significant in influencing the level of interest in hosting an AgCache, and as such, was not included in the model. For the visit variable, an extreme negative significant coefficient was estimated. This surprising...
result was explored by generating an interaction term between the *visit* and “primary activity” (i.e. crop production) variables to see if the combination of a respondent’s activity and visiting customer base influenced the level of interest. Further explanation of the new interaction terms is in the Section IV.2.2. Lastly, advertising channels were included in the model. Some advertising channels (e.g. billboards and signs, and newspaper and telephone ads) were combined into new variables, *billsigns* and *printadsNEWS*, due to similarity in communication methods and lack of observations.

Table 2.7 summarizes the descriptive statistics of the examined advertising channels.

**Table 2.5:** Interest in Hosting an *AgCache*

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Interested</td>
<td>52</td>
<td>28.26</td>
</tr>
<tr>
<td>Somewhat Interested</td>
<td>38</td>
<td>20.65</td>
</tr>
<tr>
<td>Very Interested</td>
<td>94</td>
<td>51.09</td>
</tr>
</tbody>
</table>

**Table 2.6:** Frequency of Geocache and *AgCache* Knowledge

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geocache</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>79</td>
<td>42.93</td>
</tr>
<tr>
<td>Yes</td>
<td>105</td>
<td>57.07</td>
</tr>
<tr>
<td><em>AgCache</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>172</td>
<td>93.48</td>
</tr>
<tr>
<td>Yes</td>
<td>12</td>
<td>6.52</td>
</tr>
</tbody>
</table>

**Table 2.7:** Frequency of Advertising Channels

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billboards &amp; Signs</td>
<td>85</td>
<td>14.36</td>
</tr>
<tr>
<td>Fliers</td>
<td>68</td>
<td>11.49</td>
</tr>
<tr>
<td>Newspaper &amp; Telephone</td>
<td>75</td>
<td>12.67</td>
</tr>
<tr>
<td>Radio</td>
<td>31</td>
<td>5.24</td>
</tr>
<tr>
<td>Social media</td>
<td>123</td>
<td>20.78</td>
</tr>
<tr>
<td>Television</td>
<td>10</td>
<td>1.69</td>
</tr>
<tr>
<td>Word of Mouth</td>
<td>160</td>
<td>27.03</td>
</tr>
<tr>
<td>Email</td>
<td>11</td>
<td>1.86</td>
</tr>
<tr>
<td>Internet Use</td>
<td>20</td>
<td>3.38</td>
</tr>
<tr>
<td>Industry Associations</td>
<td>9</td>
<td>1.52</td>
</tr>
</tbody>
</table>
IV.2.2. Empirical Model Results

Ordered probit estimation results are presented in Table 2.8. The variables of *fliers, telev, email, adspend34, activity22, agcache, and partigeonew* were statistically significant (at p < 0.05) in influencing the level of interest in hosting an *AgCache*. The variables of *internetpres* and *position* were statistically significant at the 0.10 significance level.

Dummy variables were used to indicate the classification of the responding firm’s activity. Due to the mutually exclusive variable, the baseline activity used in this model was *activity21*, or an agricultural processor. With an adequate distribution and even proportionality of the activity categories, the baseline activity chosen was at the researcher’s discretion. At the 0.05 significant level, retailers (*activity22*) were statistically more interested in hosting an *AgCache* than an agricultural processor. Service providers to farmers, livestock producers, crop producers, and mixed agricultural producers were not statistically significant in being more interested in hosting an *AgCache* than an agricultural processor. This result is somewhat surprising since crop and mixed agricultural producers’ primary activities are usually associated with customer visits. However, livestock producers insignificant result was not surprising given that agricultural processors and livestock producers generally do not have primarily activities with an open customer visitation. As well, the potential food safety risks and liability concerns associated with these operations usually dissuade site managers from allowing visitors on the premises. These results pertaining to primary activity are relevant by providing key information that could assist the *AgCache* producers with marketing the *AgCache* program to specific agribusinesses.
For the explanatory variable visit, the initial hypothesis was that agribusinesses that already have visiting customers would be more interested in hosting an AgCache. When the visit variable was included in the initial model versions, however, the result was a statistically insignificant coefficient. Due to this unexpected result, the visit variable was further analyzed in conjunction with activity. This new interaction terms, activity*visit were created to see if the level of interest in AgCache was influenced by the intersection of activity and customers visiting the physical location of the agribusiness. Even with a visiting customer base and specific type of activity, none of the agribusinesses’ levels of interest were different than that of an agricultural processor. These results seem unusual given literature backing and previous studies; these particular agribusinesses interest in receiving additional visitors to their businesses’ sites is not influenced even with an existing visiting customer base.

Prior knowledge of the geocaching game was hypothesized to increase the interest of hosting an AgCache site. Based on the results, geocaching knowledge is not statistically significant in influencing the level of interest in hosting an AgCache. This was a surprising result given that AgCache is a subset of the game of geocaching. Given the usual positive reaction to geocaching, prior knowledge of the AgCache program was hypothesized to increase the interest in hosting an AgCache. When the variable was included in the initial trials, an extreme negative statistically significant coefficient was calculated at the 0.01 significance level. To explore this further, new interaction variables were created, AgCache*ALLactivity, analyzed the influence of the interaction between firm activity and knowledge of the AgCache program. The results showed that despite type of activity and prior knowledge of AgCache, these agribusinesses’ levels of interest
were not different than that of an agricultural processor. However, it is unknown how these particular producers obtained information about the AgCache program. Misinformation about the program through word of mouth may be a key component as to why respondents are still not interested in hosting. Currently, the amount of marketing for the AgCache program has been minimal.

For the advertising channels, email was found statistically significant at the 0.01 level while fliers and television were statistically significant at the 0.05 level. Another advertising channel, internet use (internetpres) was found statistically significant at the 0.10 level. An agribusiness using these particular advertising channels will be more interested in hosting an AgCache. Billboards and signs (billsigns), word of mouth (wordmouth), print ads (printadsNEWS), radio ads (radio), industry associations (industry) and social media (socialmedia) were not statistically significant. After analyzing all the advertising techniques, fliers and email seemed relatively normal to be statistically significant given these techniques are inexpensive like the AgCache program. For television, this significant coefficient was surprising given the expense of this advertising technique. However if the respondent is willing to pay for an advertising technique like a television ad, then a free advertising technique like AgCache would seem very attractive to this respondent. Unusually, social media and word of mouth were not statistically significant in the model given these methods are free marketing techniques like AgCache. Nonetheless, word of mouth and social media were the top marketing techniques and both obtained an enormous proportion of the advertising channels distribution. These high distributions resulted in their insignificance to the model.
After the hypotheses variables were added into the model, other explanatory variables were included to investigate their impact on influencing the level of interest in hosting an AgCache. One additional variable added to the model was the amount of revenue spent on advertising (adspend). Three levels were considered. Of the three levels, an agribusiness with advertising spending from $1,000 to $10,000 (adspend34) was statistically significantly less interested in hosting an AgCache at the 0.05 significance level. These agribusinesses may be less interested in hosting an AgCache because they are spending revenue on other advertising channels. This information was also vital in regards to providing information for the AgCache creators about potential fees charged to participating AgCaches. Position in the agribusiness was also included in the model. This dummy variable was recoded as 1=senior level management/owner, 0 = lower level of management. At the 0.10 significance level, senior level management/owner was statistically significant to be more interested in hosting an AgCache. This result is not surprising given that senior level managers and owners are usually the decision-makers for new business or marketing ventures and have the most incentive to be innovative. As well, if an agribusiness knew of someone who had participated in geocaching (partigeonew), then that agribusiness was statistically significant to be more interested in hosting an AgCache at the 0.05 significance level. This result is expected given that the AgCache program is based on the game of geocaching. Two additional variables measuring respondents’ opinions on agriculture were also included. The first variable, viab, asked the respondents to rate how important they felt agriculture is to the viability of rural communities. The second variable, educate, asked respondents if it is the responsibility of an individual agribusiness to educate the
public about agriculture. Both variables were not statistically significant, illustrating that an agribusiness does not connect the AgCache program to sustaining the viability of rural areas or aiding in the education of agriculture. However, the majority of respondents agreed that agriculture sustains rural areas’ viability (97%), and it’s the individual agribusiness’s responsibility to educate the public on agriculture (85%). These results can provide vital information for the AgCache creators for future site recruitment efforts. For instance, connecting the AgCache program as an educational tool as well as a rural viability strategy can not only recruit more potential sites but also spread a positive image of the AgCache program.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geocache</td>
<td>0.1401</td>
<td>0.2467</td>
</tr>
<tr>
<td>Male</td>
<td>0.3372</td>
<td>0.2391</td>
</tr>
<tr>
<td>Billboards &amp; Signs</td>
<td>-0.1460</td>
<td>-0.2444</td>
</tr>
<tr>
<td>Fliers</td>
<td>0.5414**</td>
<td>0.2523</td>
</tr>
<tr>
<td>Newspaper &amp; Telephone</td>
<td>0.0916</td>
<td>0.2836</td>
</tr>
<tr>
<td>Radio</td>
<td>0.5181</td>
<td>0.3527</td>
</tr>
<tr>
<td>Social media</td>
<td>0.2220</td>
<td>0.2402</td>
</tr>
<tr>
<td>Television</td>
<td>1.4812**</td>
<td>0.7456</td>
</tr>
<tr>
<td>Word of mouth</td>
<td>0.2709</td>
<td>0.3655</td>
</tr>
<tr>
<td>Email</td>
<td>1.7366***</td>
<td>0.6465</td>
</tr>
<tr>
<td>Internet Use</td>
<td>0.6113*</td>
<td>0.3589</td>
</tr>
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<td>Industry</td>
<td>-0.6128</td>
<td>0.4865</td>
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<td>Advertise Spending (Under $1,000)</td>
<td>0.1328</td>
<td>0.3123</td>
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<tr>
<td>Advertise Spending ($1,000-$10,000)</td>
<td>-0.8155**</td>
<td>0.4059</td>
</tr>
<tr>
<td>Advertise Spending (Over $10,000)</td>
<td>-0.1623</td>
<td>0.4907</td>
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<tr>
<td>Retailers</td>
<td>0.7637**</td>
<td>0.3805</td>
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<td>Service Providers</td>
<td>6.0254</td>
<td>435.69</td>
</tr>
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<td>Livestock Producers</td>
<td>4.3185</td>
<td>435.69</td>
</tr>
<tr>
<td>Crop Producers</td>
<td>6.3324</td>
<td>435.69</td>
</tr>
<tr>
<td>Mixed Ag. Producers</td>
<td>7.0115</td>
<td>435.69</td>
</tr>
<tr>
<td>Heard of AgCache</td>
<td>-2.0798***</td>
<td>-2.72</td>
</tr>
<tr>
<td>Retailers who heard of AgCache</td>
<td>1.2220</td>
<td>1.1551</td>
</tr>
<tr>
<td>Service providers who heard of AgCache</td>
<td>-1.3401</td>
<td>1.6503</td>
</tr>
<tr>
<td>Livestock producers who heard of AgCache</td>
<td>-5.2435</td>
<td>385.49</td>
</tr>
<tr>
<td>Crop producers who heard of AgCache</td>
<td>7.1398</td>
<td>467.14</td>
</tr>
<tr>
<td>Visiting Customer Base</td>
<td>5.1184</td>
<td>435.69</td>
</tr>
<tr>
<td>Service providers with visiting customer base</td>
<td>-6.3690</td>
<td>435.69</td>
</tr>
<tr>
<td>Livestock producers with visiting customer base</td>
<td>-4.4790</td>
<td>435.69</td>
</tr>
<tr>
<td>Crop producers with visiting customer base</td>
<td>-6.4302</td>
<td>435.69</td>
</tr>
<tr>
<td>Mixed ag. producers with visiting customer base</td>
<td>-6.8810</td>
<td>435.69</td>
</tr>
<tr>
<td>Position in Agribusiness</td>
<td>0.6286*</td>
<td>0.3343</td>
</tr>
<tr>
<td>Know Geocache Participant</td>
<td>0.6057**</td>
<td>0.2973</td>
</tr>
<tr>
<td>Viability to Rural Areas</td>
<td>-0.3700</td>
<td>0.6420</td>
</tr>
<tr>
<td>Educate about Agriculture</td>
<td>-0.2320</td>
<td>0.1889</td>
</tr>
</tbody>
</table>

Notes: *p<0.10, **p<0.05, ***p<0.01; n = 184
Baseline: Agricultural Processor with no Advertise Spending
Dropped due to collinearity: Activity22visit, AgCacheALLactivity26
SECTION V: CONCLUSIONS

V.1. Key Findings

The AgCache program has seen steady growth within its short time of operation. As of May 2013, the program had six active AgCache sites in Virginia with potentially more sites being added. Surprisingly, potential site managers have been contacting the Simms to join the program, which has made Chris and Jennie’s work easier in regards to recruiting for potential sites. Chris and Jennie Simms expressed that more sites would be available on their website; however, the time and traveling required to set up the potential sites has been their biggest challenge. Due to the time constraints, The Simms are still in the process of creating marketing materials and informational packets to be distributed through extension resources and the AgCache website. As well, Chris and Jennie have experienced the challenge of potential sites being denied after the work has been completed. Geocaching.com does not allow geocache sites to be within 0.10 miles of each other.

With positive experiences from current AgCache sites, the hope of the AgCache program is to expand its future sites into other agricultural venues. According to the quantitative results, agribusinesses that are currently involved in retailing are more likely to be interested in hosting an AgCache in comparison to agricultural processors; however, if the agribusiness has heard of the AgCache program, then the agribusiness may be hesitant in joining the program. Due to the minimal amount of marketing, it is uncertain of how respondents heard about the AgCache program prior to the survey. Misinformation may be a key component in explaining the extreme negative impact previously hearing about AgCache had on respondent’s interest in hosting an AgCache.
Hopefully with new informational packets and marketing materials being distributed shortly, these sites will be more interested and better informed about hosting an *AgCache*. Potential marketing techniques for the *AgCache* program can be established from the quantitative results. Specifically, continued efforts need to be made in regards to advertising the *AgCache* program as an educational marketing tool and rural viability strategy. As well, the *AgCache* needs to have a strategic marketing plan with *Geocaching.com*. Perhaps, advertising an established partnership with *Geocaching.com* could potentially become a fundamental marketing technique for the *AgCache* program to obtain more agricultural sites. As well, respondent demographic characteristics can provide valuable information for potential marketing techniques. For instance, marketing materials developed for a primary owner or manager who is more likely to be interested in hosting an *AgCache* site. Furthermore if the *AgCache* creators decide to establish a fee for participating in the program, this study recommends caution in the decision-making process for establishing the proposed fee, especially since the *AgCache* program is currently based on a “no-fee” set-up.

**V.2. Study Limitations**

Three of the six sites are currently being managed by Chris and Jennie Simms; therefore information in regards to customers and visitations due to *AgCache* were not available from site managers. Also since *AgCache* is a relatively new venture, many participants have not experienced all possible benefits or drawbacks from participating in the program. Further, many of the current *AgCache* sites are new business with only a few years of experience; therefore, the site managers cannot confirm specific benefits gained from the *AgCache* program.
V.3. Recommendations for Future Research

Agritourism is influenced not only by agriculture but also tourism trends. An estimated 62 million Americans visited farms one or more times between 2000 and 2001 (Barry & Hellerstein, 2004). Assuming that each visit was by a different person, this equates to almost 30% of the total US population. Prior to 2000, most of these visitors took between 1 to 5 trips to a farm in previous years. One reason for the increase in farm visits was the public’s demand for outdoor recreation, which has been steadily increasing due to higher amounts of discretionary income. “Trends and future projections indicate continued increases in the number of participants, trips, and activity days for outdoor recreation as well as the increase of multi-activity but shorter trips” (English, Cordell, & Bowker, 1999). This estimate does not include children below 16 years of age, which is estimated at an additional 20 million (Wilson, Thilmany, & Sullins, 2006).

There is evidence of growing support for local farmers through consumer attitudes about local foods, such as their willingness to pay a premium for in-state products (Martinez, 2010). This support provides an “important outlet for local farmers while enhancing communities and providing consumers a wider variety of choices and greater access to local farm production” (NASDA, 2013). As a result of the heightened demands in agricultural production, and increases in traveling and support for local farmers, agritourism has the potential to continue providing alternative income for farmers into the future.

With the promising future of agritourism, the next step in conducting research for this study would be interviews with potential sites to investigate the methods in which agribusinesses are hearing about the AgCache program given the current limited advertising. This information could be helpful in explaining why certain agribusinesses
may be hesitating in hosting an AgCache. Another future study could investigate the
demographic characteristic of age on the level of interest in hosting an AgCache. This
characteristic could be a valuable insight for the AgCache creators with future marketing
strategies. Also, future research could investigate the potential supply of AgCaches in
different states across the US. As mentioned earlier, the long-term goal of the AgCache
founders is to have an AgCache in every agricultural sector in every state.

