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## Preferences of Louisiana agronomic crop producers and crop consultants regarding sources of information related to agricultural production

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PREFERENCES OF LOUISIANA AGRONOMIC CROP PRODUCERS AND CROP  
CONSULTANTS REGARDING SOURCES OF INFORMATION RELATED TO  
AGRICULTURAL PRODUCTION

A Dissertation

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

in

The School of Human Resource Education and Workforce Development

by  
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## **ABSTRACT**

The dissemination of information related to agronomic crop production is crucial to the success of the agriculture industry in Louisiana. This information is distributed by various sources and through multiple methods.

The primary purpose of this study was to determine the preferences of Louisiana agronomic crop producers and crop consultants in regard to acquiring information related to their agricultural operations. A secondary purpose was to determine how agronomic crop producers perceived selected LSU AgCenter information sources on accuracy, awareness and frequency of use.

Data for the study were obtained through surveys completed by 176 agronomic crop producers and 32 crop consultants. The data were analyzed to determine perceptions of the two groups of various information sources on issues of usefulness, frequency of use and the preferences to particular sources. The participants' perceptions of selected LSU AgCenter information sources were also analyzed for awareness, frequency of use and accuracy.

The majority of agronomic crop producers were white (99.4%). Their average age was 48.6 years, and they had been farming agronomic crops for an average of 25.2 years. The majority of the crop consultants in the study were white (100%), male (96.9%) and college graduates (96.9%).

The findings indicated that both groups actively used many of the information sources featured in the study. Consultants were the most preferred source for agronomic crop producers followed closely by sources affiliated with the LSU AgCenter. For

consultants, LSU AgCenter personnel were the most preferred source followed closely by other crop consultants and LSU AgCenter print materials.

Both groups had a similar preference toward interpersonal information sources. Mass media sources were scored lower by both groups. Because both groups had a preference for interpersonal communication, organizations that plan to communicate with these two groups should include an interpersonal communication component in any information campaigns.

Additionally, it is important for a source to be perceived by agronomic crop producers as one that disseminates accurate information. According to producers, accuracy is a crucial characteristic in terms of the usage of an information source.

# CHAPTER ONE

## INTRODUCTION

### **Justification/Rationale**

Americans have an insatiable appetite for goods and services. One commodity that is in great demand and which Americans crave is information. In today's information age, people have a strong desire to acquire the latest news on a wide variety of topics ranging from political news to the results of major sporting events.

Americans are willing to invest a large amount of their time obtaining news information. On average, people across the country dedicate more than an hour a day to finding the latest news with television being the dominant method of delivery followed by radio and then newspapers (people-press.org, 2010).

Just as there is high demand for information, Americans can acquire this information from a multitude of methods such as newspapers, magazines, television and the Internet. The formats of newspapers and radio are still popular options, but cable television, satellite radio, and the World Wide Web are gaining considerably in popularity. Diddi and LaRose (2006) reported that people under the age of 30 rely on cable networks for their news which represents a generational shift from older individuals who relied on either network television or publications for their news.

The number of television channels available has been increasing for years as more and more specialized programming becomes available. In 2008, the average number of channels received in a U.S. home was 130.1, an increase of more than 11 channels from the previous year (Nielsen, 2009). This figure represents a dramatic increase from the 18.8 channels received in 1985, the first year Nielsen began tracking the number of

channels, and the 41.1 channels delivered in 1995. The number of channels has increased every year except in 2004 (Nielsen, 2009).

While there has been a growth in the number of networks in the last 20 years, many of the newer channels are in response to the growing popularity of cable and satellite television. In 1976, there were four national cable networks. By 1984, 48 such networks existed, and by 1999 there were 214 national cable networks (Toto, 2000). Networks such as the Cable News Network (CNN), Black Entertainment Television (BET), and the Entertainment and Sports Programming Network (ESPN) are examples of networks born under the cable umbrella. Because of the popularity of these networks and with the advent of direct-to-home satellite services, these networks are part of programming packages offered by satellite-provided programming services such as Dish Network and Direct-TV (Toto, 2000).

Satellite radio is a more recent phenomenon with its launch in late 2001. By 2005, the number of subscribers had grown to more than five million. (Manly, 2005). Most subscribers were drawn to the specialized or custom content provided by satellite radio. With the merger of the two main providers, XM Radio and Sirius in 2008, subscribers now number more than 19.5 million (orbitcast.com, 2010).

The popularity of newspapers has experienced a downward trend. In 1940 there were 1878 daily newspapers in the United States. In 2009, the number had dropped to 1387 daily newspapers. Circulation numbers have followed this downward trend. Circulation numbers peaked in 1973 with more than 63 million subscribers. In 2009, subscribers numbered slightly more the 45.6 million. Circulation numbers have fallen every year since 1988 (Newspaper Association of America, 2010).

Newspapers remain a reliable source of information for most Americans regarding news and public affairs. Individuals who read newspapers on a regular basis are more informed in the arena of news and public affairs (Robinson & Levy, 1996). An alarming trend found by Robinson and Levy's research is that with declining readership individuals are becoming less informed despite having more sources of information available to them.

With the increase of computer usage in both the home and work environments and the ownership of smartphones growing, the use of the Internet has become a common tool used in acquiring information. In a December 2010 survey, the Pew Internet and American Life Project found that 77% of adults in the United States were Internet users. Nearly 90% of these users were actively seeking information. Seventy-eight percent of the users reported the Internet as a source for getting news information (pewinternet.org, 2010).

Not only is the Internet a widely used source, it is a dependable source. Sixty percent of Internet users stated they were "very successful" in finding the information they were searching for on the Internet (Rainie, Estabrook,& Witt, 2007). Couple this fact with the 29 % who reported they were "somewhat successful" and nearly 90 % of Internet users reported a successful search for information via the Internet.

An issue to consider is whether a particular audience or population would have similar results as those found in the Pew study. Does an individual's occupation influence the sources and channels through which information is sought? For example, would the sources and channels used by those involved in medical professions differ from those engaged in agricultural enterprises? Just as the general populace has many avenues for information, today's agricultural producers enjoy access to a multitude of

sources. These producers must filter through large quantities of information to determine what products to use in their operations or what techniques to implement to make their undertakings more successful.

### **The Role of Agronomic Crop Production**

The United States of America is fortunate enough to have one of the most abundant, safest and varied food sources in the world (Kantor, Lipton, Manchester, & Oliveria, 1997). Because of this abundance, Americans spend far less of their income on food than many other developed nations.

One reason for America's plentiful food supply is that its heritage includes a strong agricultural component. Historical accounts of the Pilgrims' early experience with agriculture and the first Thanksgiving document the significance of agriculture in early America. Some would argue that the cultivation of crops had begun long before the arrival of the Pilgrims and had been practiced by the Native Americans who inhabited the continent for many centuries (Cochrane, 1993). Regardless, agriculture is an important element in American culture. It supplies the food for the country's tables, the resources for building homes and the fibers for the clothes that are worn at work or play.

Just how important is agriculture to the American economy? According to the 2007 Census of Agriculture, data compiled by the United States Department of Agriculture Economic Research Service, the market value of agricultural products produced in the U.S. in 2007 was more the \$297 billion (USDA, 2007). U.S. farmers in 2007 had a net cash income of more than \$75 billion on the 2.204 million farms located across the country. Farm and farm-related employment accounted for more than 23 million jobs representing nearly 14 % of the total U.S. job market (USDA, 2002).