Furthermore, the demand side of an AgCache program could be analyzed to
discover what potential markets the AgCache program could penetrate. Various
geocachers or agricultural enthusiasts could be surveyed to better understand their
preferred characteristics of an AgCache site, as well as their willingness to travel to, and
buy products at these sites. The data collected could be vital to future advertising
techniques for the AgCache program as well as to the individual site managers in hopes
of tapping into the potential customer base for AgCache sites.

V.4. The Future of AgCache

Even as a small, upcoming program, AgCache has the potential to help Virginia’s
agribusinesses, agriculture-supporting organizations, as well as greatly increase the
awareness of the agricultural community. Not only does the program encourage
agritourism, but also provides a potential advertising vehicle to young and upcoming
farmers in Virginia. The AgCache program, however, needs to be continuously
publicized; developing and distributing marketing materials and informational packets
will hopefully help in these efforts. But most importantly for the continued growth of the
AgCache program, currently participating AgCache sites must be willing to share their
beneficial stories to potentially interested agribusinesses. With shared feedback from
current sites, recruitment efforts should not only be focused in Virginia but in other states across the US.
REFERENCES


Detre, J.D., Mark, T.B., Mishra, A.K., & Adhikari, A. (2010). Linkage Between Direct


APPENDICES

Appendix A-1: Research Hypotheses

Hypotheses of this study are focused on the current potential AgCache sites. The study investigates two specific sets of testable hypotheses. The first set is focused on the current AgCache sites. It is hypothesized that current AgCache sites will see additional benefits, such as increases in visitors and revenues since the implementation of an AgCache. As well, this study hypothesizes that the current AgCache sites will recommend the program to similar agricultural organizations since the current host sites have not withdrawn from the program.

In terms of the potential AgCache sites, the study’s testable hypotheses predict that potential AgCache site owners with the following characteristics would be more interested in participating in the AgCache program: internet access, lower annual gross sales, customers who visit the site of operations, prior knowledge of AgCache and geocaching, and advertising techniques used such as email, social media, and word of mouth.

Internet access: According to Detre, Mark, Mishra, & Adhikari (2010), agricultural producers who have access to the internet are more likely to adopt other marketing techniques. This study assumes that if the respondents have internet access then they will be more likely to participate in a marketing technique such as AgCache.

Lower annual gross sales: Monson, Mainville, and Kuminoff (2008) found that reliance on direct marketing techniques decreases as farm size increases. This study
assumes that larger farms have higher annual gross sales, and as result, lower reliance on direct marketing and advertising techniques such as *AgCache*.

Customers who visit the site of operations: Furthermore, it is anticipated that potential sites will be more interested in hosting an *AgCache* site if they have customers who directly visit their physical location before the implementation of an *AgCache*. According to Starr et al., (2003), directing marketing technique farmers are more interested in customers with whom they can have “direct contact on a daily basis;” therefore, we assume that the agricultural organizations who already have direct contact with their customers will be more interested in hosting an *AgCache*.

Prior knowledge of *AgCache* and geocaching: In addition, prior knowledge of the geocaching and *AgCache* program could influence a host site’s interest in participation. The study hypothesizes that potential sites will more interested in hosting an *AgCache* site if they have prior knowledge of geocaching and/or the *AgCache* program. In the Bell, Roberts, English, and Park (1994) study, respondents’ interests in participating in the Tennessee Forest Stewardship Program was based upon their prior knowledge and attitude about the program.

Advertising techniques: Use of advertising techniques can influence a potential site’s interest in participating in marketing technique such as the *AgCache* program. Park, Mishra, and Wozniak (2011) stated that farmers are continuing to face increasing pressures and therefore must continue to diversify their various marketing channel portfolios. As such, this study will assume that farmers who participate in diversified advertising channels will continue to diversify their advertising channels and be more interested in participating in the *AgCache* program.
### Appendix A-2: Table 2.1: Most Popular Types of Geocaches

<table>
<thead>
<tr>
<th>Types of Geocache</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>This is the original geocache type consisting of, at minimum, a container and a log book or log sheet. Larger containers generally include items for trade.</td>
<td>Any location i.e. Main Street, Christmas Tree Lane, Meditation Pond, etc.</td>
</tr>
<tr>
<td>Multi-Cache (Offset)</td>
<td>A Multi-Cache (&quot;multiple&quot;) involves two or more locations. The final location is a physical container.</td>
<td>A stroll through a park: decoding the coordinates to see seven different spots in an Alabama Park.</td>
</tr>
<tr>
<td>Project A.P.E</td>
<td>Each cache represented a fictional story in which scientists revealed an Alternative Primate Evolution. These caches were made using specially marked ammo containers.</td>
<td>°Relabeled as Traditional geocache.</td>
</tr>
<tr>
<td>Mystery/Puzzle</td>
<td>The &quot;catch-all&quot; of cache types. This form of geocache may involve complicated puzzles that you will first need to solve to determine the coordinates of the cache site.</td>
<td>Solve math problems to find coordinates.</td>
</tr>
<tr>
<td>Letterbox Hybrid</td>
<td>The letterbox owner has made their container both a letterbox and a geocache and posted its coordinates on Geocaching.com.</td>
<td>Decode the clue about the hidden cache (Nugget’s Cache) or follow a drawn map to the hidden cache. (Roo’s Runaway in Virginia).</td>
</tr>
<tr>
<td>Wherigo</td>
<td>Wherigo allows geocachers to interact with physical and virtual elements such as objects or characters while still finding a physical geocache container</td>
<td>Ashburn-Leesburg Ridealong.</td>
</tr>
<tr>
<td>Cache In, Trash Out</td>
<td>While searching for caches, geocachers collect litter along the trails and properly dispose of it.</td>
<td>California: Prep the Park and Paint the Park.</td>
</tr>
<tr>
<td>EarthCache</td>
<td>An EarthCache is a cache located at a site where people can visit to learn about a unique geoscience feature of Earth.</td>
<td>Boulder Creek Falls, Hornito Lava Formation, Mojave Desert</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Virtual*</td>
<td>A Virtual Cache is about discovering a location rather than a container.</td>
<td>Guinea Station: where General Stonewall Jackson died</td>
</tr>
<tr>
<td>Webcam*</td>
<td>These are caches that use existing web cameras placed by individuals or agencies that monitor various areas like parks or business complexes. The idea is to get yourself in front of the camera to log your visit.</td>
<td>Take picture of yourself at the pier in San Francisco and send to Sea Lion’s cam to obtain prize.</td>
</tr>
<tr>
<td>10 Years Event*</td>
<td>A special Event Cache type for events held April 30 - May 3, 2010 to celebrate 10 years of geocaching.</td>
<td></td>
</tr>
<tr>
<td>Locationless Event*</td>
<td>Instead of finding a hidden container, you locate a specific object and log its coordinates.</td>
<td></td>
</tr>
</tbody>
</table>

*Notes: No longer available for creation on geocaching.com.
°Relabeled as traditional geocache.
Source: [http://www.geocaching.com](http://www.geocaching.com)
Appendix A-3: AgCache Creators Interview Questions

1. Can you tell us about the background of AgCache?
2. What was your motivation for starting AgCache?
3. How long has AgCache been operating?
4. Do you have any one else assisting you with AgCache? (Paid or Volunteer)
   a. If so, in what capacity?
5. Do you see AgCache as being in competition with geocaching?
6. What qualities/characteristics do you look for in a potential site?
7. A. Can you describe the process from meeting with a potential site owner to finalizing their site on your webpage?
   B. Approximately how long does this process usually take?
8. What types of questions or concerns do potential site owners have with joining AgCache?
9. Have there been any cases where a site opted to not join?
   a. If so, what was their reasoning?
10. After getting the cache set, what do site managers expect from you?
11. What kind of feedback have you received from the site managers?
   a. Have there been any challenges with maintaining or adjusting the operation for AgCache site?
   b. What, if any, are the benefits experienced from participating with AgCache?
12. Do you have any formal or informal contract with each site?
   a. If so, what does it entail?
   b. What is the expected length of time each cache site will remain active?
13. Do you charge a fee to the sites for your advertising?
14. A. What have been your “out-of-pocket” expenses so far for general AgCache administration?
    (*Note: prompt for information on both actual expenses ($ values) and the types of expenses (ex: web support.))
15. What are your expenses for each site and what does it cover?
16. Do you have a benchmark of how many sites you want to add each year?
17. Do you have any short term goals?
18. What are your long term goals for AgCache?
19. This concludes our formal questions. Do you have anything else you would like to add? Have we missed anything?
Appendix A-4: Existing AgCache Sites Interview Questions

Name:
Type of Operation:
Location:
Date joined AgCache:

Introduction
1. Had you heard of geocaching prior to signing up for AgCache?
2. How did you hear about AgCache?

Implementation
3. What concerns or questions did you have before agreeing to join AgCache?
4. Can you describe the process you went through to get the AgCache site set up at your location?
5. Did you have to make and changes to your operation to accommodate AgCache?
   Prompt: Ask about schedule and hours of operation, physical layout such as gates.
6. What costs were associated with joining AgCache?
7. How much time have you had to implement with the service?

Visitors
8. What type of visitors do you get? For example individuals, couples, groups?
9. Do you know where they are from? Local? Instate? Out of state?
10. Do you have any idea of their prime motivation for visiting the site? Geocaching? Agritourism?
11. Have the visitors provided you with any direct feedback during or after their visit?
12. During what months do you get the most visitors?
13. Any sense of how many?
14. What day of the week is most popular for AgCache visitors?
15. How long do they generally stay during a visit?

Benefits to the Organization
16. When visitors come, do they purchase any products from your operation?
17. How many visitors per week would you estimate purchase goods?
18. For those that purchase goods, what is the average amount that they spend?
19. Are these visitors returning?
20. Have you experienced any other benefits from participating in AgCache? If so please describe.
21. Have you seen an increase in agritourism in your area since joining AgCache?

The AgCache Experience
22. What characteristics of AgCache do you like the best?
23. What if anything would you change?
   Prompt: Any draw backs to participating in AgCache?
24. Would you recommend AgCache to other operations that are considering joining?
25. That concludes our formal questions. Is there anything else you would like to add?
Appendix A-5: AgCache Potential Sites Survey

FOSTERING AGRITOURISM THROUGH AGCACHE

*Note: If you have already completed this survey, you do not need to fill it out again!

Introduction

1. In what state is your operation located?______________________________

2. What is the primary activity/type of your organization? (Check one)

- Agricultural Processing (NGO)
- Agricultural Production
- Financial Services
- Government
- Marketing Services
- Non-Government Organization
- Retailer
- Tourism/Recreational Services
- University Extension
- Wholesaler, Distributor, Logistics
- Other: ____________________

*If checked Agricultural Production ⇒ Continue to Question 3
*If check any other option (not Agricultural Production) ⇒ Skip to Question 6

3. If you are an agricultural producer, what types of production activities you are engaged. (Check all that apply)

- Livestock Activities
  - Cattle (Dairy/Beef)
  - Hogs/Pigs
  - Sheep or Goats
  - Horses
  - Poultry, Eggs
  - Aquaculture
  - Other: ____________________

- Crop Activities
  - Fruits, Berries, & Tree Nuts
  - Grain & Oilseed
  - Horticulture
  - Vegetables, Potatoes, Melons
  - Nursery, Greenhouse,
  - Other: ________________
Production & Marketing Practices

4. Through which channels does your operation currently sell its products? *(Check all that apply)*

- Community Supported Agriculture (CSA)
- Farmers’ Market
- Internet Sales
- Pick-Your-Own
- Roadside Stand
- Sell to Grocery Stores
- Sell to Restaurants
- Sell to Schools
- Sell to Hospitals and/or Long-Term Care facilities
- Other: ___________________________________________
- Other: ___________________________________________

5. Does your operation use any special production practices? *(Check all that apply)*

- Certified Organic
- Producer Organically but am not Certified
- Transitioning to Organic
- No-till or limited tilling
- Grass-fed
- Other: ___________________________________________
- Other: ___________________________________________

6. Through which marketing/promotional channels does your organization currently use to advertise its products? *(Check all that apply)*

- Billboards and/or signs
- Fliers and/or mailings
- Newspaper, telephone book, and/or other print ads
- Radio ads
- Social media (i.e. Facebook, Twitter)
- Television commercials
- Word of mouth
- Other: ___________________________________________
- Other: ___________________________________________
7. How much money does your organization spend on advertising and other promotional activities in a given year? (Check one)
   - None
   - $1.00 - $500
   - $501 - $1,000
   - $1,001 - $5,000
   - $5,001 - $7,500
   - $7,501 - $10,000
   - More than $10,000
   - I don’t know.

8. Does your organization have Internet access?
   - Yes
   - No

9. Does your organization have its own website?
   - Yes
   - No

10. Does your organization use any forms of social media (i.e. Facebook, Twitter, LinkedIn, etc.)?
    - Yes. Please note which one(s): ________________________________
    - No

Your Customer Visits

11. Do your customers visit the physical location of your operation?
    - Yes
    - No

   *If Yes ⇒ Continue to Question 12
   *If No ⇒ Skip to Question 19

12. Where are the majority of your customers drawn from?
    *(Check one)*
    - Immediate Vicinity (within 20 miles)
    - Local Area (within 100 miles)
    - Within own state
    - Own and bordering states
    - Other: ________________________________________________
13. During which months do the majority of your customers visit your site? (Your peak season; Check all that apply).
   - January
   - February
   - March
   - April
   - May
   - June
   - July
   - August
   - September
   - October
   - November
   - December
   - I Don’t Know.

14. During your peak season, how many people visit your organization’s location in an average month?
   Approximately ________________ visitors per month.

15. When customers visit your operation, do they purchase any products or services?
   - Yes
   - No

   If Yes ⇒ Continue to Question 16
   If No ⇒ Skip to Question 19

16. Approximately, what percent of customers purchase products or services? (Place an “X” at the appropriate spot on the line)

   Percent (%) of customers who make purchases

17. What are the primary products or services that customers purchase at your site? (Check all that apply)
   - Raw agricultural goods (e.g. produce, eggs)
   - Value-added products (e.g. jams, jellies, floral arrangements)
18. How much does an average customer spend during their visit?
$________________________

Geocaching & AgCache

Geocaching is a modern “hide and seek” game where participants use a GPS device to locate hidden locations called geocaches. Most geocaches are located in state parks, and cultural and historic sites. AgCache is a program established in Virginia specifically to promote agricultural geocaches. AgCache sites include the Virginia Farm Bureau, and the Southampton Agriculture and Forestry Museum. At present, the AgCache creators set up all the geocache sites and supply all needed materials. There are no costs to joining the AgCache program.

19. Had you heard of Geocaching prior to this survey?
   - Yes
   - No

20. Had you heard of AgCache prior to this survey?
   - Yes
   - No

   *If Yes, ⇨ Continue to Question 21
   *If No⇨ Skip to Question 22

21. How did you hear of AgCache? *(Check all that apply)*
   - Family
   - Internet
   - Friends
   - Social Media (i.e. Facebook, Twitter)
   - Coworkers
   - Other: _________________________
   - Business Professionals
22. Given your understanding of AgCache, how interested would your organization be in hosting an AgCache site? (Check one)

- [ ] Not at all Interested
- [ ] Slightly Interested
- [ ] Somewhat Interested
- [ ] Very Interested
- [ ] Extremely Interested
- [ ] I Don’t Know
- [ ] Need more Information

If at least “Somewhat Interested” ⇒ Continue to Question 23
If “Not at all Interested” or ”Slightly Interested” ⇒ Skip to Question 26

23. Given your understanding of AgCache, what features of this initiative are appealing?

______________________________________________

______________________________________________

______________________________________________

______________________________________________

24. What, if any, concerns would you have with establishing an AgCache on your site?

______________________________________________

______________________________________________

______________________________________________

______________________________________________

______________________________________________

25. Would your business be willing to donate any time or resources to establish an AgCache site at your operation?
(Check all that apply)

- Yes, donate time to set-up site (Approximately 30 minutes)
- Yes, donate resources (e.g. container, prize tokens)
- Yes, donate time to maintain site (e.g. checking container, changing log sheets; approximately 15 minutes per week)
- Yes, Other:

- No
- I don’t know

26. Is there any information or support that would increase your interest in potentially hosting an AgCache site? If so, please describe:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

About You

27. What is your position in your organization? (Check one).

- Senior Management
- Middle/Junior Management
- Administrative Staff
- Support Staff
- Hired Labor
- Intern/Volunteer
- Other:

28. How long have you been working at your organization? (Check one).

- Over 20 years
- 11-19 years
- 6-10 years
- 1-5 years
29. What is your approximate annual gross revenue of your organization? (Check one)
   - Less than $10,000
   - $10,001 - $50,000
   - $50,001 - $100,000
   - $100,001 - $250,000
   - $250,001 - $500,000
   - More than $500,000
   - I prefer not to respond

30. What is your gender?
   - Male
   - Female

31. Have you, or anyone you know well, ever participated in geocaching?
   - Yes
   - No
   - I don’t know

32. In your opinion, how important is agriculture to the viability of rural communities? (Check one)
   - Not at all Important
   - Slightly Important
   - Somewhat Important
   - Very Important
   - Extremely Important
   - I Don’t Know
   - No opinion

33. To what extent do you agree with the following statement: “It is the responsibility of an individual agribusiness to educate the public about agriculture? (Check one)
   - Disagree
   - Somewhat Disagree
   - Neither Agree nor Disagree
   - Somewhat Agree
   - Agree
   - I Don’t Know
   - No opinion
34. Do you have any further comments, suggestions or feedback?

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

Thank you for your participation!
## Table 2.2: Descriptions of Explanatory Variables

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geo</td>
<td>Dummy =1 if heard of geocaching prior to survey</td>
<td>0</td>
<td>1</td>
<td>0.571</td>
<td>0.496</td>
</tr>
<tr>
<td>Male</td>
<td>Dummy=1 if male</td>
<td>0</td>
<td>1</td>
<td>0.538</td>
<td>0.500</td>
</tr>
<tr>
<td>Fliers</td>
<td>Dummy=1 if use fliers as advertising channel</td>
<td>0</td>
<td>1</td>
<td>0.370</td>
<td>0.484</td>
</tr>
<tr>
<td>Radio</td>
<td>Dummy=1 if use radio ads as advertising channel</td>
<td>0</td>
<td>1</td>
<td>0.168</td>
<td>0.375</td>
</tr>
<tr>
<td>Socialmedia</td>
<td>Dummy=1 if use social media as advertising channel</td>
<td>0</td>
<td>1</td>
<td>0.668</td>
<td>0.472</td>
</tr>
<tr>
<td>Telev</td>
<td>Dummy=1 if use television ads as advertising channel</td>
<td>0</td>
<td>1</td>
<td>0.054</td>
<td>0.227</td>
</tr>
<tr>
<td>Email</td>
<td>Dummy=1 if use email as advertising channel</td>
<td>0</td>
<td>1</td>
<td>0.060</td>
<td>0.238</td>
</tr>
<tr>
<td>Internetpres</td>
<td>Dummy=1 if use another form of online method as advertising channel</td>
<td>0</td>
<td>1</td>
<td>0.109</td>
<td>0.312</td>
</tr>
<tr>
<td>Industry</td>
<td>Dummy=1 if use industry associations as advertising channel</td>
<td>0</td>
<td>1</td>
<td>0.049</td>
<td>0.216</td>
</tr>
<tr>
<td>Adspend12</td>
<td>Dummy=1 if advertising spending is $1.00-$1,000</td>
<td>0</td>
<td>1</td>
<td>0.484</td>
<td>0.501</td>
</tr>
<tr>
<td>Adspend34</td>
<td>Dummy=1 if advertising spending is $1,000-$10,000</td>
<td>0</td>
<td>1</td>
<td>0.207</td>
<td>0.406</td>
</tr>
<tr>
<td>Adspend55</td>
<td>Dummy=1 if advertising spending is over $10,000</td>
<td>0</td>
<td>1</td>
<td>0.109</td>
<td>0.312</td>
</tr>
<tr>
<td>Activity21</td>
<td>Dummy=1 if activity is agricultural processing</td>
<td>0</td>
<td>1</td>
<td>0.098</td>
<td>0.298</td>
</tr>
<tr>
<td>Activity22</td>
<td>Dummy=1 if activity is Retailer to Consumer</td>
<td>0</td>
<td>1</td>
<td>0.201</td>
<td>0.402</td>
</tr>
<tr>
<td>Activity23</td>
<td>Dummy=1 if activity is Services to Farmers &amp; Other</td>
<td>0</td>
<td>1</td>
<td>0.174</td>
<td>0.380</td>
</tr>
<tr>
<td>Activity24</td>
<td>Dummy=1 if activity is only livestock production</td>
<td>0</td>
<td>1</td>
<td>0.141</td>
<td>0.349</td>
</tr>
<tr>
<td>Activity25</td>
<td>Dummy=1 if activity is only crop production</td>
<td>0</td>
<td>1</td>
<td>0.239</td>
<td>0.428</td>
</tr>
<tr>
<td>Activity26</td>
<td>Dummy=1 if activity is both livestock and crop production</td>
<td>0</td>
<td>1</td>
<td>0.179</td>
<td>0.385</td>
</tr>
<tr>
<td>AgCache</td>
<td>Dummy=1 if heard of AgCache prior to survey</td>
<td>0</td>
<td>1</td>
<td>0.065</td>
<td>0.248</td>
</tr>
<tr>
<td>AgCacheALLactivity21</td>
<td>Interaction term between heard of AgCache prior to survey and activity21</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AgCacheALLactivity22</td>
<td>Interaction term between heard of AgCache prior to survey and activity22</td>
<td>0</td>
<td>1</td>
<td>0.011</td>
<td>0.104</td>
</tr>
<tr>
<td>Variable</td>
<td>Description</td>
<td>Coefficient 1</td>
<td>Coefficient 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AgCacheALLactivity23</td>
<td>Interaction term between heard of <em>AgCache</em> prior to survey and activity23</td>
<td>0.016</td>
<td>0.127</td>
<td></td>
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</tr>
<tr>
<td>AgCacheALLactivity24</td>
<td>Interaction term between heard of <em>AgCache</em> prior to survey and activity24</td>
<td>0.011</td>
<td>0.104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AgCacheALLactivity25</td>
<td>Interaction term between heard of <em>AgCache</em> prior to survey and activity25</td>
<td>0.011</td>
<td>0.104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AgCacheALLactivity26</td>
<td>Interaction term between heard of <em>AgCache</em> prior to survey and activity26</td>
<td>0.016</td>
<td>0.127</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visit</td>
<td>Dummy=1 if agribusiness has visiting customer base</td>
<td>0.848</td>
<td>0.360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity21visit</td>
<td>Interaction term between activity21 and if customers visit the physical location of the business</td>
<td>0.070</td>
<td>0.283</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity22visit</td>
<td>Interaction term between activity22 and if customers visit the physical location of the business</td>
<td>0.201</td>
<td>0.402</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity23visit</td>
<td>Interaction term between activity23 and if customers visit the physical location of the business</td>
<td>0.136</td>
<td>0.344</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity24visit</td>
<td>Interaction term between activity24 and if customers visit the physical location of the business</td>
<td>0.103</td>
<td>0.305</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity25visit</td>
<td>Interaction term between activity25 and if customers visit the physical location of the business</td>
<td>0.201</td>
<td>0.402</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity26visit</td>
<td>Interaction term between activity26 and if customers visit the physical location of the business</td>
<td>0.152</td>
<td>0.360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position</td>
<td>Dummy=1 if senior level management</td>
<td>0.783</td>
<td>0.414</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partigeonew</td>
<td>Dummy=1 if know of someone who participates in geocaching</td>
<td>0.250</td>
<td>0.434</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viab</td>
<td>Categorical=1,2,3, Opinion on agriculture supporting rural viability</td>
<td>2.96</td>
<td>0.242</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educate</td>
<td>Categorical=1,2,3, Opinion on the responsibility of individual agribusinesses to educate the public about agriculture</td>
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n = 184 observations
## Appendix A-7: Existing AgCache Sites Identification

<table>
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<tr>
<td>College Run Farms</td>
<td>Steve Berryman</td>
<td>Participant 1</td>
</tr>
<tr>
<td>Hethwood Market</td>
<td>Scott Sink</td>
<td>Participant 2</td>
</tr>
<tr>
<td>Cullipher Farms</td>
<td>Hunter Walsh</td>
<td>Participant 3</td>
</tr>
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</table>
Appendix A-8: Existing AgCache Site: Participant 1 Interview Transcript

Katie  Hi Steve?
Steve  Yes.
Katie  Hi. This is Katie DuBreuil. I'm the graduate student at Virginia Tech who is researching the AgCache program, and Chris and Jennie Simms recommended your site for the interview. I was wondering if you were available for the interview now?
Steve  Yes, that's fine.
Katie  Okay. I'm going to ask you about 25 questions, so the interview shouldn't take more than 30 minutes. So, do you have about 30 minutes to spare right now for the interview?
Steve  Ah, yeah. I don’t think it should take 30 minutes. (laughing) I’m sure it won’t but I just want to make sure I don’t keep you on the phone longer than I said.
Steve  Okay.
Katie  Okay my first question is what type of operation do you own?
Steve  We have a pick your own operation. It mainly is strawberries and pumpkins. It's a place where visitors can pick their own fruits and veggies.
Katie  And where are you located?
Steve  In Surry County.
Katie  Okay. And when did you join AgCache?
Steve  Umm, I’m not sure, but we were the first site that joined. I know it was in 2010. It's been about a year and a half since joining.
Katie  Okay. And had you heard of geocaching prior to signing up for AgCache?
Steve  I'd heard of it one time before. But I didn't know what it exactly was. I thought it was people looking for geographical survey markers the government had planted.
Katie  Okay. And how did you hear about AgCache?
Steve  Chris called and told me about it. And asked would I join and be the first site.
Katie  Okay. What concerns or questions did you have before agreeing to join AgCache?
Steve  Um, none really. We were just concerned about people coming on the property during off hours. But Chris and Jennie made sure to put the box out by the road and not near our buildings. As well, they listed the times to come by and stated that this is a live operation on the site.
Katie  Okay. Can you describe the process you went through to get the AgCache site set up at your location?
Steve  Yeah, ah Chris called and asked me to join. He and Jennie came out and set up the cache and then later it was added to the site.
Katie  Do you have to make any changes to your operation to accommodate AgCache?
Steve  None really. Just adding the box.
Katie  Okay. How big is your operation, and what hours are you open to the public?
Steve  We have about 40 acres, and our hours vary depending on the season.
Katie  Alright. What costs were associated with joining AgCache?
Steve  No costs for us.
Katie  Okay. How much time have you had to implement the service?
Steve: We've been with the service for a year and a half, and then we were on the site within a few weeks.

Katie: Okay. What type of visitors do you get? For instance, families, students…

Steve: ahh..families

Katie: Okay. Do you know where they come from? Local? Instate, Out of state?

Steve: Ahh..usually from the area. I don’t really get to talk to the visitors much but from the ones I do they are from the area.

Katie: Okay. Do you have any idea of their prime motivation for visiting the site? Geocaching? Agritourism?

Steve: Well, most of our customers are here for the pick your own produce. And the few visitors I have talk to who came to find the cache have said they didn't realize the operation was here.

Katie: Okay. Have the visitors provided you with any direct feedback during or after their visit?

Steve: They are glad to find a place where they can pick their own fresh veggies. Ah, I don’t really get to talk to many visitors. But I know there is some feedback on the website. That's where Jordan goes and checks to see what people are saying.

Katie: Okay. During what months do you get the most visitors?

Steve: Well, most of our visitors come during our open season. It's about a six month time frame.

Katie: And when is your open season?

Steve: It's from late April to October.

Katie: Okay. Do you have any sense of how many visitors come to your operation due to geocaching?

Steve: Ahh, I can't say for sure that the visitors come because of geocaching since I don’t really get to talk with many visitors.

Katie: Okay. What day of the week is most popular for AgCache visitors?

Steve: Well, most of our visitors come during the weekends.

Katie: Okay, and how long do they stay during a visit?

Steve: Not very long. Usually one gets out and tries to find the cache and the rest stay in the car.

Katie: Okay. When visitors come, do they purchase any products from your operation?

Steve: Some have and some have not because some visitors come during the off season.

Katie: Okay, What’s the average amount?

Steve: Not a lot because they didn't plan on coming and buying anything but they feel like they should buy something for coming.

Katie: Okay are these visitors returning?

Steve: Yes, they continue to come back. At least the ones I have talked to.

Katie: Okay. Now have you seen any benefits from participating in AgCache?

Steve: For my personal business, yes revenue and the publicity. For agriculture as a whole, yes. It benefits everyone in the industry.

Katie: Okay, have you seen an increase in agritourism in your area since joining AgCache?

Steve: Can't really say. There's a state park down the road and they already have geocaches in the park. So, we already see an increase in tourists and visitors in the area. My business has continued to grow each year. So, I can't say for sure the connection to AgCache has changed my business.
Okay. What characteristics of AgCache do you like best? Any drawbacks you have experienced?

Steve
Nothing negative. There is a chance that people come by when we're closed. I would tell people to put the cache near the road and not near operation buildings.

Katie
Would you recommend AgCache to other operations that are concerning joining?

Steve
Yeah. Okay. That concludes the formal questions. Do you have anything else you would like to add?

Katie
Ah, no.

Steve
Okay thank you very much Steve. I greatly appreciate your time with this interview. If you have any questions to comments please don’t hesitate to call or email me.

Steve
Okay.

Katie
Thank you and have a great day.

Steve
Thanks you too.

Katie
Bye

Steve
Bye.
Appendix A-9: Existing AgCache Site: Participant 2 Interview Transcript

Name: Hethwood Market  
Type of Operation: Country Store  
Location: Blacksburg, Va  
Date joined AgCache: Spring 2010

Introduction
1. Had you heard of geocaching prior to signing up for AgCache?  
   I had.  
2. How did you hear about AgCache?  
   Through different publications, nothing specific and talked to other users.

Implementation
3. What concerns or questions did you have before agreeing to join AgCache?  
   None.  
4. Can you describe the process you went through to get the AgCache site set up at your location?  
   Just told them I wanted and they set up everything up and sent the stuff.  
5. Did you have to make and changes to your operation to accommodate AgCache?  
   Prompt: Ask about schedule and hours of operation, physical layout such as gaits.  
   No.  
6. What costs were associated with joining AgCache?  
   None.  
7. How much time have you had to implement with the service?  
   None.

Visitors
8. What type of visitors do you get? For example individuals, couples, groups?  
   All of those no trends. A couple of college kids, younger couples, older couples  
9. Do you know where they are from? Local? Instate? Out of state?  
   A little bit of everything some local some traveling through, no one us really from around here.  
10. Do you have any idea of their prime motivation for visiting the site? Geocaching? Agrotourism?  
    Not because of agriculture.  
11. Have the visitors provided you with any direct feedback during or after their visit?  
    Liked the store.  
12. During what months do you get the most visitors?  
    Hard to tell. Haven’t had it a whole year.  
13. Any sense of how many?  
    Over 20. But haven’t looked at the log recently  
14. What day of the week is most popular for AgCache visitors?  
    Random. Primarily weekends.
15. How long do they generally stay during a visit?
   
   5-10 minutes.

**Benefits to the Organization**

16. When visitors come, do they purchase any products from your operation?
   
   50% do.

17. How many visitors per week would you estimate purchase goods?

18. For those that purchase goods, what is the average amount that they spend?

19. Are these visitors returning?
   
   *Have recognized some coming back, but no real way to measure that.*

20. Have you experienced any other benefits from participating in *AgCache*? If so please describe.
   
   *Talking to me.*

21. Have you seen an increase in agritourism in your area since joining *AgCache*?
   
   *Not and increase per say but strong in the area.*

**The *AgCache* Experience**

What characteristics of *AgCache* do you like the best?

*No time or effort, helps draw people to you.*

22. What if anything would you change?
   
   *Prompt: Any draw backs to participating in *AgCache*?*
   
   *Nothing.*

23. Would you recommend *AgCache* to other operations that are considering joining?
   

25. That concludes our formal questions. Is there anything else you would like to add?
Appendix A-10: Existing AgCache Site: Participant 3 Interview Transcript

Name: Cullipher Farm Market
Type of Operation: Farmers Market
Location: Virginia Beach

Introduction
1. Had you heard of geocaching prior to signing up for AgCache?
   Referred to an signed up because of the friends Jordan and Steve from College Run Farms.
2. How did you hear about AgCache?

Implementation
3. What concerns or questions did you have before agreeing to join AgCache?
   Market is open seasonally so at the beginning people came when they were not open so they had problems with that. But eventually since the site stated to only come during specific hours they resolved that.

4. Can you describe the process you went through to get the AgCache site set up at your location?
   The founders of Ag Cache came out and did everything. They set it up and explained what was expect of them and what was expect of people visiting. The only thing they had to was figure out where they wanted to place the cache and if they wanted it to be easy, medium, or hard to find. Stress free on their part.

5. Did you have to make and changes to your operation to accommodate AgCache?
   Prompt: Ask about schedule and hours of operation, physical layout such as gaits.

6. What costs were associated with joining AgCache?
   No cost. They paid for the box the cache is hidden in.

7. How much time have you had to implement with the service?
   No time. Only thing you have to do is call for a new log book when it is full. But doesn’t require any day to day time.

Visitors
8. What type of visitors do you get? For example individuals, couples, groups?
   Mainly individuals.