Because of its fertile soils and temperate climate, Louisiana has a vibrant agricultural industry. It was a key contributor to the state's economy in 2009 with food and fiber industries contributing nearly \$26 billion (Isuagcenter.com, 2011). The total on-farm value of commodities, the amount paid directly to the producers of agricultural commodities, for 2010 approached nearly \$5.5 billion (Louisiana Cooperative Extension Service, 2011). Value-added industries—industries that refine raw agricultural products—generated another \$4.4 billion for the Louisiana economy in 2010 (Louisiana Cooperative Extension Service, 2011).

In 2009, the agricultural industry provided approximately 238,000 people with full or part-time jobs in Louisiana. These individuals earned more than \$5 billion which represented 5% of the total compensation earned by Louisiana employees. (Isuagcenter.com, 2011).

One of the largest sectors of agriculture in Louisiana involves the production of agronomic crops. The production of agronomic crops is the foundation for many of the agricultural enterprises in the state (Louisiana Cooperative Extension Service, 2009). Agronomic crops not only produce food and fiber for people, but much of the state's livestock is dependent upon agronomic crop production. The state's nearly one billion dollar poultry industry relies on agronomic crop production to produce feed for its flocks. Other animal enterprises such as beef and dairy cattle are similarly dependent upon agronomic crops for feed production.

Agronomic crops in Louisiana are traditionally referred to as "row crops." Most of these crops are grown in straight rows that may or may not be elevated. Examples of these types of crops include corn, cotton, milo, oats, soybeans, sugarcane, sweet potatoes and wheat. While rice is not grown in rows, especially in south Louisiana, it is considered



to be an agronomic crop by those in the Louisiana agricultural community as stated by Dr. Johnny Saichuk, extension state rice specialist for the LSU AgCenter (personal communication, March 2, 2010).

Agronomic crop production plays a vital role in the economy in Louisiana. Many of the rural economies in the state depend upon agriculture. In 2010, the gross farm value of agronomic crop production in Louisiana was \$1.93 billion. When value-added processing is included, the amount grows to \$2.59 billion (Louisiana Cooperative Extension Service, 2011). These figures represent crop value alone, and do not reflect the contributions made to local economies through the purchase of related goods and services such as fuel, machinery and local labor needed to produce agronomic crops. It is clear that agronomic crop production is a significant industry for Louisiana.

### **Sources of Information Related to Agriculture**

An important source of agricultural information is the land-grant college or university. Many of these institutions have communication/information departments that are responsible for disseminating the latest research or news related to agronomic practices (Booth, Telg, Smith, & Tomlinson, 1992). These departments distribute information through a variety of methods including press news releases, print publications, video news releases (VNRs) and radio programs. This information can be acquired by producers through local newspaper articles, watching local news broadcasts, listening to local radio programming or by visiting the land-grant college or university's website.

In order to be recognized as a land-grant institution, the institution must be designated by its state legislature or by the United States Congress to receive the benefits of the Morrill Acts of 1862 and 1890 (SeEVERS, Graham, Gamon, & Conklin, 1997). The

establishment of these institutions during and after the Civil War played an integral role in the development of information pertaining to the cultivation of crops and the production of animals for human use. The institutions also provided the working class an opportunity for higher education with an emphasis on agriculture, military tactics, mechanical arts and classical studies. Currently there are 109 land-grant institutions located throughout the United States and its territories (Association of Public and Land Grant Institutions, 2010).

With a variety of information delivery methods available and a variety of sources including land-grant colleges and universities, a question to consider is what methods or channels do agricultural producers prefer to receive their information and what sources do they consider to be most important in regard to decision making in their operation. Because their occupation does not follow a traditional work schedule, does the convenience of the Internet offer a distinct advantage? Because producers spend many hours operating farm equipment inside the confines of a vehicle cab, is radio an effective means to communicate the latest research information? Are farmers avid subscribers to agricultural-related publications for the purpose of gaining the latest information regarding their profession? Do agricultural producers rely on their peers such as other producers or crop consultants for information more than other sources? Finally, are agricultural producers subscribing to electronic news services offered by land-grant institutions to receive information related to their specific agricultural endeavors?

### **Problem Statement**

While there is some previous research conducted on the information preferences of agricultural producers such as that by Risenberg and Obel Gor (1989), Suvedi, Campo and Lapinski (1999) and Tucker and Napier (2002), this researcher has been unable to

locate studies targeting agronomic crop producers in the southeastern United States. Without any explicit knowledge or direction, communicators and other employees within the LSU AgCenter are unable to specifically focus on the preferred methods of acquiring information by agricultural producers in Louisiana. A study of Louisiana-based producers and their preferred information sources can provide the LSU AgCenter with pertinent information that can help the AgCenter and perhaps other land-grant colleges and universities better serve the needs of their clientele. A concerted effort could be undertaken by AgCenter personnel, and the organization would operate more efficiently through the timely delivery of research information to producers throughout the state.

### **Purpose of the Study**

The primary purpose of this study was to determine the preferences of Louisiana agronomic crop producers and crop consultants in regard to acquiring information related to their agricultural operations. A secondary purpose was to determine how agronomic crop producers perceive selected LSU AgCenter information sources on accuracy, awareness and usefulness.

### **Objectives**

The following objectives were formulated by the researcher to guide this study:

1. To describe Louisiana agronomic crop producers on the following demographic characteristics:
  - a. Age;
  - b. Gender;
  - c. Race;
  - d. Agronomic crops produced and acres of each crop;
  - e. Percentage of income derived from agronomic crop production;
  - f. Size of farm in acres;
  - g. Years of farming agronomic crops;
  - h. Education.

2. To determine the perceived usefulness of selected information sources when making decisions regarding operations related to their farm among agronomic crop producers in Louisiana.
3. To determine the frequency of use of selected information sources among agronomic crop producers in Louisiana with regard to information that is used in the production of agronomic crops.
4. To determine the preferences for use of selected information sources among agronomic crop producers with regard to information used in the production of agronomic crops related to specific components of agronomic crop production.
5. To determine if a relationship exists between the perceived preferences for use of selected information sources of information as reported in objective four with regard to information used in the production of agronomic crops and the following selected demographic characteristics: age, number of crops farmed, education and acres farmed.
6. To determine the extent to which agronomic crop producers and crop consultants are aware of the information sources of the LSU AgCenter.
7. To determine the frequency of use of crop production information distributed by the LSU AgCenter among agronomic crop producers and crop consultants in Louisiana as related to specific components of agronomic crop production.
8. To determine the accuracy of information sources provided by the LSU AgCenter as perceived by agronomic crop producers and crop consultants in Louisiana.
9. To determine the preferences for use of selected information sources among crop consultants with regard to information used in the production of agronomic crops.

10. To determine if a model exists explaining a significant portion of the variance in LSU AgCenter information usage among agronomic crop producers in Louisiana from the following measurements:

- a. Perceived awareness
- b. Perceived accuracy
- c. Age
- d. Size of farm
- e. Number of agronomic crops produced

### **Definition of Terms**

**Agronomic crop producer**-an individual farming more than 200 acres of any of the following row crops: corn, cotton, milo (grain sorghum), oats, rice, soybeans, sugarcane, sweet potatoes and wheat.