9. Do you know where they are from? Local? Instate? Out of state?
   Tourist looking for other caches, there are several in the area. A few locals. Some hobbyist who travel.

10. Do you have any idea of their prime motivation for visiting the site? Geocaching? Agrotourism?
    They got one for free advertising so their thought process was to get people to come to cache and hopefully they would buy something from the market. (I realize now that doesn’t really answer this questions but that was his answer)

11. Have the visitors provided you with any direct feedback during or after their visit?

12. During what months do you get the most visitors?
    The month of may.

13. Any sense of how many?
Less than 10.

14. What day of the week is most popular for AgCache visitors?
   Friday, Saturday, Sunday
15. How long do they generally stay during a visit?
   Half- only motivation is to find the cache. Others explore the surrounding area, ask questions and are very inquisitive.

Benefits to the Organization
16. When visitors come, do they purchase any products from your operation?
   Only had it one year, not a strong correlation between cache and people buying things
17. How many visitors per week would you estimate purchase goods?
   None.
18. For those that purchase goods, what is the average amount that they spend?
19. Are these visitors returning?
   No.
20. Have you experienced any other benefits from participating in AgCache? If so please describe.
   Always nice to hear peoples stories, the places they have visited and things they have learned along their journeys.
21. Have you seen an increase in agritourism in your area since joining AgCache?
   Yes an increase in agritourism but AgCache does not play a large role in the community or surrounding area. They are the only people in the area with one so they would not correlate the two.

The AgCache Experience
22. What characteristics of AgCache do you like the best?
   Little amount of time to keep up and doesn’t cause too many headaches.
23. What if anything would you change?
   Prompt: Any draw backs to participating in AgCache?
   No, no drawbacks.
24. Would you recommend AgCache to other operations that are considering joining?
   Absolutely.
25. That concludes our formal questions. Is there anything else you would like to add?
CHAPTER III: Linking Specialty Crop Producers to Institutional Foodservice Establishments: General Barriers and Food Safety Considerations

ABSTRACT

Specialty crops are defined as fruits and vegetables, tree nuts, dried fruits, and nursery crops. Over 248,000 farmers were involved in specialty crop production in 2007 (Chite, 2012). The majority of specialty crop farmers are considered small-scale, with less than $250,000 in annual gross sales. Small-scale farmers are continuously reevaluating their current production and marketing approaches to stay competitive in the agricultural industry. One marketing approach that could help achieve income stability for small-scale producers is that of marketing to institutional foodservice establishments.

Institutional foodservice establishments, such as schools, hospitals, and long-term care facilities are businesses that have a unique food procurement system and needs. These characteristics include the volume of food required, homogenous products, certification requirements, and payment arrangements. For small-scale producers, these requirements are sometimes difficult to meet and thus may prove to be barriers to accessing this marketing channel.

This study investigates the marketing channel between small-scale specialty crop producers and institutional foodservice establishments. Specifically, this study explores the barriers faced by producers and their interest in selling to institutional foodservice establishments. Small-scale specialty crop producers across the US Southeast were surveyed and data was analyzed using a probit model. Results illustrate a strong interest by producers to sell to institutional foodservice establishments despite their lack of prior experience in this marketing channel; The quantity and pricing required, however, were found to be significant barriers to producers in connecting to institutional foodservice establishments. This study provides valuable information to small-scale specialty crop producers and institutional foodservice establishments to identify supply chain partners and better meet their partner’s needs and expectations.
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SECTION I: INTRODUCTION
The centralized nature of the US food production, processing, and distribution system effectively excludes specialty crop producers, particularly those with small-scale operations, from serving as suppliers to institutional foodservice operations (schools, hospitals, penitentiaries, etc.). Due to physical or health status, it is often the clients of these food services who would most benefit from an increase in the consumption of specialty crops. Institutions, however, are often limited in their resources and lack the market-based incentives to incorporate these foods into their menu planning (Boys, 2009).

With the passage of the US Food and Drug Administration (FDA)'s S.510 -Food Safety and Modernization Act (FSMA), further barriers are likely to arise in this marketing channel (US Food and Drug Administration, 2013). Provisions in this Bill would institute food traceability and food product liability insurance requirements so that sources of tainted foods can be more easily identified and liability better assigned. The Tester-Hagan amendment provided an exemption for small and medium scale producers who sell more than 50% of their products directly to consumers and restaurants (McGeary, 2010). By the USDA’s definition, a small-scale agricultural producer generates annual gross revenues under $250,000; farms of this size form 88 percent of all US farms (Hoppe and Banker, 2010).

Food safety measure requirements by institutional foodservice establishments were unchanged by the FSMA. According to the Community Food Security Coalition report, institutions are mostly also “self-operated” institutions, which explains why requirements “vary quite a bit in their food safety requirements, ranging from no requirements to GAP certification” (Markley, 2010). As a result, institutional foodservice establishments “play a key role in establishing food safety requirements and in determining the terms under which producers have market access” (Markley, 2010). Therefore, this project seeks to explore potential marketing and
food safety barriers, which may limit the ability of small-scale specialty crop producers to serve as suppliers to institutional foodservices. The extent of interest small-scale specialty crop producers to sell to institutional foodservice establishments is also examined. The geographic scope of this project is limited to the S-SARE region.

Several series of focus groups with a variety of stakeholders have been already conducted (Boys et al., 2012; Westray, 2012). At this stage, quantitative nuance is needed to verify previous focus group results. This project is focused on the Southern Sustainable Agriculture Research & Education (S-SARE) region, which includes the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia (Figure 3.1). Puerto Rico and the US Virgin Islands were excluded from this study due to the dissimilar agriculture as compared that in other states in the S-SARE region.

Figure 3.1: Sustainable Agriculture Research & Education Regional Map
Source: Sustainable Agriculture Research & Education
I.1. Study Aim and Objectives

The overall goal of this study is to identify and assess the general barriers faced by small-scale specialty crop producers to gain access to contractual agreements with institutional foodservice operations in the S-SARE region. As well, this study investigated the extent of interest of small-scale specialty crop producers in selling to institutional foodservice establishments.

For this study, the following hypotheses were proposed: (1) small-scale specialty crop producers will be more interested in selling to institutional foodservice establishments if they have higher current levels of annual sales, (2) small-scale specialty crop producers will be more interested in selling to institutional foodservice establishments if they already sell to an institutional foodservice establishment, (3) small-scale specialty crop producers will be more interested in selling to institutional foodservice establishments if they participate in state agricultural marketing programs, (4) small-scale specialty crop producers will be more interested in selling to institutional foodservice establishments if they have already implemented a traceability system, and (5) small-scale specialty crop producers will be more interested in selling to institutional foodservice establishments if they have food product liability insurance. A more detailed explanation of these hypotheses is presented in Appendix B-1.

I.2. Overview of the Food Safety and Modernization Act

Passed on January 4, 2011, the Food Safety and Modernization Act (FSMA) provided key mandates for achieving higher standards of food safety and ensuring better reaction times to foodborne illness occurrences in the United States. This legislation requires “science-based, minimum standards for the safe production and harvesting of fruits and vegetables,” (US Food and Drug Administration, 2013). The first of the mandates focuses on issuing recalls. The Food and Drug Administration has the authority to recall any food products at any time. As well, the
Bill mandates continuous inspections. More frequent and stringent inspections are conducted, especially on food facilities that produce foods with greater food safety risks. Furthermore, expanded record keeping is mandatory for all producers and food facilities and must be accessible to the FDA for inspection purposes. According to the FSMA (2011), recordkeeping requirements are enforced for “any commingled raw agricultural commodity.” By definition, “‘commingled raw agricultural commodity’ means any commodity that is combined or mixed after harvesting, but before processing.” Furthermore “with respect to the manufacturing, processing, packing, or holding of the applicable food, the Secretary shall require such person to maintain records that identify the immediate previous source of such food and the immediate subsequent recipient of such food” (USDA, 2013). In January 2013, the FDA released two of the five regulations for public comment in regards to the FSMA. The two released regulations specifically address food safety issues with fruit and vegetable production in regards to packaging, worker hygiene, water quality, and soil materials. The FDA’s deputy commissioner of foods, Mike Taylor, assured the public that impacted farms should be able to meet these regulations regardless of their farm size. As well, Taylor mentioned that only farms who sold produce that is “eaten raw” would be required to follow these regulations (Satran, 2013a). However, in April 2013, a California judge declared that the FDA was in violation of “unlawfully withholding” the regulations and not allowing public comment by its original promised release date of July 2012. Specifically, U.S. District Judge Hamilton ruled that “the seven food safety regulations were being ‘unlawfully withheld’ and that "the FDA has violated the FMSA and the [Administrative Procedure Act] by failing to complete the regulations by the statutory deadlines.” (Satran, 2013b) As a result, the FSMA has yet to be implemented or enforced.
I.2.1. Tester-Hagan Amendment
Due to the proposed mandates in the FSMA, small and medium-scale producers called for relief from the specified mandates. The Tester-Hagan Amendment provided an exemption for agricultural producers had food sales of less than $500,000 and qualified food sales within the same state or within 275 miles (Hamrick). Furthermore if producers sell more than half of their products directly to individual consumers or restaurants, then they are exempt from the FSMA. This exemption precludes producers from having to adhere to the additional record-keeping or traceability mandates by the FSMA. Even with the Tester-Hagan amendment, however, individual food byers, such as institutional foodservices may require these practices be implemented by their small and medium-scale suppliers in the future.

I.3. Study Justification
Given the important role of agriculture in supporting the economic well-being and building of rural communities, as well as the heightened pressures for federal legislation on food safety measures, this study has the potential to economically benefit specialty crop producers by identifying the general barriers to accessing contractual agreements with foodservice institutions. In following up on earlier exploratory research (Westray, 2012), this study uses quantitative research techniques to explore the current barriers faced by specialty crop producers. The findings from this study illustrate the similarities in barriers faced by small-scale specialty crop producers across a thirteen state region in the US Southeast (the S-SARE region), and demographic characteristics of small producers who are interested in selling to institutional foodservice establishments are also identified and evaluated. These findings provide valuable insight into the difficulties with connecting small-scale producers and institutional foodservice establishments.
I.4. Organization of this Paper

This study examines barriers to small and medium-scale specialty crop producers to entering contractual agreements with institutional foodservices. A background of specialty crops and specialty crop marketing is introduced in Section II. The research methodology, including survey development and distribution, the empirical model, and data analysis are presented in Section III. Results are discussed in Section IV. Specific focus is paid to logistic and food safety constraints, and demographic characteristics of producers interested in selling to institutional foodservice establishments. Conclusions including key findings, study limitations, and recommendations, are presented in Section V.

SECTION II: LITERATURE REVIEW

II.1. US Specialty Crop Production

While the United States is known for its large-scale production of traditional row crops, specialty crops are still vital agricultural commodities. In 2007, “the value of farm-level specialty crop production totaled $42 billion, representing more than 40% of the value of U.S. crop production, yet accounting for only 3% of all harvested cropland acres. U.S. exports of specialty crops totaled nearly $15.9 billion in 2010, or about 15% of total U.S. agricultural exports” (Chite, 2012). As well in the same year, “there were 248,000 farming operations that grew fruits, tree nuts, vegetables, floriculture, and other horticultural specialties.” Specialty crops sales were mostly focused in the following states: California, Florida, Washington, Oregon, North Dakota, and Michigan. However, every US state has some form of specialty crop production (Chite, 2012).

Specialty crops are usually divided into the following three categories: Fruit & Nut, Vegetables, Melons, Potatoes, & Misc. Specialty Crops, and Nursery & Floriculture. These and
the revenues generated in each specialty crops category are depicted in Figure 3.2 as well as other major US crop production categories.

Figure 3.2: 2005 US Crop Values of Production

Not only are specialty crops consumed domestically, but also traded internationally. Latin America and Eastern and Southern Asia are the main export markets for US domestic food products due to their increasing growth rate (Paggi, 2007). The United States imports specialty crops due to increasing demands for specific crops such as tropical fruits that cannot be domestically grown year-round. For example, “imported fruits, vegetables and melons, and nuts—notably bananas—are either not grown in the United States or are imported in times of the year when U.S.-grown products are not available” (Paggi, 2007). Even with the “primary market for most U.S. produced specialty crops” being the domestic market, (Paggi, 2007) domestic producers still need to be competitive in the fruits and vegetables market. Although the U.S. fruit and vegetable exports totaled $9 billion in 2007, U.S. imports of fruits and vegetables more than doubled at $16 billion, which created a trade deficit of $7 billion in 2007.
II.1.2. Specialty Crop Production in the US Southeast

Roughly 30% of all specialty crop operations and 30% of all small-scale specialty crop producers in the United States were located in the S-SARE region in 2007 (Vilsack, 2009)

Roughly 91% of specialty crop farms in the US South are considered small-scale operations (2007; Vilsack, 2009). As a result, the majority of specialty crop production is not considered commercial-scale in this region. Importantly, roughly 22% of US agricultural land in 2007 was harvested for fruits, berries, & nuts, and vegetables, melons & pulses in the S-SARE region. As of 2011, at least seven out of the thirteen states in the S-SARE region had a specialty crop in their top five commodities (Table 3.1).

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<td>Broilers</td>
<td>Soybeans</td>
<td>Corn</td>
<td>Cotton</td>
<td>Aquaculture</td>
</tr>
<tr>
<td>NC</td>
<td>Broilers</td>
<td>Hogs</td>
<td>Turkeys</td>
<td>Greenhouse/Nursery</td>
<td>Soybeans</td>
</tr>
<tr>
<td>OK</td>
<td>Cattle &amp; Calves</td>
<td>Hogs</td>
<td>Broilers</td>
<td>Wheat</td>
<td>Dairy Products</td>
</tr>
<tr>
<td>SC</td>
<td>Broilers</td>
<td>Turkeys</td>
<td>Greenhouse/Nursery</td>
<td>Cotton</td>
<td>Cattle &amp; Calves</td>
</tr>
<tr>
<td>TN</td>
<td>Cattle &amp; Calves</td>
<td>Soybeans</td>
<td>Broilers</td>
<td>Corn</td>
<td>Cotton</td>
</tr>
<tr>
<td>TX</td>
<td>Cattle &amp; Calves</td>
<td>Cotton</td>
<td>Dairy Products</td>
<td>Broilers</td>
<td>Greenhouse/Nursery</td>
</tr>
<tr>
<td>VA</td>
<td>Broilers</td>
<td>Cattle &amp; Calves</td>
<td>Dairy Products</td>
<td>Turkeys</td>
<td>Greenhouse/Nursery</td>
</tr>
</tbody>
</table>

II.1.3. Specialty Crop Markets

One of the main motivations for current specialty crops demand is the local foods movement. This movement is based on the concept of “increasing reliance on foods produced near their point of consumption relative to the modern food system,” (Peters et al., 2008) and ultimately “seeks to enhance access to safe, healthy, and culturally appropriate food for all consumers. As well, challenges to the dominance of large corporations also have contributed to efforts to expand local food” (Martinez et al., 2010). One of the major programs supporting buying local in connection with specialty crops buying is the Specialty Crop Block Grant Program (SCBGP, 2013). In 2004, SCBGP provided grants “to enhance the competitiveness of specialty crops, which include fruits, vegetables, and floriculture. The state agencies who applied for the grants could use the funds for initiatives that included ‘buying local’ and ‘state product marketing campaigns’. For example, in 2008, grants were awarded to projects that promote[d] local food through print materials, electronic media, and a specialty crop website; educates consumers about how to locate and purchase local specialty crops; and evaluates the development of a farm to school program” (Martinez et al., 2010).

One major buyer of specialty crops is the direct consumer. The 2007 Agriculture Census defines selling to the direct consumers as “agricultural products sold directly to individuals for human consumption from roadside stands, farmers’ markets, pick-your-own sites, etc” (Martinez et al., 2010). Other direct marketing channels include “farmers’ markets, community supported agriculture (CSAs), farm stands/on-farm sales and internet sales, and ‘pick your own’ operations.” Other less formal sources include “home gardening and sharing among neighbors, foraging and hunting, and gleaning programs” (Martinez et al., 2010). According to the USDA Economic Research Service, “direct-to-consumer sales of agricultural products account for a small, but fast-growing segment of U.S. agriculture, increasing by $399 million or 49 percent
from 2002 to 2007, and by $660 million or 120 percent from 1997 to 2007. Much of the recent
growth for direct-to-consumer selling and marketing has been in the fruit and vegetable
categories (which can be seen in Table 3.2).

Table 3.2: Direct Marketing to Consumers’ Impact on Agriculture

<table>
<thead>
<tr>
<th>Number of farms</th>
<th>Vegetable and melon</th>
<th>Fruit and tree nut</th>
<th>Beef</th>
<th>Other animal products</th>
<th>Other crops and plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>14,487</td>
<td>14,381</td>
<td>27,133</td>
<td>41,016</td>
<td>21,190</td>
</tr>
<tr>
<td>2007</td>
<td>17,961</td>
<td>17,161</td>
<td>35,984</td>
<td>43,274</td>
<td>22,437</td>
</tr>
<tr>
<td>Percent change</td>
<td>24</td>
<td>19</td>
<td>33</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Value (million dollars)</td>
<td>198.2</td>
<td>196.5</td>
<td>77.0</td>
<td>179.7</td>
<td>160.9</td>
</tr>
<tr>
<td>2002</td>
<td>335.3</td>
<td>343.9</td>
<td>141.4</td>
<td>236.0</td>
<td>154.7</td>
</tr>
<tr>
<td>2007</td>
<td>335.3</td>
<td>343.9</td>
<td>141.4</td>
<td>236.0</td>
<td>154.7</td>
</tr>
<tr>
<td>Percent change</td>
<td>69</td>
<td>75</td>
<td>84</td>
<td>31</td>
<td>-4</td>
</tr>
</tbody>
</table>


Other food buyers such as retailers and institutional food buyers, such as schools and
hospitals are also interested in locally grown specialty crop products. According to The Ohio
State’s recently published booklet entitled *Ohio Specialty Crops* (Shoenfelt, 2012) “locally
grown fruits and vegetables are making their way into the kitchens of schools, universities,
health care centers, and restaurants…These institutions are responding to requests from their
customers to make the food as wholesome and delicious as possible.” An Iowa State University
study showed that various Iowa farmers have been selling their specialty crops and other foods
products to institutional food buyers, such as restaurants and other institutions for a few years
(Pirog, 2002). In this case, Iowa farmers sold to various local institutions including “colleges
and universities, nursing homes, hospitals, corporate cafeterias, conference centers, hotels and
restaurants, state government-run institutions (prisons, county cafeterias), and through business
subscription enterprises” (Pirog, 2002).
Local food retailers, such as grocery stores, are also interested in buying locally grown products to entice more customers. “Green” grocery stores feature “goods from specialty, natural, local, and organic food producers and processors” to satisfy their customers (Pirog, 2012).

Particularly for restaurants, chefs often try to buy locally grown foods for the perceived quality and due to consumer demand. Chefs have been buying more locally grown food to create more superior dishes in their restaurants (Painter, 2008). In Ohio, executive chefs realized “the value that Ohio grown fruits and vegetables” provides (Shoenfelt, 2012). Specifically, “the freshness, color, and great taste” create more appetizing and appealing meals for customers (Shoenfelt, 2012).

II.1.3.1 Institutional Foodservice Establishments
Globally, institutional foodservices account for 35% of the total foodservice market (Datamonitor, 2009). On a national scale, the farm-to-institution market has been expanding. “Within the institutional sector, $29.3 billion was spent for food at schools and colleges, and $40 billion at other institutions, such as hospitals, corporate cafeterias, prisons, military exchanges and clubs, and airlines in 2004” (Brown and McNulty, 2006). The second largest US food service market in the United States is institutions (Brown and McNulty, 2006). Institutions are considered businesses that have unique conditions when buying food from vendors. For example, most institutional food services’ food buying procedures are influenced by cyclical menus, large customer base to feed (usually over 100 customers), extensive labor time for food preparation, safety concerns with served food, multiple vendor contracts, complex payment procedures, and large quantities needed to assure an adequate food supply (Strohbehn and Gregoire, 2002). Typically, institutional food buyers are considered large enterprises such as schools, nursing
homes, hospitals, corporate cafeterias, and state government-run institutions such as penitentiaries (Pirog, 2002).

In North America, institutional foodservices contract food sales through three dominant foodservice corporations: Compass Group, ARAMARK and Sodexo (Martin & Andrée, 2012). These three corporations provide food contracts to institutional foodservices and also have a large global customer base. “Their business model is based on centralized supply chains and management structures, with a reliance on prepared and “ready to eat” food, intended to lower procurement and labor costs” (Martin & Andrée, 2012). Institutional foodservice establishments rely on these large corporations to provide the required food supplies due to the long political and economic history (Martin & Andrée, 2012). Furthermore, institutional foodservice establishments rely on the convenience of these established contracts with food vendors, and are reluctant to start contracts with smaller producers due to a perceived smaller selection of products (Shoenfelt, 2012).

However, the demand for specialty crops in institutional foodservice establishments has been steadily increasing. In Iowa, institutional foodservice buyers are strongly interested in buying more locally grown produce from local farmers due to the benefits of supporting local farmers, lowering transportation costs, and serving fresher and higher quality food options (Pirog, 2002). In Ohio, local farmers and institutional food buyers’ relationships are increasing due to the institutional foodservice establishments “learning the seasonality of local crops” and opening up to the “opportunity to work with local growers who utilize season-extension growing techniques” (Shoenfelt, 2012).

The benefits from the relationships established between foodservice institutions and local farmers can be numerous. For example, the relationships can increase entrepreneurial
opportunities for the local farmer, which can address both the needs of the foodservice institutions as well as the goals of the local farmer (Shoenfelt, 2012). Furthermore, these relationships can circulate more revenue throughout the local economy, maintain a rich agricultural landscape throughout the area, ensure sustainability for the future farming generations, promote community support, satisfy customers’ desires for fresher produce, and enjoy higher quality produce during peak season (Shoenfelt, 2012).

Farm-to-school programs also represent an influential food buyer for specialty crop production. The collaborative program that connects local farmers to schools emphasized the importance of buying fresh produce directly from the local farmers (Joshi et al., 2006). As seen in the “Crunch Lunch Program” in Davis, California, the lunch program spent “more than $75,000 on locally grown, farm fresh produce from 2000-06” (Joshi and Azuma, 2008). The overall program’s goals of the farm-to-school programs are to provide healthy options, such as fruits and vegetables to children, improve the relationship between farmers and schools, and address the issues of childhood obesity and school meal quality (Joshi and Azuma, 2008).

II.1.4. Future of Specialty Crop Production

According to the US Agriculture Deputy Secretary, Kathleen Merrigan, “specialty crop producers in the United States…are seeing sales surge both domestically and abroad as consumers search for high quality, 'Grown in America' fruits, vegetables and tree nuts. These projects will help provide specialty crop producers with the information and tools they need to successfully grow, process and market safe and high quality products, supporting jobs and opportunities for Americans working in specialty crops. From herbs to apples, from walnuts to grapes, specialty crops are central to the richness of American agriculture” (Martin, 2011).
As seen in Figure 3.3, the overall value of specialty crop production is projected to continue its steady increase.

![Figure 3.3: Current and Projected Value of Specialty Crop Production](image)


In regards to the tree fruit and nut category, the value of this production is expected to grow by 2 percent annually over the next decade (Interagency Agricultural Projections Committee, 2013). Vegetable and pulse sales are “projected to grow 1.2 percent per year, led by fresh-market vegetables” (Interagency Agricultural Projections Committee, 2013.) Further, the USDA projected that “farm sales of greenhouse and nursery crops are projected to increase at an annual rate of 0.5 percent” over the next several years. Overall, the US volume of farm production is expected to increase in all categories of the specialty crops. Specialty crop production sales are projected to rise in foreign markets as well. The majority of US exports are consumed by developing countries such as China, India, and the rest of Asia. The USDA projects that “exports of U.S. horticultural products are projected to reach $42.4 billion in fiscal year 2022. Of this amount, fruit and nuts contribute $20.8 billion, and vegetables contribute $8.2 billion” (Interagency Agricultural Projections Committee, 2013). Overall, all US agricultural
production including specialty crops is expected to increase with the assumption that the 2008 Farm Bill will remain in effect throughout the projected years (Interagency Agricultural Projections Committee, 2013).

II.2. Marketing Specialty Crops to Institutional Food Services

One of the key instruments in accessing institutional food contracts is through aggressive marketing. In the Iowa study, farmers stated that one of the key factors for assuring future sales to institutional food services was marketing skills (Pirog, 2002). As well, The Ohio State University Cooperative Extension has developed the MarketReady Training Program that provides detailed marketing information for securing contracts with institutional food services. The program emphasizes the importance of producers maintaining strong and lasting relationships with these institutions (Shoenfelt, 2012). However, barriers between institutions and producers can cause issues with obtaining these contracts even with adequate marketing techniques.

II.2.1. General Barriers

Institutional foodservice establishments face unique circumstances with providing food to their customers. For any producer to be considered as a potential supplier, the issues of labeling, packaging, grade and quality, pricing, delivery, food safety, and insurance must be addressed (Shoenfelt, 2012). In Westray’s study (2012), small and medium-scale specialty crop producers in North Carolina, South Carolina, and Georgia expressed barriers faced to access institutional foodservice establishments. These barriers included seasonality, infrastructure, quantity required, product attributes, delivery challenges, price and payment arrangements. As well, federal regulations cause issues between institutional food services and farmers. Specifically with the FSMA, the food service directors could face stringent governmental regulations in regards to
requiring small and medium-scale farmers to implement food safety measures and obtain liability insurance coverage in the near future (FDA, 2013).

**II.2.2. Food Safety Barriers**

Before they can sell specialty crops to institutional food services, farmers are required to follow any food safety measures required by federal and state regulations. Most institutional food services want to assure that all food is handled and packaged safely and appropriately using a general set of standards known as the Good Agricultural Practices (GAP) (Shoenfelt, 2012). Farmers in “compliance with the GAP standards reduce the risk of products being exposed to contamination from biological, chemical, or physical sources” (Shoenfelt, 2012). Farmers can receive guidance to ensure their operation is GAP-certified through land-grant university extension services and private farm consultants. Essentially, the standards subject a producer to “second-party audits, where the buying company inspects a farming operation based on a pre-determined set of standards; or a third-party audit, conducted by an independent auditor according to the applicable standards” as well as recommend the producer to implement a tracking system, also known as traceability, for all products to be identified and traced back to the operation if any foodborne illness or contamination should be discovered (Shoenfelt, 2012).

Firms’ motivations for requiring traceability systems include: “1) protecting or regaining the general reputation of a product, a firm, an industry, or a country, 2) differentiating products by suppliers who provide traceability, 3) guaranteeing product origin when origin is an attribute of interest to consumers or others, 4) improving supply management by firms, 5) monitoring and assuring production or processing methods, and 6) improving the effectiveness of product recalls after the discovery of a food safety or product quality problem” (Paggi et al., 2008). Traceability systems addresses the issues of liability for food safety and/or product quality. “Food traceability
has received growing recognition by policy makers and firms in the food industry” (Paggi et al., 2008).

Furthermore, firms are requiring producers to have food product liability insurance. “In addition to the basic homeowner’s/farmstead policy, producers usually must have product-liability coverage in order to sell at farmers markets or to other buyers. This required coverage can range between one-million and five-million dollars in product liability” (Shoenfelt, 2012). As a result, small and medium-scale producers have expressed their concerns about the costs associated with implementing food safety measures such as GAP certification, traceability, and insurance (Westray, 2012). Despite these general barriers, institutional foodservice establishments and specialty crop producers continue to show interest in establishing contractual agreements (Shoenfelt, 2012).

**SECTION III: RESEARCH METHODOLOGY**

**III.1. Survey Development and Distribution**

The main objective of this study was to examine the general marketing barriers faced by small-scale specialty crop producers in the Southeastern U.S. This study gathered information in regards to the producers’ demographic characteristics, marketing activities, types of production, current customer base, traceability requirements and experience with food product liability insurance. For obtaining the most efficient amount and quality of data, an open- and closed-ended questionnaire was used. Most questions were formulated as a multiple choice selection. An open-ended question format was used when more in-depth information was required and allowed respondents to add any further comments or explanations to their responses. The questionnaire was designed by deciding what key information should be obtained from the respondents. First, an initial set of questions was formulated from the previous focus group
study’s discussion guide questionnaire (Westray, 2012). After the selection of useable questions was finalized, additional questions were formulated to specifically address the barriers of traceability and food product liability insurance. Next, questions were reworded for clarity and to ensure correct interpretation. After editing, questions were ordered logically for fluid conversation. The survey was uploaded into an electronic survey software program, *Qualtrics*, for electronic distribution. The complete producer’s survey is summarized in Appendix B-2.

The overall population consisted of all S-SARE small-scale specialty crop producers. In respects to the sampling frame, an estimate of the total number of small-scale specialty crop producers in the S-SARE region was collected. As this survey was distributed electronically, an electronic contact method was required. However, all of the producers’ email addresses were impossible to collect given the nonexistence of a published list. To the extent possible, a list of small and medium-scale producer email addresses was compiled from MarketMaker, state departments of agriculture, and state agricultural marketing websites, and state agricultural associations. MarketMaker is national partnership of land grant institutions and State Departments of Agriculture dedicated to the development of a comprehensive interactive database of agricultural operations and food industries (Food Industry Market Maker, 2013). MarketMaker was used to collect small-scale specialty crop producers’ contact information in the S-SARE states with the exception of North Carolina, Oklahoma, Tennessee, and Virginia. Table 3.3 presents the distribution of the estimated population in regards to collected email addresses and response counts from all thirteen states.
Table 3.3: Distribution of Population by State

<table>
<thead>
<tr>
<th>State</th>
<th>Small-Scale Specialty Crop Producers</th>
<th>Potential Participants (Email)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL</td>
<td>3,025</td>
<td>218</td>
<td>7.2</td>
</tr>
<tr>
<td>AR</td>
<td>1,342</td>
<td>110</td>
<td>8.2</td>
</tr>
<tr>
<td>FL</td>
<td>11,791</td>
<td>383</td>
<td>3.2</td>
</tr>
<tr>
<td>GA</td>
<td>4,447</td>
<td>323</td>
<td>7.3</td>
</tr>
<tr>
<td>KY</td>
<td>2,531</td>
<td>182</td>
<td>7.2</td>
</tr>
<tr>
<td>LA</td>
<td>1,833</td>
<td>134</td>
<td>7.3</td>
</tr>
<tr>
<td>MS</td>
<td>2,511</td>
<td>113</td>
<td>4.5</td>
</tr>
<tr>
<td>NC</td>
<td>6,320</td>
<td>457</td>
<td>7.2</td>
</tr>
<tr>
<td>OK</td>
<td>2,206</td>
<td>163</td>
<td>7.4</td>
</tr>
<tr>
<td>SC</td>
<td>2,606</td>
<td>219</td>
<td>8.4</td>
</tr>
<tr>
<td>TN</td>
<td>1,462</td>
<td>182</td>
<td>12.4</td>
</tr>
<tr>
<td>TX</td>
<td>8,913</td>
<td>420</td>
<td>4.7</td>
</tr>
<tr>
<td>VA</td>
<td>2,795</td>
<td>202</td>
<td>7.2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>51,782</td>
<td>3,106</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Once the questionnaire was finalized for electronic distribution, the individual producers and farmers’ markets’ contacts were contacted via a personalized email and provided a link to the survey. Additional information about the project and consent verification was included on the introduction page of the electronic survey. After one week from initial distribution, reminder emails were sent to those who had not yet responded. The first reminder email summarized the importance of the producer’s participation, overall importance of project, time requirement, reassurance of voluntary participation and confidentiality, and the link to the online survey. After another four weeks, final reminder emails were sent to the remaining producers who had not responded.