**Information-delivery system**-a method that an agronomic crop producer utilizes in order to acquire information. Common delivery methods include the Internet, newspapers, publications, radio, television, fact sheets, etc. An information-delivery system will be considered as those systems that do not involve interpersonal communication such as personal discussions with other agronomic crop producers, agricultural sales representatives or crop consultants.

**Crop consultant**-an individual who provides recommendations and counsels agronomic crop producers in the process of agricultural production. These individuals are certified by the Louisiana Department of Agriculture and Forestry and are paid a fee by the producer.

### **Significance of the Study**

This study has enabled the researcher to determine the preferred methods for the delivery of crop information to agronomic crop producers and crop consultants in

Louisiana. It has also clarified what information sources are most important to agronomic crop producers and crop consultants in Louisiana.

Information gained in this study may be applied to other agricultural enterprises such as forestry, animal enterprises such as beef or poultry production, vegetable crops or the nursery industry. Since an agriculture component is present in every state, information gathered or trends identified in this study could provide guidance in communicating effectively with this audience across the country.

Land-grant institutions are actively involved in communicating with this group and could benefit from the findings of this study. Communication professionals at these institutions would not be the only group to gain from the study. Researchers and extension personnel who are charged with creating and circulating information concerning agriculture could use the findings to better develop effective programs and presentations that would reach a wider audience. By developing more effective communication techniques, scientists and extension personnel would be more productive and effective employees. This productivity may not only be gauged in dollars but also be measured by the time that is saved which can be devoted to other tasks.

The findings of this study have the potential to serve as a template for other land-grant colleges and universities communications departments to do further research of their clientele. This research could possibly determine if there are geographic differences or the type of agricultural enterprise has an influence on information preferences.

Extension agents who are responsible for developing educational programs may discern from this study the methods that are most effective in reaching their clientele. For example, if the research determines that agronomic crop producers prefer print material

mailed directly to them, it may be a pointless task for an extension agent to develop an educational video.

From a communication theory perspective, this study indicated that interpersonal communication is still a primary source for communication with individuals engaged in agriculture much like it was in early studies such as the hybrid corn seed study by Ryan and Gross (1943) or in later studies such as the precision agriculture study by Daberkow & McBride (2003). In both studies, mass media sources played a role in making individuals aware of the new agricultural innovation, but it was interpersonal communication that played a more significant role in the adaptation of the new technology.

In early diffusion research, Rogers (1963) stated that interpersonal communication was an important element. This interpersonal communication involved opinion leaders and change agents. These change agents played a crucial role in getting farmers to adapt to hybrid corn seed in the Ryan and Gross (1943) study. The researcher's study could be used to identify current change agents in agronomic crop production in Louisiana by determining who are the preferred information sources regarding specific components of agronomic crop production.

This study also provides evidence that discredits attacks upon other communication theories. Lowery (2004) argued through the media dependency theory that society has a greater reliance on mass media sources for information and less on interpersonal communication. The findings of this study indicate the mass media is not a primary source for this audience and refute these claims to some degree.

From an organizational perspective, information collected in this study can help the LSU AgCenter develop programs and present research data and recommendations in

the area of crop production in a more efficient manner. The communications unit within the AgCenter can use the findings of this study to create campaigns with a more targeted approach that are more likely to reach its intended audience.

Crop consultants, who are extension clientele, are involved with agronomic crop producers in recommending the best strategies to produce the highest crop yields. Consultants may recommend crop varieties to plant, suggest a pest management program, or a herbicide application plan. Their services are usually provided based upon a fee. Since this study determined that consultants indeed rely upon AgCenter recommendations as their primary information source, producers may be able to receive the same information from the AgCenter without paying a fee for this service. This information could be acquired from the AgCenter by simply visiting its website or through interpersonal communication with an AgCenter representative.

With government entities under pressure to be more efficient because of budgetary constraints, this study can provide land-grant universities and colleges with information that can improve the transfer of knowledge to its audiences.



## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

Information intended for use by an agricultural-based audience is not a recent phenomenon in the United States (Tucker, Whaley, & Cano, 2003). Much effort has been dedicated to make sure individuals involved in agriculture receive the latest information to be more successful. Disseminating this information has been a primary function of extension personnel across the country for nearly a century with much of this effort being conducted through land-grant institutions (Seevers, Graham, Gamon, & Conklin, 1997).

While technological advances to agriculture methods and equipment are a frequent occurrence, technology has also shaped the manner in which communicators reach those involved in production agriculture. In the early 1800s, print media was the primary source (Tucker, Whaley, & Cano, 2003). Over the years, electronic techniques were developed. Radio and television provided additional methods by which producers could acquire information they needed.

The most recent innovation involves the World Wide Web which gives audience members a choice of when they view and what they choose to view. Agricultural media organizations have utilized the World Wide Web to reach their audiences. In examining two organizations, the Livestock Publication Council and members of the National Farm Broadcasters Association, Rhoades and Aue (2010) found that 95% of the respondents reported having a website to share information with their clientele.

The World Wide Web also has given audiences a choice of becoming interactive with the media. Through the process of “blogging,” readers can interact with the authors and/or other readers. Rhoades and Hall (2007) found there are a number of blogs dedicated toward agriculture and issues related to the farming life.

Land-grant institutions have used the Internet for the dissemination of agriculture news through “podcasting.” Texas A&M University has enjoyed success with podcasting as evident by its growth. Over a one-year period, usage measured by “hits” to the A&M-produced *AgNews Weekly* podcast grew from 10,152 in December 2004 to 28,813 in December 2005 (Fanin, 2006).

Communication research examining issues related to agriculture has made contributions to the scholarly field. The Ryan and Gross (1943) hybrid seed study laid the foundation for Rogers’ (1983) diffusion of innovations theory. The main premise of diffusion theory is how innovations are communicated through a society and how these innovations are adopted. Hall and Rhoades (2007) examined how the national media reported on stories related to corn-based ethanol. In the study, Hall and Rhoades sought to explain how objective the reports were primarily based on the number of attributed sentences. This study also investigated how the media framed issues related to ethanol production.

Because a wealth of information for agricultural-based audiences is being generated and various sources and methods are being used, researchers have had the opportunity to investigate various issues. Research has focused on what type of information is being sought (Hopkins & Morehart, 2001), audience characteristics that influence the sources and methods that are used (Batte, Schnitkey, & Jones, 1990) and what are the preferred sources and channels (Licht & Martin, 2006).

This study sought to determine the preferences of Louisiana agronomic crop producers and crop consultants in regard to acquiring information related to crop production. The researcher was unable to find any published research information related to this audience. Some research has been performed on other agricultural audiences. Licht

and Martin (2006) looked at the preferences of Iowa corn and soybean farmers. Suvedi, Campo, and Lapinski (1999) examined farmers in the state of Michigan and their efforts involved in acquiring information related to agriculture. These two studies are examples of the many studies undertaken with a focus on information sources related to gathering agricultural information.

In order to understand the wealth of information focusing on an agricultural-based audience, an examination of these efforts reveals that communicators have been involved in this effort for many years, and the ways they use to communicate have also evolved.

### **Communication Efforts in Agriculture**

#### **The Print Era**

An important component in American culture is communication. American society has been characterized as having an insatiable appetite for information. The first successful newspaper in North America was John Campbell's *Boston News-Letter* in 1704 (Sloan, 2005). This publication focused on alerting its readers to events that were occurring locally and happenings back in England and Europe.

Early publications were often published by individuals who were already involved in the printing business and possessed the necessary equipment to publish a newspaper. By 1833, more than 1,200 newspapers were being published in the United States (Mott, 1947).

Initial efforts in agricultural communications began approximately 200 years ago. The concept was spawned by a growing need to share important information concerning the cultivation of crops with isolated audiences. The early leaders in this field were not only excellent communicators, but they represented some of the leading agricultural producers of their era. The reputation of these leading producers lent a tremendous

amount of credibility to the information they disseminated (Tucker, Whaley, & Cano, 2003).

One of the earliest journals was begun by John Stuart Skinner in the early 1800s. Entitled the *American Farmer*, the goals of the journal according to Skinner were:

The great aim, and chief pride of the *American Farmer*, will be to collect information from every source, on every branch of husbandry, thus to enable the reader to study the various systems which experience has proved to be best, under given circumstances (Boone, Meisenbach, & Tucker, 2000, p. 7).

Early agricultural communication typically focused on practical knowledge that farmers could apply to their operations. There was little effort given to the scientific principles of farming. Many of these early journals were short-lived due to financial difficulties (Boone, Meisenbach, & Tucker, 2000).

Financial difficulties were not the only issues facing agricultural communications. Publications such as the Massachusetts Agricultural Society complained that there was a lack of material for publishing because farmers were not sharing their knowledge related to producing crops and field experiments (Marti, 1980). Editor John Lowell stated that “the unwillingness of our own citizens engaged in agriculture to furnish the results of their own experiments and discoveries” was hampering his publication (Marti, 1980). The society ceased publishing in 1832.

The popularity of agricultural-based publications grew due to technological advancements in the publishing world. Steam-driven cylinder presses replaced labor-intensive flatbed presses (Boone, Meisenbach, & Tucker, 2000).

The first newspaper to install a steam-driven press was the *Daily Advertiser* in New York (Mott, 1947). The new press system allowed up to 2,000 copies to be printed per hour helping papers meet increasing circulation needs.

The growth of publications was bolstered by increasing circulation. The American Agriculturist enjoyed one of the largest circulations, claiming one issue sold nearly 80,000 copies in the 1850s (Marti, 1980).

One of the most successful agricultural publications in the 19<sup>th</sup> century was *Colman's Rural World*. Originally called the *Valley Farmer*, the name was changed by publisher Norman Colman (Lemmer, 1949). This weekly paper was published from 1868 until 1916 when it was absorbed by the *Journal of Agriculture*.

A factor that contributed to the success of *Colman's Rural World* was the publisher's insistence that much of the information published should come from "practical farmers" (Lemmer, 1949). Colman was of the opinion that articles written by farmers would have the most appeal to other farmers and bring legitimacy to the publication.

Colman was a strong advocate and voice for agriculture, especially for the Mississippi River Valley area. He was instrumental in getting the Department of Agriculture to achieve cabinet status and was appointed the first secretary of agriculture by President Grover Cleveland in 1889 (Lemmer, 1949).

A key development that would lead to the creation of a significant amount of agricultural information was the Morrill Act of 1862. Originally introduced in 1857, the act became law in 1862 and laid the foundation for the establishment of the land-grant college and university system (Association of Public and Land-Grant Institutions, 2010). The act was passed during the Civil War because it had met resistance from representatives of the southern states prior to the war. Ironically, southern states would greatly benefit from stipulations presented in the Morrill Act.

The act provided a land grant to each state of 30,000 acres per congressman (Simon, 1963). The proceeds from the sale of these lands would be invested to supply an endowment for the founding of a college with the primary purpose of teaching agriculture, military tactics, mechanic arts (engineering) and classical studies (Simon, 1963).

The land-grant colleges and universities generated much information on the cultivation of crops as per the mandate of the Morrill Act. The passage of the Hatch Act in 1887 helped establish the agricultural experiment station concept. With support from Colman, these experiment stations were closely aligned with the area land-grant colleges and universities. The stations performed agricultural experiments on crops native to the area, and federal monies were allocated for publishing the results (Association of Public and Land Grant Institution, 2010). These results could be found in local newspapers, magazines, or bulletins published by the experiment stations.

During the 19<sup>th</sup> century farming publications experienced tremendous growth. From 1860 to 1880, farm newspapers grew from approximately 60 to more than 150 (Fry, 2004). By 1895, there would be more than 300 farm publications. By 1920, there would be 405 farm newspapers (Fry, 2005).

Readership numbers were also growing rapidly. Circulation for farm newspapers went from just over 1 million in 1880 to more than 5.5 million in 1895 (Fry, 2004). These newspapers were usually published on a weekly or monthly basis with subscription prices ranging from 50 cents to \$4 a year.

One of the most successful agricultural publications was started in February 1886 in Winston, North Carolina (Scruggs & Moseley, 1979). Today, *The Progressive Farmer*

remains one of the most recognized publications related to agriculture. The mission of the magazine was stated by its founder, Colonel Leonidas L. Polk:

A properly conducted weekly journal devoted to agricultural and other industrial interests of our people is a public necessity. Encouraged by the opportunity presented and by the gratifying indications of generous support in the undertaking from all sections of our state, I assume the task and will devote to this, my chosen lifework, all of the energy and fidelity of which I am capable. (Scruggs & Moseley, 1979, p. 24).

Other notable agricultural publications from this time period included the *Southern Agriculturalist* (1869-1958), *Farm and Ranch* (1883-1960), *Southern Ruralist* (1893-1930) and *The Southern Farmer Gazette* (1895) which later merged with *Progressive Farmer* in the early 1900s (Scruggs & Moseley, 1979).

In four years, *The Progressive Farmer* had become one of the most successful agricultural publications. In 1890, the circulation rate had grown to nearly 12,000 subscribers, making it the largest newspaper in North Carolina (Scruggs & Moseley, 1979).

Articles from agricultural publications of this era typically had one of three themes (Scruggs & Moseley, 1979). The first theme focused on an editorial piece written by the editor on a topic of central interest to all of its readers or a controversial issue.

A second theme frequently presented in publications focused on news of world or national affairs. Many times these articles were reprints from other journals or publications (Scruggs & Moseley, 1979).

The third type of article featured letters from other farmers on how they dealt with production problems on their farms or farmers presenting problems and asking for advice as to how to overcome these problems (Scruggs & Moseley, 1979).

The content of agricultural newspapers of the late 19<sup>th</sup> and early 20<sup>th</sup> centuries was similar although the amount of space devoted to specific topics varied based upon the region of the country in which the publication was located (Farrell, 1977). Regardless of the region, advertising was a prominent feature in agricultural newspapers. According to Farrell (1977), advertising consumed 22.5% of space in agricultural newspapers between 1860 and 1870. This number would reach 36.7% during the time period of 1900-1910.

Advertising had a dual purpose during the time period of 1860-1910. Advertising served as a source of revenue for the paper which was important for the survival of the publication. Secondly, advertising was a way to introduce farmers to new products that could help them become more productive in their profession (Farrell, 1977).