**III.2. Empirical Model & Data Analysis**

For this study, logistic and food safety barriers were evaluated as well as the extent of interest of small-scale specialty crop producers to enter into contractual agreements with institutional foodservice establishments. The model selected was a probit model due the dependent variable’s binary choice responses. Usually with binary choice models, a probit or
logit regression can be used to analyze the data. According to Wooldridge (2006), economists generally prefer probit models in comparison to logit models due to the normal distribution of the error term, $e$. This model evaluated respondent opinion: *Yes, I am interested in selling to an institutional foodservice establishment*, or *No, I am not interested in selling to an institutional foodservice establishment*. The probit model general form is:

$$P(y = 1 | x) = G(\beta_0 + \beta_1 x_1 + \cdots + \beta_k x_k) = G(\beta_0 + x\beta)$$

(3.1)

where $G$ is a function with values only between zero and one: $0 < G(z) < 1$, for all real numbers ($z$) was used (Wooldridge, 2006). With the probit model, standard normal cumulative distribution function (cdf) is assumed $G(z) = \Phi(z)$. For the derived probit model, an underlying latent variable model was used:

$$y^* = \beta_0 + x\beta + e, y = 1[y^* > 0]$$

(3.2)

where the $1[\cdot]$ is the indicator function, which only has the values of zero or one (Wooldridge, 2006). Value one occurs when the participant is interested in selling to an institutional foodservice establishment and zero if not interested. $y^*$ is assumed to be a function of observed and unobserved variables (Evans, 2004). The probability for $y$ can be determined by:

$$P(y = 1) = 1 - G[-(B_0 + x\beta)] = G(B_0 + x\beta)$$

(3.3)

For any probit model, the coefficients can only be analyzed as the direction of the effect of $x$ on $y^*$. Therefore, to analyze the magnitude of the effect of $x$ for a participant to be interested in selling to an institutional foodservice establishment, marginal effects must be calculated (Wooldridge, 2006). The marginal effect of $x$ on the probability of being interested in selling to an institutional foodservice establishment is given by:

$$ME = \frac{\partial \Pr(y=1 | x)}{\partial x} = \frac{\partial G(x\beta)}{\partial x}$$

(3.4)

where the function $G(.)$ is the cumulative normal distribution function (Lemieux, 2012).
Below are the explanatory variables that were used to predict if a participant was interested in selling to an institutional foodservice establishment:

\[ y_i^* = \beta_0 + \beta_1 \text{trace}_i + \beta_2 \text{foodprod}_i + \beta_3 \text{years}_i + \beta_4 \text{gross}_i + \beta_5 \text{male}_i + \beta_6 \text{age}_i + \beta_7 \text{al}_i + \beta_8 \text{ar}_i + \beta_9 \text{fl}_i + \beta_{10} \text{ga}_i + \beta_{11} \text{ky}_i + \beta_{12} \text{la}_i + \beta_{13} \text{ms}_i + \beta_{14} \text{nc}_i + \beta_{15} \text{ok}_i + \beta_{16} \text{sc}_i + \beta_{17} \text{tn}_i + \beta_{18} \text{tx}_i + \beta_{19} \text{va}_i + \beta_{20} \text{specialty}_i + \beta_{21} \text{bad exper}_i + \beta_{22} \text{quanvolume}_i + \beta_{23} \text{quality}_i + \beta_{24} \text{transport}_i + \beta_{25} \text{pricelow}_i + \beta_{26} \text{infrastructre}_i + \beta_{27} \text{paymentarrange}_i + \beta_{28} \text{requirecertif}_i + \beta_{29} \text{nositncontract}_i + \beta_{30} \text{unablecontact}_i + \beta_{31} \text{notinterested}_i + \beta_{32} \text{newtochnnl}_i + \beta_{33} \text{directmrktng}_i + \beta_{34} \text{website}_i + \beta_{35} \text{online3rdpt}_i + \beta_{36} \text{grocery}_i + \beta_{37} \text{distwholesale}_i + \beta_{38} \text{restrau}_i + \beta_{39} \text{school}_i + \beta_{40} \text{hospital}_i + \beta_{41} \text{longtermcare}_i + \beta_{42} \text{directsales}_i + e \]  

(3.5)

A more detailed description of these explanatory variables is presented in Appendix B-3.

**SECTION IV: RESULTS**

**IV.1. Respondent Characteristics**

The final sample size totaled at 130 observations. Responses from specialty crop producers across the considered geographic region were collected from all thirteen states (Table 3.5). Of these states, the highest number of observations collected in regards to the total number of responses and the selected sample were producers located in Texas, Florida, and North Carolina.

A slight majority (~55%) of small-scale specialty crop producers expressed interest in selling to an institutional foodservice establishment (Table 3.6). Importantly, none of the respondents currently sell to any institutional foodservice establishments. Therefore, the results from the dependent variable are promising for future conversations between small-scale specialty crop producers and institutional foodservice establishments about contractual agreements. In meeting institutional foodservice establishments’ common food safety requirements, roughly 36 percent of producers have implemented traceability systems and 39 percent of producers have
acquired food product liability insurance (Table 3.7). With regard to farm revenue, majority of participants in the sample would be considered very small farms. Roughly 70 percent of respondents had annual gross incomes under $50,000 (Table 3.8). All producers reported in the sample participating in a state or regional marketing program. North Carolina and South Carolina’s two marketing programs were combined into a single dummy variable for each state. Table 3.9 presents the frequencies of producers who sell into several common marketing channels.

Table 3.5: Distribution of Responses by State

<table>
<thead>
<tr>
<th>State</th>
<th>Total Producers</th>
<th>Percentage of Total Producers</th>
<th>Frequency in Sample</th>
<th>Percentage of Sample</th>
<th>Cumulative Percentage of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>16</td>
<td>4.97</td>
<td>8</td>
<td>6.15</td>
<td>6.15</td>
</tr>
<tr>
<td>Arkansas</td>
<td>11</td>
<td>3.42</td>
<td>6</td>
<td>4.62</td>
<td>10.77</td>
</tr>
<tr>
<td>Florida</td>
<td>39</td>
<td>12.11</td>
<td>15</td>
<td>11.54</td>
<td>22.31</td>
</tr>
<tr>
<td>Georgia</td>
<td>34</td>
<td>10.56</td>
<td>12</td>
<td>9.23</td>
<td>31.54</td>
</tr>
<tr>
<td>Kentucky</td>
<td>13</td>
<td>4.04</td>
<td>6</td>
<td>4.62</td>
<td>36.16</td>
</tr>
<tr>
<td>Louisiana</td>
<td>13</td>
<td>4.04</td>
<td>8</td>
<td>6.15</td>
<td>42.31</td>
</tr>
<tr>
<td>Mississippi</td>
<td>10</td>
<td>3.11</td>
<td>4</td>
<td>3.08</td>
<td>45.39</td>
</tr>
<tr>
<td>North Carolina</td>
<td>44</td>
<td>13.67</td>
<td>19</td>
<td>14.62</td>
<td>60.01</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>19</td>
<td>5.90</td>
<td>6</td>
<td>4.62</td>
<td>64.63</td>
</tr>
<tr>
<td>South Carolina</td>
<td>23</td>
<td>7.14</td>
<td>13</td>
<td>10.00</td>
<td>74.63</td>
</tr>
<tr>
<td>Tennessee</td>
<td>24</td>
<td>7.45</td>
<td>12</td>
<td>9.23</td>
<td>83.86</td>
</tr>
<tr>
<td>Texas</td>
<td>47</td>
<td>14.60</td>
<td>13</td>
<td>10.00</td>
<td>93.86</td>
</tr>
<tr>
<td>Virginia</td>
<td>29</td>
<td>9.00</td>
<td>8</td>
<td>6.15</td>
<td>100.00</td>
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</table>

Table 3.6: Interest in Selling to an Institutional Foodservice Establishment

<table>
<thead>
<tr>
<th>Value</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>58</td>
<td>44.62</td>
</tr>
<tr>
<td>Yes</td>
<td>72</td>
<td>55.38</td>
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</table>

Table 3.7: Frequency of Traceability and Food Product Liability Insurance

<table>
<thead>
<tr>
<th>Traceability</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>83</td>
<td>63.85</td>
</tr>
<tr>
<td>Yes</td>
<td>47</td>
<td>36.15</td>
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</table>

<table>
<thead>
<tr>
<th>Food Product Liability Insurance</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>79</td>
<td>60.77</td>
</tr>
<tr>
<td>Yes</td>
<td>51</td>
<td>39.23</td>
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</table>
Table 3.8: Frequency of Income Distribution

<table>
<thead>
<tr>
<th>Annual Gross Income</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Less than $1,000</td>
<td>8</td>
<td>6.15</td>
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<tr>
<td>$1,000 – $9,999</td>
<td>35</td>
<td>26.92</td>
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<tr>
<td>$10,000 - $49,999</td>
<td>47</td>
<td>36.15</td>
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<tr>
<td>$50,000 - $99,999</td>
<td>18</td>
<td>13.85</td>
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<tr>
<td>$100,000 - $174,999</td>
<td>10</td>
<td>7.69</td>
</tr>
<tr>
<td>$175,000- $249,999</td>
<td>12</td>
<td>9.23</td>
</tr>
</tbody>
</table>

Table 3.9: Frequency of Selling to Food Distributors

<table>
<thead>
<tr>
<th>Food Distributor</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grocery Stores</td>
<td>26</td>
<td>32.91</td>
</tr>
<tr>
<td>Distributors/Wholesalers</td>
<td>18</td>
<td>22.78</td>
</tr>
<tr>
<td>Restaurants</td>
<td>35</td>
<td>44.30</td>
</tr>
</tbody>
</table>

**IV.2. Empirical Model Results**

For this study, the baseline producer was a small-scale specialty crop producer in the S-SARE region who does not participate in any state or regional agricultural marketing program. The overall probit regression estimation results and marginal effects results are presented in Tables 3.10 and 3.11. Overall, the probit model was statistically significant. In regards to the hypotheses testing, certain variables’ results such as food product liability insurance and traceability were unexpected. If a producer had a traceability system implemented, then there was no significant difference in their interest in selling to an institutional foodservice establishment. This result is somewhat surprising given it was hypothesized that if a producer already had a traceability system, then he/she would be more willing to sell to an institutional foodservice establishment with the reduction of this potential barrier. This result suggests that producers are interested in implementing traceability systems regardless of its connection to entering the institutional foodservice establishment marketing channel. Furthermore, producers who have acquired food product liability insurance were statistically less likely to be interested in selling to an institutional foodservice establishment. Specifically, these producers are roughly
49 percent more likely to not be interested in selling to an institutional foodservice establishment. Again, this result is somewhat surprising given the potential reduction in barriers to access institutional foodservice establishments with a food safety measure already implemented. This result suggests that producers who have implemented food product liability insurance are concerned for their own operations’ liabilities and are not concerned with using the food safety measure to enter into the marketing channel.

In considering farm income, it was originally hypothesized that producers with higher gross sales would be more interested in selling to an institutional foodservice establishment. According to the results, gross sales had no effect on the producer’s interested in selling into this market. In respects to producers’ participation in state marketing programs, only four of the state marketing programs were significant as compared to a producer who does not participate in one of the state marketing programs. Producers who participate in the Georgia Grown marketing program are roughly 81 percent more likely to not be interested in selling to an institutional foodservice establishment. As well, a producer who participates in the Make Mine Mississippi marketing program is roughly 74 percent more likely to not be interested in selling to an institutional foodservice establishment. At the 0.10 significance level, participation in Alabama’s and South Carolina’s state marketing programs is significant. Producers who participate in the Alabama Grown marketing program are roughly 32 percent more likely to be interested in selling to an institutional foodservice establishment while producers who participate in a South Carolina’s state marketing program are roughly 64 percent more likely to not be interested in selling to an institutional foodservice establishment. These results are fairly surprising that participation in a state agricultural marketing program had such a profound effect on a producer’s interest in selling to an institutional foodservice establishment. These results may
suggest that certain states’ institutional foodservice marketing channels may have already been explored and/or producers in these states are satisfied with the provided marketing by the state agricultural programs.

Finally in considering the hypotheses regarding established sales to institutional foodservice establishments, none of respondents were currently selling to an institutional foodservice establishment. However, producers who sold to food retailers such as distributors/wholesalers and restaurants were found to be interested in selling to an institutional foodservice establishment at the 0.05 significance level. Producers who sold to food distributors such as grocery stores were statistically significant at the 0.01 level. Specifically, producers were more likely to want to sell to an institutional foodservice establishment by 35 percent if they sell to a grocery store, 40 percent if they sell to a distributor/wholesaler, and 31 percent if they sell to a restaurant as compared to a producer who does not currently sell to a food retailer. These statistically significant results confirm that small-scale specialty crop producers in the S-SARE region who already have contracts with food distributors, retailers, and/or restaurants are interested in expanding their contracts with institutional foodservice establishments.

Other interesting variables that were statistically significant when added to the probit model were age of the respondent, gender of the respondent, and use of direct marketing techniques such as websites and online marketing through a third party. Age of the respondent was found to be statistically significant. Younger producers are 23 percent more likely to be interested in selling to an institutional foodservice establishment. In addition, males were 40 percent less likely to be interested in selling to an institutional foodservice establishment. Furthermore, use of direct marketing techniques, such as websites and online marketing through third parties, were statistically significant at the 0.05 level. For website marketing, producers
who use websites as a form of direct marketing are 33 percent more likely to be interested in selling to an institutional foodservice establishment while producers who use online marketing through third parties are roughly 59 percent more likely to not be interested in selling to an institutional foodservice establishment. All of these additional variables’ results could provide key information in regards to identifying potential small-scale specialty crop producers who would be willing to enter into a contractual agreement with an institutional foodservice establishment.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. error</th>
</tr>
</thead>
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<tr>
<td>Traceability</td>
<td>-0.352</td>
<td>0.400</td>
</tr>
<tr>
<td>Food Product Insurance</td>
<td>-1.446***</td>
<td>0.552</td>
</tr>
<tr>
<td>Business’s Age</td>
<td>0.003</td>
<td>0.204</td>
</tr>
<tr>
<td>Gross Sales</td>
<td>-0.211</td>
<td>0.213</td>
</tr>
<tr>
<td>Male</td>
<td>-1.347***</td>
<td>0.523</td>
</tr>
<tr>
<td>Age of Respondent</td>
<td>-0.693***</td>
<td>0.266</td>
</tr>
<tr>
<td>AL</td>
<td>2.336*</td>
<td>1.247</td>
</tr>
<tr>
<td>AR</td>
<td>1.164</td>
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</tr>
<tr>
<td>FL</td>
<td>-0.728</td>
<td>0.842</td>
</tr>
<tr>
<td>GA</td>
<td>-3.401***</td>
<td>1.321</td>
</tr>
<tr>
<td>KY</td>
<td>0.101</td>
<td>2.338</td>
</tr>
<tr>
<td>LA</td>
<td>-0.753</td>
<td>0.965</td>
</tr>
<tr>
<td>MS</td>
<td>-3.106**</td>
<td>1.420</td>
</tr>
<tr>
<td>NC</td>
<td>-0.225</td>
<td>0.776</td>
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<tr>
<td>OK</td>
<td>-0.781</td>
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<tr>
<td>SC</td>
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<td>1.125</td>
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<tr>
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<td>1.038</td>
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<td>Transportation</td>
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<td>0.487</td>
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<td>Infrastructure</td>
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<td>0.701</td>
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<tr>
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<tr>
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<td>Direct Marketing</td>
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<td>1.181</td>
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<td>Website</td>
<td>1.467**</td>
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<td>Online through 3rd Party</td>
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<tr>
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<td>2.072</td>
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Notes: *p<0.10, **p<0.05, ***p<0.01; n = 130
Dropped due to collinearity: VA, Specialty Crops, New to Channel, Schools, Hospitals, and Long-Term Care Facilities
<table>
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<tr>
<th>Variable</th>
<th>dy/dx</th>
<th>Std. error</th>
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<td>0.069</td>
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<td>Gross Sales</td>
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<td>0.072</td>
</tr>
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<td>Male</td>
<td>-0.397***</td>
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<td>Age of Respondent</td>
<td>-0.233***</td>
<td>0.090</td>
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<tr>
<td>AL</td>
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<td>Quantity/volume</td>
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<td>Quality</td>
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<td>0.279</td>
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<td>Online through 3rd Party</td>
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</tr>
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<td>Grocery Store</td>
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<td>Distributor/wholesaler</td>
<td>0.400***</td>
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<td>Restaurant</td>
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<td>0.111</td>
</tr>
<tr>
<td>Direct Sales</td>
<td>0.104</td>
<td>0.300</td>
</tr>
</tbody>
</table>

Notes: *p<0.10, **p<0.05, ***p<0.01; n = 130
Dropped due to collinearity: VA, Specialty Crops, New to Channel, Schools, Hospitals, and Long-Term Care Facilities
IV.2.1. General Barriers

After testing the hypotheses, further investigation was conducted into the reasons that current small-scale specialty crop producers in the S-SARE region do not currently sell to institutional foodservice establishments. All of the response choices were formulated and selected given the results from the previous qualitative study (Boys et al., 2012). The variables of quantity/volume required and certifications required were statistically significant at the 0.01 level. A producer who has concerns with the quantity required by an institution is 59 percent less likely to not be interested in selling to an institutional foodservice establishment. However, a producer who already has required certifications is roughly 45 percent more likely to still be interested in selling to an institutional foodservice establishment. Prices were also found to be statistically significant. A producer who has concerns with the price offered by institutional foodservice establishments being too low is 28 percent less likely to be interested in selling to an institutional foodservice establishment.

Overall, the logistic and food supply barriers of quantity and price too low in were found to negatively affect a producer’s interest in selling to an institutional foodservice establishment. Even with the food safety barrier of certifications required, small-scale specialty crop producers are more likely to be interested in selling to an institutional foodservice establishment; therefore this barrier does not deter producers’ interests in this marketing channel. These results can provide valuable information for future conservations between small-scale specialty crop producers and institutional foodservice establishments.
SECTION V: CONCLUSIONS

V.1. Key Findings

Overall, this study revealed important demographic characteristics, logistic, and food supply barriers faced by small-scale specialty crop producers in the S-SARE region that affected their interest in selling to institutional foodservice establishments. While none of the respondents were currently selling to institutional foodservice establishments, over 55 percent of the respondents were interested in selling in this market. There are, however, several potential barriers that will limit the ability of producers to serve this market. In regards to logistic and food supply barriers, quantity and pricing constraints were found to be significant deterrents for producers interest in this market. However, certifications requirements were not reported as a barrier to producer interest.