Government action in the early 20<sup>th</sup> century led to an explosion of agricultural information. In 1914, Congress passed the Smith-Lever Act. This act established the Cooperative Extension Service. One of the extension service's main charges was the dissemination of scientific information to the general public on issues primarily dealing with agriculture, home economics, and rural energy ([www.higher-ed.org/resources/smith.htm](http://www.higher-ed.org/resources/smith.htm), 2010).

The Cooperative Extension Service became a partnership involving federal, state, and local governments serving the needs of the local citizenry through the establishment of a branch office in the parish (county) seat. Through their association with the land-grant college and university system, local extension offices became a clearinghouse for information generated by agricultural experiment stations or university-based research. Much of this information was shared through research publications, bulletins or by articles in local newspapers.



The Cooperative Extension Service placed a premium on communicating effectively with its clientele. To help accomplish this task, trained journalists were hired to prepare news releases and other technical bulletins (Scruggs & Moseley, 1979).

The period between 1920 and 1940 was relatively stable for the agriculture publishing industry (Boone, Meisenbach, & Tucker, 2000). It was the economy that suffered greatly because of a global recession. The Great Depression took its toll on the farming sector.

Total circulation during this time period grew from 17 million in 1920 to 22 million in 1940 despite the loss of some farming publications (Boone, Meisenbach, & Tucker, 2000). Farming publications not only faced dire economic conditions during this era, but competition from a new form of medium—radio.

Agricultural publications enjoyed even greater success in the years between 1940 and 1980 (Boone, Meisenbach, & Tucker, 2000). The number of farm magazines increased which bucked the trend of the publication sector during this time period. Circulation also continued to rise as farm income increased from efforts related to world conflicts in which the United States participated (World War II, Korean War, Vietnam War). The average farm subscribed to seven agricultural publications in 1970 (Boone, Meisenbach & Tucker, 2000).

One phenomenon that was occurring in agriculture during the time period between 1940 and 1980 was the growth in the size of farms. While the number of farms was dwindling, those farms remaining in business were growing in terms of size and income.

In 1960, high income farms (those with sales exceeding \$100,000) consisted of less than 1% of all farms. By 1975, there were nearly five times as many high income farms representing 3.9% of all farms (Brunn & Raitz, 1978).

In 1960, high income farms generated nearly 17% of all farm revenue. By 1975, 47% of all farm revenues were being generated on less than 4% of the total farms (Brunn & Raitz, 1978).

While farming publications came through the Great Depression in the 1930s virtually unscathed, they were not so fortunate in the 1980s. During this decade, the farm economy experienced one of its worst periods (Tucker, Whaley, & Cano, 2003).

The plight of the American farmer caught the attention of many Americans as farms across the country went out of business. The inaugural Farm Aid concert was started by Willie Nelson, Neil Young and John Mellencamp in 1985 to aid farmers in dire economic conditions ([www.farmaid.org](http://www.farmaid.org), 2010).

Farm publications suffered both from the loss of their audience and from dwindling advertising revenues. Some did not survive this crisis; others were bought out by larger media conglomerates and operated under new management (Tucker, Whaley, & Cano, 2003).

Farm publications in the 1990s began to follow the trend of the farming population. In this decade, less than 2% of the population was farm-based (Boone, Meisenbach, & Tucker, 2000). With a declining audience, farm publications suffered. Coverage of agricultural related issues in local newspapers decreased because of limited audience appeal.

## **The Electronic Era**

### **Radio**

The second century of agricultural communications can be characterized by the introduction of electronic media. The first electronic medium to emerge was radio in the 1920s. Radio was used by agricultural producers for very basic information. Farmers typically relied on the radio for weather reports that would aid in planning tasks related to their occupation or to protect their property such as livestock (Wik, 1981). These weather forecasts were typically provided by a local radio station or a local military broadcast.

Henry C. Wallace, secretary of agriculture from 1921-24, recognized the importance of radio in delivering crucial weather information to farmers. He asserted that millions of dollars could be saved by warning farmers of impending floods or other hazardous weather conditions. By 1923, 27 naval stations and 117 general broadcast stations were providing weather reports that encompassed the entire nation (Wik, 1981).

Market information was the next type of report to be featured prominently in radio broadcasts. Before the beginning of radio in the United States, the United States Department of Agriculture (USDA) realized the importance of getting the most current information related to market prices in the hands of farmers. In 1913, the USDA established the Federal Bureau of Markets whose charge was to collect information concerning market prices and crop conditions throughout the country. Seventy-five observation posts were linked by 4,500 miles of telegraph wire that led back to Washington, D.C. (Wik, 1988).

With the advent of radio, the relaying of market prices became more effective and timely. In 1922, 35 stations had received federal licenses to broadcast market reports. In 1925, more than 500,000 farmers could receive these reports, and by 1926, 500 radio

stations were reaching more than 1 million farm families (Boone, Meisenbach, & Tucker, 2000).

Radio quickly became an important tool for the farmer, and the USDA was aware of the ramifications of radio. In the 1920s, 75% of farmers in Iowa reported receiving their market news from the Ames station WOI. Because of the reliance of Iowa farmers on WOI, the USDA granted an appropriation for the leasing of a line directly from Washington to Ames to present the latest market information (Wik, 1988).

KDKA in Pittsburgh is widely recognized as being the first commercial radio station and recipient of the first commercial license in 1920. Also in the 1920s, Secretary of Commerce Hebert Hoover used his authority to grant Westinghouse a permit to broadcast. The station's first broadcast focused on the Harding-Cox presidential race (Foust, 2000).

The management of the station was aware of the large audience of farmers and hired Frank E. Mullen to serve as the nation's first full-time farm broadcaster (Baker, 1981). Like most agricultural programming of this era, Mullen devoted much of his on-air time to market conditions. He also began using sources from the land-grant system by including county agents and extension specialists as guests on his program.

The growth of radio during the 1920s was extraordinary. In 1920, there were three broadcasting radio stations (Wik, 1988). By 1923, there were more than 600. By 1928, nearly one-third of all homes had an operating radio with a potential audience of 41 million. President Warren Harding spoke to a radio audience of 125,000 people in his 1921 inaugural address. Four years later, President Calvin Coolidge would have an audience of close to 25 million (Wik, 1981).

While radio was experiencing phenomenal growth, farm families lagged behind the general populace when it came to adopting radio. In 1925, 10% of all households had radios but only 4.5% of farm homes owned a receiver. By 1930, 40% of all households possessed a radio while only 20.8% of farms owned one (Sterling & Kittross, 1990).

Land-grant colleges and universities played a role in the growth of radio. In 1925 a survey by the Association of Agricultural College Editors (AACE) found that 24 land-grant colleges and universities had radio stations (Baker, 1981).

In the early stages of radio, farm publications did not view radio as a direct threat to a publication's profitability, but as only a competitor for audience time (Evans & Salcedo, 1974). In fact, many publications were writing about the effect radio was having or could potentially have on rural individuals, especially those engaged in agricultural enterprises. The Agriculture Index showed more than 110 articles focusing on the role of radio in the years between 1922 and 1924 (Evans & Salcedo, 1974).

The USDA played an important role in the infancy of radio farm programming. Its first foray into national information programming involved *The United States Radio Farm School*. The content of this program focused on technical methods that could improve productivity. Listeners were encouraged to "enroll" in the course, and by sending one's address, lesson plans related to the content of the program or "classes" were sent. Farmers used this information to help increase their production (Craig, 2001).

Commercial entities also got involved in radio programming. Seeing the potential to promote products it sold, the Chicago-based Sears, Roebuck and Company created WLS (the initials came from "World's Largest Store") in 1924. Within a year, the station upgraded its transmitter to 5,000 watts and was being heard in several neighboring states (Craig, 2001).

WLS had a variety of agricultural-based programming. The station sponsored a daily farm program called the *R.F.D. Club* that proclaimed to have 15,000 members in 40 states (Craig, 2001). It also featured market reports and music it claimed would appeal to a rural audience.

One of the most popular radio programs in the 1920s was the *National Farm and Home Hour*. Broadcast on 13 National Broadcasting Corporation (NBC) stations starting in 1928, the program featured Frank Mullen and information from the USDA (Baker, 1981). The show aired six days a week covering important agricultural issues and events. The second Saturday of the month was devoted to 4-H, the nation's largest youth organization that was centered on agricultural concepts.

The *National Farm and Home Hour* had a very successful run. The daily series aired for nearly 16 years, ending in June 1944. During this period, more than 4,600 programs were presented (Baker, 1981). The program aired as a weekend-only program for a short time and was cancelled at the end of 1944.

During the Great Depression years beginning in the late 1920s, competition for audiences and advertising revenues did play a factor in the economic viability for some radio stations and agricultural publications. Radio's popularity and its newness gave it an advantage over farm publications and helped it survive during these tough economic times.

Between 1930 and the 1950s much of the content of radio was created by the USDA. The USDA not only supplied the material but also personnel to produce the content. Most of the information was used by farmers during this period focused on increasing their productivity (Baker, 1981).

Farm groups and organizations played a major role in the debate over high-power clear channel radio stations. These radio stations broadcast at strengths upwards of 500,000 watts and could be heard over great distances (Foust, 2000).

To broadcast at these high wattages, a special license was required from the federal government. The federal agency responsible for granting such licenses was the Federal Radio Commission (FRC). Owners of clear channel stations worked to form alliances with such groups as the American Farm Bureau Federation (AFBF) and the National Farmers Union (NFU). The owners argued that the best way to serve a rural audience was through the transmissions of clear channel stations that had the capability to reach large audiences across large geographical areas (Foust, 2000).

This argument did have merit in the early days of radio. Programming through the 1930s and 1940s had a strong agricultural presence. This position was not as valid in the 1960s as radio programming was being dominated by content aimed at more metropolitan and suburban audiences. This change in programming was brought about by a shrinking farming population and was a sound decision based on the changing demographics of the period (Foust, 2000).

Clear channel lobbying was more successful with AFBF than with the NFU. AFBF's director of information, John Lacey, testified at a government hearing supporting clear channel broadcasters and opposing legislation to limit clear channel broadcasts. He phrased it as "the have-nots trying to take from the haves" (Foust, 2000).

The NFU was critical of clear channel radio stations. They argued that the stations were more interested in profiting and not for the greater good of groups such as the farming community. The NFU stated the clear channels were being given a monopoly,

and local stations would suffer leading to less local programming for the citizenry (Foust, 2000).

In 1950, the number of radio stations throughout the United States declined for the very first time. A total of 209 radio stations went silent in a one-year period (1950). During this same year, TV audiences grew from 8 million to 28 million people (Baker, 1981).

After 1950, fewer national agricultural radio programs existed. While there was some national programming, many stations were beginning to involve local people to discuss area agricultural issues. Time devoted to agricultural topics began to decline during this time, and today, there is less time devoted to agricultural issues along with less programming devoted to this topic.

### **Television**

The next major innovation to take place in the electronic era was television. Crude devices that were more scanning mechanisms than television sets were created as early as 1911 (Winston, 2003). It was not until nearly 20 years later that gadgets that served as the forerunners of modern television sets began to appear.

Television did not have the same rapid growth as radio. Much of that could be related to the cost of a television set as compared to a radio receiver. The outbreak of World War II became the focus of industry and citizens with much of their efforts focusing on the production of products to aid the war effort.

The Federal Communication Commission (FCC), the name of the agency now charged with regulating radio and television, was also responsible for slowing the progress of early television. The FCC virtually refused to issue any new broadcast



licenses for television stations for four years beginning in 1948. This era became known as the “Freeze” (Gomery, 1997).

In 1948, there were four networks, 52 television stations and less than a million television sets. By 1960, there were 650 VHF stations with an audience of more than 36 million homes. Ten years later, there would be nearly 90 million televisions in the United States (Winston, 2003). Television could be found in more than 95% of the households.

The number of television stations continues to grow. In a speech delivered to the Newspaper Association of America’s annual conference on April 4, 2006, then FCC Chairman Kevin J. Martin reported that more than 1750 stations were broadcasting. According to Martin (2006), the number of radio and television stations broadcasting had nearly doubled in the years between 1975 and 2005.

The role television would play in agriculture in television’s early days was unclear. Radio had a clear vision when it began broadcasting in relation to the demands of farmers. This vision was to bring reports related to market conditions and the weather. With this information readily available through radio, the role of television involving agriculture was ambiguous.

In television’s infancy, extension agents expected television to become an integral part of how agents would present their programs to the audiences (Brunner & Yang, 1949). Brunner and Yang predicted that extension demonstrations and 4-H field days would garner television viewers.

Early agricultural programs were typically films focusing on techniques that would help advance farming practices and increase productivity. These films were often marketed to local stations with the hope of generating revenue through the sale of advertising (Baker, 1981).

One of the earliest ventures in television focusing on agriculture was a weekly program entitled *Farm Newsreel*. The program was sponsored by American Cyanamid, a petro-chemical organization that manufactured agricultural products such as pesticides. The program started production in 1958, and air time was purchased on 52 stations across the country (Baker, 1981).

One year earlier, Michigan State University began to produce television programs targeting young people. These programs were aimed at students 9 to 11-year-olds (Van Horn, Flanagan, & Thomson, 1999). The students were at an age that made them eligible to join 4-H, the youth organization run by the state's extension service.

Like it had been with radio, the USDA got involved with the production of agricultural-related television shows. Under the direction of Lane Beatty, chief of the USDA's Radio and Television Service, *Across the Fence* was created (Boone, Meisenbach, & Tucker, 2000). The program followed the format of the *Farm and Home Hour* radio program with much of the content focusing on agricultural issues featuring USDA personnel. The program began in 1961 and by the end of the decade could be seen on approximately 120 stations. When the program was discontinued in the 1970s, it was shown on less than 100 stations (Baker, 1981).

A second USDA program called *Down to Earth* was a 4 ½ -minute program designed to be incorporated into a local news broadcast. These segments were designed to help supplement the nearly 115 hours of programming dedicated nationally to farm news (Baker, 1981.)

In 1963, there were more than 650 television stations operating in the United States with more than 500 producing an agricultural-based program (Baker, 1981).

Approximately 100 stations employed a professional farm broadcaster to develop or host agricultural-related programming.