If a small-scale producer has implemented specific food safety requirements, such as traceability and food product liability insurance, these producers are still not interested in selling to an institutional foodservice establishment. This could be due to the costs or stipulations associated with their specific food product liability insurance plan. As well, producers involved in some state agricultural marketing programs are affected in regards to their interests in selling to institutional foodservice establishments. Lastly demographic characteristics of farm owners were found to be important to their interest in selling to institutional markets. Specifically, younger females were more likely to be interested in selling to institutional foodservice establishments. This information could be crucial in identifying the potential market of small-scale specialty crop producers that would be willing to sell to institutional foodservice establishments. Overall, this study provided valuable information in regards to demographic characteristics of interested producers, logistic and food supply barriers faced by producers, and the potential market of future contractual agreements between small-scale specialty crop
producers and institutional foodservice establishments in the S-SARE region. This important information could be helpful in providing insight into future contractual agreements between small-scale producers and institutional foodservice establishments. These results could facilitate conversations between producers, extension agents, and state marketing boards in regards to future workshops and distribution of informational materials that could help small-scale producers with overcoming these barriers.

V.2. Study Limitations
During the collection period, many producers were actively involved in the growing season, which may have hindered the number of responses. As well, some producers did not complete the entire survey, which limited the number of responses included in the finalized sample. As a result, producers who had implemented all food safety measures, experienced various logistic and food supply barriers, and established contracts with institutional foodservice establishments may not have fully completed the survey given the number of questions and time requirement.

V.3. Recommendations for Future Research
The marketing channel between institutional foodservice establishments and small-scale specialty crop producers is an important and growing market. Small-scale producers could substantially benefit from institutional foodservice establishments; however, logistic and food supply barriers faced by small-scale specialty crop producers needs to be further investigated. Additional questions in regards to marketing barriers were added to this study’s survey; however due to time constraints, results were not analyzed. As such, further analysis would be beneficial to better identify and understand specific marketing barriers faced by small-scale producers in the S-SARE region. As well, results from this study can be used to further investigate the influence of state agricultural marketing programs on selling to institutional foodservice
establishments. Furthermore, results from this study provide initiative for future research into the effects of implementing food safety measures such as traceability and food product liability insurance. While traceability and food product liability insurance are not required by regulation of small-scale producers, producers still implemented these food safety measures for their own safety. Therefore, further analysis is necessary in order to investigate the producers’ motivation for implementing these food safety measures if only for their own business’s safety.
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APPENDICES

Appendix B-1: Research Hypotheses

The study’s five hypotheses were mostly formulated based on previous literature. However due to the limited number of studies conducted on specialty crop producers and institutional foodservice establishments, some of the study’s hypotheses were created given agricultural producers’ characteristics and common requirements of institutional foodservice establishments. For example, the first hypothesis stated that small-scale specialty crop producers would be more interested in selling to institutional foodservice establishments if they have higher annual sales. According to Vogel (2012), “small farms accounted for over 90 percent of all farms reporting income from agritourism and direct-to-consumer sales of local foods.” Smaller farms largely use these direct marketing techniques to sustain their incomes; as a result, this study assumed that smaller income-generating farms’ would continue to focus on direct marketing techniques and would not be interested in selling to institutional foodservice establishments. Next, it was hypothesized that small-scale specialty crop producers would be more interested in selling to institutional foodservice establishments if they already sell to this type of an establishment. For this study, the institutional foodservice establishments considered were schools, hospitals, and long-term care facilities. Producers already selling to an institutional foodservice establishment were thought to face similar requirements when selling to another institutional foodservice establishment; as such, it was anticipated that these producers would be interested in selling to another institutional foodservice establishments. The next testable hypothesis stated that small-scale specialty crop producers would be more interested in selling to institutional foodservice establishments if they participate in state marketing programs. This study assumed that if a small-scale producer has passed state agricultural marketing
requirements, then the producer would be more interested in selling to an institutional foodservice establishment. As well, the study hypothesized that small-scale specialty crop producers would be more interested in selling to institutional foodservice establishments if they had a traceability system. Given that institutional foodservice establishments are concerned about high levels of risk for foodborne illness, these buyers are interested in contracting with farmers who have traceability systems (Martinez et al., 2010). As a result, this study assumed that if a producer already had a traceability system implemented, then the producer would be more interested in selling to an institutional foodservice establishment due to the reduction in potential barriers. Lastly, a requirement set by institutional foodservice establishments in order to manage liability concerns is food product liability insurance (Johnson & Stevenson, 1998). Therefore like hypothesis (4) this study assumed that a small-scale specialty crop producer that had food product liability insurance would be more interested in selling to an institutional foodservice establishment due to the reduction in potential barriers faced.
Appendix B-2: Producer Survey

Agreement to be in a Research Study
Virginia Tech
Linking Specialty Crop Producers and Institutional Food Services:
Food Safety Concerns and Considerations

According to the Specialty Crops Competitiveness Act of 2004, specialty crops are defined as “fruits and vegetables, tree nuts, dried fruits, horticulture, and nursery crops (including floriculture). Eligible plants must be intensively cultivated and used by people for food, medicinal purposes, and/or aesthetic gratification to be considered specialty crops. Processed products shall constitute greater than 50% of the specialty crop by weight, exclusive of added water.”

This study explores the potential barriers faced by specialty crops producers to access contractual agreements with foodservice institutions such as hospitals, schools, long-term care facilities, etc. The project’s main focus is to identify the barriers faced by these producers in the Southern Sustainable Agriculture Education & Research (SARE) region. As well, the project hopes to improve the awareness of the barriers faced by specialty crop producers.

As a specialty crop producer in the Southern-SARE region, your feedback is greatly needed! Please help me by answering questions on the following survey; it is expected that completing this survey will take more than 15 minutes.

Your participation is voluntary. All information that is collected will be kept strictly confidential. Neither your, nor your organization’s, name will be collected. Please complete this survey by April 1, 2013. Your identifying information will be kept anonymous and confidential. If you have questions about the survey or any problems arise, please do not hesitate to contact me, Katie DuBreuil (dubreuil@vt.edu) or Dr. Kathryn Boys (kboys@vt.edu). If you have any questions about your rights as a research participant, please contact the Virginia Tech Institutional Review Board at moored@vt.edu or (540) 231-4991.

Thank you in advance for your participation!

Do you consent to participating in this survey?
INTRODUCTION
1. Where is your farm located?

State: ____________________
County: __________________

PRODUCTION
2. Do you participate in any state marketing programs? (Check all that apply)

Alabama:  
- Alabama A+

North Carolina:  
- North Carolina Farm Fresh
- Goodness Grows in North Carolina

Arkansas:  
- Arkansas Grown

Oklahoma:  
- Made in Oklahoma

Florida:  
- Fresh from Florida

South Carolina:  
- Certified South Carolina Grown
- Fresh on the Menu

Georgia:  
- Georgia Grown

Kentucky:  
- Kentucky Proud

Tennessee:  
- Pick Tennessee Products

Louisiana:  
- Louisiana Grown

Texas:  
- Go Texan

Mississippi:  
- Make Mine Mississippi

Virginia:  
- Virginia Grown

- Other: ________________________
- Other: ________________________
- Other: ________________________

3. What special production practices and/or certifications has your farm received? (Check all that apply)

- Good Agricultural Practices (GAPs) certification
- Certified Organic
- Transitioning to Organic
- Green Certifications (i.e. Certified Naturally Grown)
- Other: __________________________
- Other: __________________________
- Other: __________________________
- None
4. What items do you produce on your farm?

- Field/Row Crops
- Hay and Forage Crops
- Woodland Crops
- Specialty Crops (Fruits, Vegetables, Tree Nuts, Nursery/Greenhouse)
- Livestock and Animal Products
- Aquaculture
- Poultry and Eggs

If you produce specialty crops, continue to Question 5.
If you do NOT produce specialty crops, skip to Question 26.

5. What types of specialty crops does your farm produce? (Check all that apply)

- Fruits and/or Tree Nuts
- Vegetables
- Herbs and/or Spices
- Nursery, Floriculture, and/or Horticulture Crops
- We do not produce any specialty crops

If Fruits and/or Tree Nuts, continue to Question 6.
If Vegetables, skip to Question 7.
If Herbs, skip to Question 8.
If Nursery, Floriculture, Horticulture crops, skip to Question 9.

6. What types of Fruit and/or Tree Nuts does your farm produce? (Check all that apply)

- Almonds
- Apples
- Apricots
- Avocados
- Blackberries
- Blueberries
- Citrus
- Grapes (including raisins)
- Olives
- Peaches
- Plums
- Raspberries
- Strawberries
- Watermelons
- Other: ___________
- Other: ___________
- Other: ___________
- Other: ___________

7. What types of Vegetables does your farm produce? (Check all that apply)

- Beans
- Broccolis
- Cabbages
- Chives
- Collards
- Cucumbers
- Eggplants
- Leafy Greens
- Leeks
- Melons
- Mushrooms
- Okra
- Onions
- Peas
- Peppers
- Potatoes
- Pumpkins
- Radishes
- Squash
- Sweet Corn
- Sweet Potatoes
- Tomatoes
- Turnips
- Other:
- Other:
8. What types of **Herbs (culinary, medicinal) and/or Spices** does your farm produce? *(Please list all produced)*  

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

9. What types of **Nursery, Floriculture, or Horticulture** crops does your farm produce? *(Check all that apply).*

- Annual bedding plants
- Broadleaf evergreens
- Christmas trees
- Cut cultivated flowers
- Cut flowers
- Deciduous flowering trees
- Deciduous shade trees
- Deciduous shrubs
- Foliage plants
- Landscape shade trees
- Landscape Conifers
- Potted flowering plants
- Potted herbaceous perennials
- Turfgrass
- Other:

__________________________________________________________________________

__________________________________________________________________________

MARKETING ACTIVITIES

10. Do you do any value added processing of fruits and vegetables?  

- Yes
- No

11. What percentage of your produce do you sell through each of the following marketing channels? *(Place X with corresponding appropriate percentage)*

<table>
<thead>
<tr>
<th>PERCENTAGE</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
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</thead>
<tbody>
<tr>
<td>Farmers’ Market</td>
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<td>Roadside Stand</td>
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<tr>
<td>Pick your Own</td>
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<td>Community Supported</td>
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<tr>
<td>Agriculture (CSA)</td>
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<td>Online Through own website</td>
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<td>Online Through 3rd party website</td>
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<tr>
<td>Sell directly to grocery stores (i.e. Supermarket)</td>
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<tr>
<td>Sell directly to Distributors/or wholesalers</td>
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<tr>
<td>Sell directly to Restaurant(s)</td>
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<td>Sell directly to School(s)</td>
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<tr>
<td>Sell directly to Hospital(s)</td>
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<tr>
<td>Sell directly to long-term care facility</td>
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<tr>
<td>Sell through other channel Describe:</td>
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<tr>
<td>Sell through other channel: Describe:</td>
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</tbody>
</table>

12. Marketing activities can include: preparing products for sale, transporting products to and from a sales venue, selling area set-up and tear down, actual time for and interacting with customers?

During harvest season, how many hours per week do you spend on marketing activities?
Farmers’ Market: ____________ hours per week
Roadside Stand: _____________ hours per week
Pick your own: ______________ hours per week
Community Supported Agriculture (CSA): ________________ hours per week
Online through own site: ______________________ hours per week
Online through 3rd party site: ____________________ hours per week
Sell directly to grocery stores: __________________ hours per week
Sell directly to distributor/wholesaler: ________________ hours per week
Sell directly to restaurant(s): _____________________ hours per week
Institutional food services include schools, hospitals, and long-term care facilities.

13. Institutional food services often require additional processing and/or packaging. If you have been in contact with any institutional food service, please indicate what value-added processing was requested.

<table>
<thead>
<tr>
<th>Value-Added Requirements</th>
<th>Have needed equipment</th>
<th>Have Access to needed equipment</th>
<th>Need Access to equipment</th>
<th>Not Interested in providing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

If you sell to schools, hospitals, long-term facilities, or other institutional buyers, continue to Question 14.
All other options, skip to Question 15.

14. What, if any, challenges have you experienced when selling directly to an institutional food service? (After describing the challenge, please place an “X” corresponding to the relevant institution type(s))

<table>
<thead>
<tr>
<th>Challenges</th>
<th>School(s)</th>
<th>Hospital(s)</th>
<th>Long-Term Care Facility</th>
<th>Other Institution Type:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
Once filled out:
If you sell to schools: skip to Question 18.
If you sell to hospitals: skip to Question 20.
If you sell to long-term care facility, skip to Question 22.
If you sell to other institutional food buyers, skip to Question 24.

Institutional food services include schools, hospitals, and long-term care facilities.

15. Would you be willing to sell to an institutional food market?
   ☐ Yes
   ☐ No

16. Why do you not currently sell directly to an institution? (Check all that apply)
   ☐ Previously did sell to an institution and had a bad experience
   ☐ Unable to provide required quantity/volume
   ☐ Unable to consistently provide required quality
   ☐ Unable to transport product to buyer
   ☐ Price received for product is too low
   ☐ Lack of infrastructure to provide required value-added processing
   ☐ Payment arrangements (e.g., wait time to receive payments)
   ☐ Do not have required certification(s)(e.g., GAPs)
   ☐ Unwilling to sign a contract
   ☐ Unable to make needed contacts with an institution
   ☐ Other: __________________________
If answered “previously did and had a bad experience, continue to Question 17.  
For all others, skip to Questions 26.

17. You noted that you did sell to an institution and had a bad experience. What caused this relationship to end?

________________________________________________________________________________________
________________________________________________________________________________________

Once completed, skip to Question 26.

SELL DIRECTLY TO SCHOOL(S)

18. How did you initially establish a relationship with the school and/or school board?

________________________________________________________________________________________.

19. Do the school(s) you sell to require you to carry food product liability insurance?
   ❑ Yes
   ❑ No
   ❑ Don’t know/Unsure
   ❑ Prefer not to respond

   If Yes, what amount (in dollars) of coverage do they require?

________________________________________________________________________________________

SELL DIRECTLY TO HOSPITAL(S)

20. How did you initially establish a relationship with the hospital(s)?

________________________________________________________________________________________.

21. Do the hospital(s) you sell to require you carry food product liability insurance?
   ❑ Yes
   ❑ No
   ❑ Don’t know/Unsure
   ❑ Prefer not to respond

   If Yes, what amount of coverage do they require?

________________________________________________________________________________________

SELL DIRECTLY TO LONG-TERM CARE FACILITY
22. How did you initially establish a relationship with the long-term care facility?

________________________________________________________________________

23. Do the long-term care facility you sell to require you to carry food product liability insurance?
   - Yes
   - No
   - Don’t know/Unsure
   - Prefer not to respond

If Yes, what amount of coverage do they require?

________________________________________________________________________

SELL DIRECTLY TO OTHER INSTITUTIONAL FOOD BUYER(S)

24. How did you initially establish a relationship with this institutional food buyer(s)?

________________________________________________________________________

25. Do the institutional buyer(s) you sell to require you to carry food product liability insurance?
   - Yes
   - No
   - Don’t know/Unsure
   - Prefer not to respond

If Yes, what amount of coverage do they require?

________________________________________________________________________

TRACEABILITY

According to the US Food and Drug Administration, “product tracing system involves documenting the production and distribution chain of products so that in the case of an outbreak or evidence of contaminated food, a product can be traced back to a common source or forward through distribution channels.”

26. Does your farm have a traceability system in place?
   - Yes
   - No

If yes, continue to Question 27.
If no, skip to Question 37.
27. Is traceability mandatory for you?
- Yes
- No
- Don’t know/Unsure

28. What initially influenced your decision to implement your traceability system? *(Check all that apply)*
- Buyer requested
- Buyer required
- Government regulation
- Collecting information regarding yield/quality
- Increase selling price
- Lower operating costs
- Firm reputation
- Concerns about liability
- Adds value to product
- Distinguish product from competitors
- Other: ______________________
- Other: ______________________

29. When did you implement your traceability program?
- 1995
- 1996
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
30. What approach do you use in your traceability system? *Check all that apply.*
- Bar code system
- Radio-Frequency Identification (RFID) labels
- Own system
  
  Please Describe: ___________________________________________

- Other: __________________________

31. How many additional hours per week are needed to collect and maintain the documentation required for your traceability system?

   Hours per week: __________________

32. What resources have you used to implement and maintain your traceability system? *Check all that apply*
- Purchase/upgrade computer software for record keeping
- New infrastructure (e.g. buildings)
- New equipment purchases
- Additional employee time
- Hired consultants

- Other: __________________________

- Other: __________________________

- Other: __________________________

33. What information do you keep track of? *Check all that apply*
- Number
- Date picked
- Time picked
- Employee harvest identification
- Box/carton/crate number

- Other: __________________________

34. In what format do you keep your traceability records? *Check one*
- Paper
- Electronic
- Combination of paper and electronic

- Other: __________________________

35. In total, how much did it cost for you to implement your traceability system? Please consider equipment, supplies, and human resource costs.