About the time *Down to Earth* and *Across the Fence* were ending their production runs, WGN-TV in Chicago launched a farming-focused program called *U.S. Farm Report*. Beginning in 1975, the program was initially carried by 60 stations primarily in the Midwest (Baker, 1981). According to Luane Graber, distribution account executive for the producers of *U.S. Farm Report*, the program is seen on 188 stations covering 162 markets with an average viewer penetration of some 600,000 households. This number does not include viewers on satellite television (L. Graber, personal communication February 9, 2010).

Another popular daily agricultural program is *AgDay*. The program began airing in 1981 and is produced in South Bend, Indiana. It boasts a national audience but lacks the audience of *U.S. Farm Report*. *Ag Day* is broadcast in 39 states on 131 stations representing 120 markets. Its average viewer penetration is approximately 200,000 households which does not include viewers on satellite (L. Graber, personal communication February 9, 2010).

While agricultural-based programming has had a long history of television usage, the impact of television has not been as influential as radio and the print media. Television has become a popular medium for the general public to receive news, but farm programs have not enjoyed the same success (Boone, Meisenbach, & Tucker, 2000).

### **Information Delivery Systems**

Another electronic delivery system utilized to acquire agricultural material is an information delivery service. One of the most popular systems is the DTN/FarmDayta service (Boone, Meisenbach & Tucker, 2000). Started in 1984 and based in Omaha,

Nebraska, customers subscribe to the service. The information is delivered by an FM signal to a receiver and displayed on a computer monitor. The subscriber scrolls through a menu and selects the desired information. Market information and weather conditions are two of the more popular topics among users of this system.

In 1998, DTN/FarmDayta had more than 159,000 subscribers in the United States and Canada (Boone, Meisenbach, & Tucker, 2000). In 2009, this number had decreased to 120,000 subscribers ([www.dtn.com](http://www.dtn.com), 2009).

### **Computer Usage and the Internet**

The next method used for the delivery of agricultural information was the Internet. Before discussing the Internet, the adoption of the computer into the home of the agricultural producer should be discussed because without the adoption of the computer, the ability to access the Internet is highly unlikely. Also, themes that applied toward the adoption of computers by agricultural producers are similar in relation to Internet usage by agricultural producers.

The adoption of computers by farmers was extremely slow in the 1980s. Abbott and Yarbrough (1992) found that by 1989 approximately 15% of working farms had a computer. During the 1980s, the adoption rate of computers increased between 1 and 2% per year. Abbott and Yarborough (1992) estimated that at its current adoption level, computers would be found on nearly 35% of all farms by the year 2000.

Farm sales played a significant role in the adoption of the computer. Farms that had sales of more than \$100,000 adopted computers at a higher level in New York and Iowa (Abbott & Yarborough, 1992). Farmers who were more educated also were more likely to utilize a computer than those with less education.

Farming populations seemed to mimic the non-farming population when comparing the adoption of computers in the state of New York. The adoption of computers in non-farming and farming households with incomes greater than \$40,000 was higher than those with lower incomes (Abbott & Yarborough, 1992). The gap between the “haves” and the “have nots” with regards to computer adoption was widening among both the farming population and the non-farming population at a similar rate in New York.

Amponash (1995) found similar results when he examined computer adoption in North Carolina farming households. Amponash found that the computer adoption rate in North Carolina was 14.4% in 1991. This rate was similar when compared with the findings of Abbott and Yarborough (1992). He also found that larger farms (500 or more acres) were more likely to adopt computers.

Education also was a factor in North Carolina. As education increased, the adoption of computers increased along with the perceived usefulness of the computer (Amponash, 1995).

Computer adoption in agricultural operations seemed to gain momentum soon after the research of Abbott and Yarborough (1992) and Amponash (1995). A survey of 10 Great Plains states indicated that approximately 37% of producers had incorporated computers into their operations by 1995 (Hoag, Ascough II, & Fraiser, 1999). This number was slightly higher than the rate forecast by Abbott and Yarborough (1992) for the year 2000. Perhaps just as significant was that the adoption of computers by agricultural producers now equaled the adoption of computers by the general population, a phenomenon not expected based on the findings of Abbott and Yarborough (1992) and Amponash (1995).

Much like previous studies, the size of the farming operation is positively related to the adoption of computers according to Hoag, Ascough II, and Fraiser (1999). They found that for every increase of 1,000 acres of farming operations, the likelihood of computer adoption increased by 3%. Larger farms (sales greater than \$100,000) also had greater computer adoption than smaller farms. Whether geography played a factor in the findings of this study was undeterminable.

In 1991, computer adoption in Ohio was 32% (Batte, 2005). This number was much higher than the 15% found by Abbott and Yarborough (1992) and the 14.4% found by Amponash (1995). By 2003, the number in Ohio had risen to 44% (Batte, 2005).

Batte (2005) found similar findings from previous research regarding computer adoption. Farm size, sales, and education level contributed to the adoption of computers. Larger farms, increased sales and higher education levels led to increased adoption of computers.

With the increasing adoption of computers among both the general population and agricultural producers, access to the Internet improved. The swiftness with which Americans adopted the Internet is dramatic in comparison to radio and television.

The evolution of the Internet has been broken into three segments by some researchers. The first phase, the years between 1960 and 1985, focused on work done by computer scientists and engineers in developing the hardware that would be the foundation for the Internet (Mowery & Simcoe, 2002).

One of the most important occurrences during the first stage of development involved the creation of domain names. Previously, computers were identified through numbers that were used to designate their Internet protocol addresses (Griffiths, 2002). With the establishment of domain systems, Internet addresses were organized by their

affiliation. Commercial entities were organized using a “.com” address, government sites by the “.gov” address, educational institutions by “.edu,” and international organizations or nonprofits by a “.org” address (Griffiths, 2002). The structuring of address via their domain names led to a more structure and organized Internet.

The second phase of the Internet focused on developments between 1985 and 1995. It is during this time period that private entities became engaged in the management and structure of the Internet (Mowery & Simcoe, 2002).

The third phase of the Internet was the era after 1995. Private companies began to introduce software technologies, and the Internet became more consumer-oriented. Stock offerings of Netscape characterized the beginning of this era (Mowery & Simcoe, 2002). It was the beginning of the “dot com” era of growth.

Because farming operations generally take place far away from urban areas, some believed that a “digital divide” between urban and rural areas would contribute to a difference in the adoption of information technology such as the Internet. Hindman (2000) found that while there were some discrepancies between the amounts of usage of information technologies between rural and metropolitan areas, place of residence was not the biggest constraint. Stronger indicators were income, age and education. The affordability of personal computers and the increasing adoption in rural homes were helping to reduce any digital divide between rural and urban areas.

When compared by occupation, agriculture has lagged behind most occupations regarding Internet usage. Hipple and Kosanovich (2003) found that nearly 66% of the individuals engaged in jobs in the finance, insurance, and real estate sector reported using the Internet. The study found that agriculture had the lowest Internet usage at 12.2%. A possible factor that may have skewed this number according to the authors was that the

agriculture group included those engaged not only in farming but also forestry and aquaculture.

While individuals engaged in agriculture have been somewhat slower to embrace the Internet, some organizations involved in agriculture appear to be somewhat slow in using this technology. Rhoades and Aue (2010) conclude in their study that a number of agricultural organizations are late adopters to the Internet. These organizations also believe that their audiences prefer to receive information by magazines and radio which may be a factor related to the organizations adopting an Internet component.