   $______________________________
36. In total, how much does it cost for you to maintain your traceability system? Please consider supplies and human resource costs.

$____________________________________________

37. Please indicate how much you agree or disagree with the following statements (Place an “X” to designate your answer)

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Don’t Know</th>
<th>Prefer to not respond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementing traceability improves efficiency in the production process.</td>
<td></td>
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</tr>
<tr>
<td>Implementing traceability increases the organization’s reputation.</td>
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</tr>
<tr>
<td>Implementing traceability increases the cost of production.</td>
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<tr>
<td>Implementing traceability limits liability concerns.</td>
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<tr>
<td>Implementing traceability adds value to the product.</td>
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<tr>
<td>Implementing traceability allows for ability to pinpoint quality characteristics.</td>
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</tr>
</tbody>
</table>
38. Do you think implementing a traceability system should be mandatory?
   - Yes
   - No
   - Don’t know/Unsure

   **If you do NOT have a traceability program, continue to Question 39.**
   **If you have a traceability program, skip to Question 42.**

39. Do you expect that you will implement a traceability system? (Check one)
   - Do not plan to implement
   - In the process of implementing
   - Less than 2 years
   - 3-5 years
   - 6-10 years
   - More than 10 years
   - Don’t know / have not considered

   **If you expect to implement, continue to Question 40.**
   **If don’t expect to implement, skip to Question 41.**

40. Why do you plan to implement a traceability program in the future? *(Check all that apply)*
   - Buyer requested
   - Buyer required
   - Government regulation
   - Collecting information regarding yield/quality
   - Increase selling price
   - Lower operating costs
   - Firm reputation
   - Concerns about liability
   - Adds value to product
   - Distinguish product from competitors
   - Other: ______________________
   - Other: ______________________

   **Once completed, skip to Question 42.**

41. Why have you decided NOT to implement a traceability program? *(Check all that apply)*

   ____________________________________________
FOOD PRODUCT LIABILITY INSURANCE

Food product liability insurance provides some protection for producers in the event that an insured food product insured causes injury to a user.

42. Do you have food product liability insurance?
   □ Yes
   □ No

   **If yes, continue to Question 43.**
   **If no, skip to Question 48.**

43. What initially influenced your decision to purchase food product liability insurance?

   *(Check all that apply)*
   □ Buyer requested
   □ Buyer required
   □ Government regulation
   □ Increase selling price
   □ Lower operating costs
   □ Firm reputation
   □ Concerns about liability
   □ Adds value to product
   □ Distinguish product from competitors
   □ Other: ______________________
   □ Other: ______________________

44. How much food product liability insurance coverage do you have?

   $______________________________________________

45. What, if any, challenges did you experience in searching for and purchasing food product liability insurance?

   ________________________________________________
   ________________________________________________
   ________________________________________________

46. How many insurance companies did you approach about purchasing food product liability insurance?
Insurance companies approached: __________________________

47. Of the insurance companies you approached, how many were able to sell you the insurance product?

Insurance companies able to sell: __________________________

48. Please indicate the extent you agree with the following statements (Place an “X” to designate your answer)

<table>
<thead>
<tr>
<th>Purchasing food product liability insurance...</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Don’t Know</th>
<th>Prefer to not respond</th>
</tr>
</thead>
<tbody>
<tr>
<td>improves access to markets</td>
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<td></td>
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<td></td>
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<tr>
<td>improves firm’s reputation</td>
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<td>decreases litigation concerns</td>
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<tr>
<td>adds value to the product</td>
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<tr>
<td>helps distinguish me from my competitors</td>
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<tr>
<td>is necessary in today’s business environment</td>
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</tr>
</tbody>
</table>

49. Do you think purchasing food product liability insurance should be mandatory?
   - Yes
   - No
   - Don’t know/Unsure

   **If you do NOT have food product liability insurance, continue to Question 50.**
   **If you have food product liability insurance, skip to Question 53.**

50. Do you expect that you will purchase food product liability insurance? (Check one)
Do not plan to implement
In the process of implementing
Less than 2 years
3-5 years
6-10 years
More than 10 years
Don’t know / have not considered

If you expect to implement, continue to Question 51.
If don’t expect to implement, skip to Question 53.

If yes, continue to Question 51.
If no, skip to Question 53.

51. Why do you plan to purchase food product liability insurance in the future? (Check all that apply)
- Buyer requested
- Buyer required
- Government regulation
- Increase selling price
- Lower operating costs
- Firm reputation
- Concerns about liability
- Adds value to product
- Distinguish product from competitors
- Other: ______________________
- Other: ______________________

Once completed, skip to Question 54.

52. Why have you decided NOT to purchase food product liability insurance? (Check all that apply)

_______________________________________________________
_______________________________________________________
_______________________________________________________
_______________________________________________________

ABOUT YOU AND YOUR BUSINESS

53. What is your position in the operation? (Check one)
- Senior Management
- Middle/Junior Management
- Administrative Staff
- Support Staff
- Hired Labor
- Intern/Volunteer
- Other: ______________________
54. How many years has your farm been in operation? (Check one)
   - Less than a year
   - 1-5 years
   - 6-10 years
   - 11-19 years
   - Over 20 years
   - Prefer not to respond

55. How many employees are employed at your operation?
   Number of Employees

<table>
<thead>
<tr>
<th></th>
<th>Full Time</th>
<th>Part Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year-round</td>
<td>_________</td>
<td>_________</td>
</tr>
<tr>
<td>Seasonal</td>
<td>_________</td>
<td>_________</td>
</tr>
</tbody>
</table>

56. How many acres do you currently have in production?

<table>
<thead>
<tr>
<th>Specialty crops</th>
<th>Row Crops</th>
<th>Livestock</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres</td>
<td>_________</td>
<td>_________</td>
<td>_______</td>
</tr>
<tr>
<td>in production</td>
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</tbody>
</table>

57. What is the approximate gross annual revenue of your organization? (Check one)
   - Less than $1,000
   - $1,000 – $9,999
   - $10,000 - $49,999
   - $50,000 - $99,999
   - $100,000 - $174,999
   - $175,000- $249,999
   - Prefer not to respond

58. What is your gender? (Check one)
   - Male
   - Female

59. What is your age? (Check one)
   - 18-24 years
   - 25-39 years
   - 40-59 years
   - 60-69 years
☐ Over 70 years
☐ Prefer not to respond

60. Do you have any further comments, suggestions, or feedback?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Thank you for participating in this survey. Your responses will help us provide a better understanding of the specialty crop producer to institutional food service marketing channel.

We greatly appreciate your time and feedback!
### Appendix B-3: Descriptions of Explanatory Variables

#### Table 3.4: Descriptions of Explanatory Variables

<table>
<thead>
<tr>
<th>Explanatory Variable</th>
<th>Description</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traceability</td>
<td>Dummy =1 if have traceability system</td>
<td>0</td>
<td>1</td>
<td>0.361</td>
<td>0.482</td>
</tr>
<tr>
<td>Food Product Insurance</td>
<td>Dummy=1 if have food product liability insurance</td>
<td>0</td>
<td>1</td>
<td>0.392</td>
<td>0.490</td>
</tr>
<tr>
<td>Business’s Age</td>
<td>How many years the farm has been operation</td>
<td>2</td>
<td>5</td>
<td>3.515</td>
<td>1.176</td>
</tr>
<tr>
<td></td>
<td>1= Less than one year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2= 1-5 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3= 6-10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4= 11-19 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 = Over 20 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 = Prefer to not respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Sales</td>
<td>Annual gross revenue from farm</td>
<td>1</td>
<td>6</td>
<td>3.177</td>
<td>1.332</td>
</tr>
<tr>
<td></td>
<td>1= Less than $1,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = $1,000 – $9,999</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = $10,000 - $49,999</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 = $50,000 - $99,999</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 = $100,000 - $174,999</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 = $175,000- $249,999</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>Dummy=1 if male</td>
<td>0</td>
<td>1</td>
<td>0.608</td>
<td>0.490</td>
</tr>
<tr>
<td>Age of Respondent</td>
<td>Age of participant</td>
<td>1</td>
<td>6</td>
<td>3.308</td>
<td>0.947</td>
</tr>
<tr>
<td></td>
<td>1 = 18-24 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = 25-39 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = 40-59 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 =  60-69 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 = Over 70 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 = Prefer not to respond</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AL</td>
<td>Dummy=1 if participate in Alabama state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.062</td>
<td>0.241</td>
</tr>
<tr>
<td>AR</td>
<td>Dummy=1 if participate in Arkansas state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.046</td>
<td>0.211</td>
</tr>
<tr>
<td>FL</td>
<td>Dummy=1 if participate in Florida state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.115</td>
<td>0.321</td>
</tr>
<tr>
<td>GA</td>
<td>Dummy=1 if participate in Georgia state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.092</td>
<td>0.291</td>
</tr>
<tr>
<td>KY</td>
<td>Dummy=1 if participate in Kentucky state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.046</td>
<td>0.211</td>
</tr>
<tr>
<td>LA</td>
<td>Dummy=1 if participate in Louisiana state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.062</td>
<td>0.241</td>
</tr>
<tr>
<td>MS</td>
<td>Dummy=1 if participate in Mississippi state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.031</td>
<td>0.173</td>
</tr>
<tr>
<td>NC</td>
<td>Dummy=1 if participate in North Carolina state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OK</td>
<td>Dummy=1 if participate in Oklahoma state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.46</td>
<td>0.211</td>
</tr>
<tr>
<td>SC</td>
<td>Dummy=1 if participate in South Carolina state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.100</td>
<td>0.301</td>
</tr>
<tr>
<td>TN</td>
<td>Dummy=1 if participate in Tennessee state agricultural marketing program</td>
<td>0</td>
<td>1</td>
<td>0.092</td>
<td>0.291</td>
</tr>
<tr>
<td>TX</td>
<td>Dummy=1 if participate in Texas state</td>
<td>0</td>
<td>1</td>
<td>0.10</td>
<td>0.301</td>
</tr>
<tr>
<td>Dummy Variable</td>
<td>Description</td>
<td>Coefficient (SE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VA</td>
<td>Dummy=1 if participate in Virginia state agricultural marketing program</td>
<td>0.062 (0.241)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialty Crop Producer</td>
<td>Dummy=1 if specialty crop producer</td>
<td>0.062 (0.241)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bad Experience</td>
<td>Dummy=1 if do not currently sell to an institutional foodservice establishment because has a previous bad experience</td>
<td>0.023 (0.151)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity/volume</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to quantity/volume required</td>
<td>0.469 (0.500)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to quality required</td>
<td>0.131 (0.338)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to inability to transport product to buyer</td>
<td>0.077 (0.268)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price too Low</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to price received is too low</td>
<td>0.415 (0.495)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to lack of infrastructure for value-added processing</td>
<td>0.208 (0.407)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payment Arrangement</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to payment arrangements</td>
<td>0.085 (0.280)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Required Certifications</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to required certifications</td>
<td>0.246 (0.434)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Didn’t Sign Contract</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to unwilling to sign a contract</td>
<td>0.100 (0.301)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unable to Contact</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to inability to make contact</td>
<td>0.138 (0.347)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Interested</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to no interest</td>
<td>0.131 (0.338)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New to Channel</td>
<td>Dummy = 1 if do not currently sell to an institutional foodservice establishment due to this survey is the first time heard of this marketing channel</td>
<td>0.000 (0.000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Marketing</td>
<td>Dummy = 1 if direct marketing through a farmers’ market, CSA, Pick-your-own, or roadside stand.</td>
<td>0.162 (0.369)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Website</td>
<td>Dummy = 1 if direct market through a website.</td>
<td>0.162 (0.369)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy</td>
<td>1 if direct market through online resources provided by a third party</td>
<td>0</td>
<td>1</td>
<td>0.069</td>
<td>0.255</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>Grocery Store</td>
<td>Dummy = 1 if currently sell to a grocery store</td>
<td>0</td>
<td>1</td>
<td>0.200</td>
<td>0.402</td>
</tr>
<tr>
<td>Distributor/wholesaler</td>
<td>Dummy = 1 if currently sell to a distributor/wholesaler</td>
<td>0</td>
<td>1</td>
<td>0.138</td>
<td>0.347</td>
</tr>
<tr>
<td>Restaurant</td>
<td>Dummy = 1 if currently sell to a restaurant</td>
<td>0</td>
<td>1</td>
<td>0.269</td>
<td>0.445</td>
</tr>
<tr>
<td>School</td>
<td>Dummy = 1 if currently sell to a school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hospital</td>
<td>Dummy = 1 if currently sell to a hospital</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Long-Term Care Facility</td>
<td>Dummy = 1 if currently sell to a long term care facility</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Direct Sales</td>
<td>Dummy = 1 if currently sell through direct sales</td>
<td>0</td>
<td>1</td>
<td>0.031</td>
<td>0.173</td>
</tr>
</tbody>
</table>

n=130 observations
CHAPTER IV: Research Conclusions

IV.1. Overall Study Findings

This study sought to explore the potential of two innovative marketing approaches for small farms and agribusinesses in the United States. The first marketing approach technique, AgCache, provides small farms an opportunity to market their businesses through agritourism and the game of geocaching. Given the results from Chapter II, agribusinesses who are involved in retailing are most likely to be interested in the AgCache program. As a result, the AgCache creators can create a new marketing strategy and materials specifically for retailers involved in the agricultural industry. As well, the creators can also target their marketing strategies towards male owners and/or senior level managers who are already active in using advertising techniques for their agribusinesses. With strong recommendations from current sites and forthcoming marketing materials, the AgCache program would be a beneficial investment for these types of agribusinesses.

The second marketing approach, marketing specialty crops through institutional foodservice establishment contracts, provides small-scale specialty crops producers the opportunity to establish contractual agreements with schools, hospitals, and long-term care facilities. While this marketing channel can provide new income opportunities for small-scale producers, there are still logistic and food supply barriers faced by these producers, which limit their interest in pursuing contracts. With requirements such as large quantities demanded and low prices, small-scale producers are deterred from contracting with these institutional foodservice establishments. However, even with none of the producers currently selling to institutional foodservice establishments, over 55 percent stated they would still be interested. Small-scale producers who have established contracts with food distributors such as grocery stores, distributors/wholesalers, and restaurants are still interested in selling to institutional foodservice
establishments. Therefore even with the logistic and food supply barriers faced by these small-scale specialty crops producers in the S-SARE region, this potential marketing approach can still be a potential marketing approach for small-scale farms.

IV.2. Contributions and Policy Implications of Study

The two potential marketing approaches explored in this study can provide both contributions to agribusinesses, small farms, and rural communities as well as begin the process for potential policy reforms.

IV.2.1. Rural Economic Development

Each of the examined marketing approaches not only support the small farmer, but also provide potential strategies for economic stability in rural areas. Agritourism and agricultural industry growth through institutional foodservices contracts can help offset valuable solutions to the unemployment and declines in household income seen recently in rural areas. Through increases in touristic activities as reported in the AgCache chapter, and potential revenue increases from institutional foodservices contracts as illustrated in Chapter III, small farms who wish to do so can hopefully prosper into middle sized farms. The net impact of this is to support rural economic development.

Rural economic development can be further substantially improved if appropriate policies and measures are implemented. For instance, support for agritouristic activities and tax-based incentives for institutional foodservice establishments who serve local food products could easily facilitate the implementation of the two marketing approaches. Community and governmental support are crucial components to any rural economic development strategy.

IV.2.2. U.S. Agribusinesses

Data collected and analyzed for these studies was drawn from the Southeastern US. Despite the geographic focus, both approaches can be implemented across the US. Both
marketing approaches are recommended for US agribusinesses and can provide valuable information and insight that would be useful to consider in future decision-making about marketing strategies. In order to continue the success of the agricultural industry, US agribusinesses need to support and actively communicate with each other about innovative marketing techniques, such as the ones proposed in this study. Communication methods such as email distributions, websites/blogs, and/or newsletters could be used to connect these agribusinesses about the marketing techniques.

IV.3. Recommendations for Future Research
   The results from this study provide additional insight into innovative marketing approaches for US farms and agribusinesses. Specifically, this study investigates two potential marketing approaches for small farms and agribusinesses through agritourism and institutional foodservice establishment marketing channel. Both marketing approaches were statistically significant in regards to current small farms and agribusinesses being interested in adopting these approaches as alternatives or additions to their current marketing options. The analysis from this study could be expanded by analyzing the approaches across various regions of the United States. As well, the marketing approaches could be analyzed with medium-scale farms in order to investigate the versatility of the two marketing approaches. In addition, specific agricultural sectors or types of agribusinesses could be evaluated to further analyze the potential interest in the two marketing approaches.