It does not take long though for an information explosion to take place as evidenced by the rapid growth of the Internet. In 1995, only 5 million Americans had Internet access. In four years, this number had grown to 50 million (Stempell III, Hargrove, & Brent, 2000).

Individuals involved in agriculture contributed to these numbers. Between 1997 and 2000, Internet usage among farmers grew from 13% to 43% (Hopkins & Morehart, 2001). Eighty-two percent of the farmers who used the Internet as reported by the USDA Resource Management Survey were for the tracking of commodity futures prices. The second most common reason was for contacting agricultural information services (Hopkins & Morehart, 2001).

In 2007, computer ownership and Internet usage continued to rise. According to the National Agricultural Statistics Service (NASS) of the USDA (2007), 57% of the farms with sales and government payments between \$10,000 and \$99,999 owned or leased a computer. Internet usage was 53% for this group.



For farms with sales and government payments exceeding \$250,000, computer usage and Internet access increased. Farms of this size reported owning or leasing a computer at 78% and Internet usage at 75% (NASS, 2007).

Economics has been a significant factor in the growth of the Internet for agricultural producers. In 2001, farms within the United States with sales exceeding \$100,000 were more likely to have access to the Internet. Fifty-nine percent of these farms were able to connect to the Internet as compared to 39 % of the farms with sales below \$100,000 (Gabriele, 2004).

Similar findings by Park and Mishra (2003) supported the argument that farm size is an important factor related to Internet usage. Their study indicated that the educational level of the farmer, the diversification of crops produced, and the location of the farms also played a role in Internet usage.

According to Park and Mishra (2003), producers with more education were more likely to use the Internet. The researchers argued that more educated farmers were more likely to understand the relationship between agricultural production and financial arrangements, and thus would require additional information. This demand for information would lead to more time spent on the Internet and with other sources searching for information. Results indicated that for each additional year of education the number of Internet uses by farm operators increased by 2.6% (Park & Mishra, 2003).

Diversification also led producers to seek more information according to Park and Mishra (2003). If a farmer was engaged in several crop commodities, this individual was more likely to seek information because of the complexity of the operation as compared to a farm operation engaged in the production of only one commodity.

With increased Internet usage, the next question to examine is what exactly are farmers “searching” for on the Internet. Much of what they are looking for is access to farm information or computer-based management tools. According to Batte (2005), 73% of the farmers who reported Internet usage were performing information searches. Internet-based tasks such as tracking commodity prices, online banking or bill paying, buying farm inputs, and selling commodities were some of the most important computer-based tasks (Batte, 2005).

Batte (2005) determined that Internet usage was becoming a communication tool for producers. The Internet was being used by producers to share information regarding production techniques. The Internet also provided an avenue for producers to market their crop or purchase products.

Agricultural producers in the United States have been slower to use the Internet to engage in e-commerce (buying and selling of goods over the Internet) than those in Germany. In the United States, only 15% of U.S. farms used the Internet in 1999 for e-commerce while 78% of farms in northern Germany participated in e-commerce (Mueller, 2001).

The Internet was not a widely used tool in job searches related to occupations in farming, forestry, and fishing. Only 4.1% of individuals seeking a career in these fields reported using the Internet as a tool in searching for employment (Hipple & Kosanovich, 2003).

### **Information Channels and Preferences for Agricultural Producers**

Agricultural producers can turn to many sources for information. Receiving information can be as easy as subscribing to a farming publication, turning on a radio,

consulting with personnel of land-grant universities, or interpersonal communication with other farmers or suppliers of agricultural goods and services.

While land-grant universities are a large supplier of information, these universities must compete with other entities for the attention of agricultural producers. Media outlets such as newspapers, radio, and television provide growers with information by devoting space in their publications and radio and television news releases. Many of these outlets also maintain a World Wide Web presence that supplements their efforts. Farming periodicals such as *Delta Farm Press* and *Progressive Farmer* are publications dedicated to providing information on the latest trends and personalities in agriculture and engaged in both print and Web-based deliveries.

Interpersonal communication between producers is prevalent and evident by the many active commodity groups. Members of such organizations generally meet annually and keep attuned to the latest developments related to the commodity. In the state of Louisiana, two examples of such groups are the Louisiana Cotton Producers Association and the Louisiana Rice Growers Association. Other commodity groups have similar organizations.

Previous research has looked at the information channels used and preferred by agricultural producers. One factor that is apparent is that as communication channels increase, agricultural producers have more options at their disposal.

### **Print Publications**

An early study of sources of information for farmers was reported by Bredvold (1949). Bredvold sampled 577 farm operators across Iowa to determine what the most important sources of information were with regard to 23 different topics such as the handling and feeding of livestock, corn loans, and other federal farm programs, and

kitchen and home equipment. Farm papers and farm and non-farm magazines were the most popular source for 14 of the 23 topics. The worst ranking for farm papers and farm and non-farm magazines was third in two topics; advice on current livestock and grain markets and health and medicine.

Two of the sources least used for information was the extension worker and extension bulletins. The highest ranking of any category for the extension worker was a third place ranking regarding information toward contouring and terracing. For the other 22 categories, a seventh place ranking was the highest.

The best ranking for extension bulletins was a ranking of sixth under the topics of livestock and poultry diseases and child care. The rest of the rankings were in the range between 6.5 and 11 with 11 being the lowest ranking achievable.

From the findings of Bredvold (1949), Iowa farmers did not rely on the land-grant university system for information. His findings indicated that focused and general mass media efforts such as farm papers and farm and non-farm magazines were the sources of information most used by Iowa farmers. This finding was further supported by the study in that radio ranked as a high information source and was relied upon much more than extension workers and bulletins.

In some instances, the topic on which information is being sought can influence the preferred method of receiving information. A study in Iowa found that more than 60% of Iowa farmers used farm newspapers/publications, radio and television to obtain environmental information related to groundwater quality (Padgitt, 1987) However, television and radio were considered to be the least reliable sources.

At times, agricultural producers may need detailed information regarding specific components of their operation. Information related to new cultivation techniques may be

sought to help determine whether fuel costs could be reduced based upon the reduction of equipment use in the preparation of seed beds. The release of a new insecticide may cause a producer to seek information to help determine whether this new insecticide will provide the producer with a positive benefit. This benefit could be a more effective pest management system leading to higher yields for the producer.

In California, a convenience sample of agricultural operators who were recipients of safety awards by the state and the California Farm Bureau were asked what sources were used for information regarding safety (Grieshop, 1999). This group consisted of 662 individuals and represented approximately 5% of the 13,000 eligible farmers.

The respondents were asked to select from 12 possible sources of information. These sources were categorized into three groups: individual/personal, organizational, and media.

The most used source for safety information reported by this group was magazines and newspapers (media). Approximately 87% of the respondents reported using this source (Grieshop, 1999). The second most used source was the organizational source Farm Bureau (78%). The least used source reported by the group was electronic media (media) with 8.9%.

The respondents were asked to rate the usefulness of their sources. The choices for usefulness were “very helpful,” “somewhat helpful,” and “not helpful.” Only one category, “Other,” received a “very helpful” rating above 50%. This category related most often to what the researcher referred to as “one-on-one communication” (Greishop, 1999).

The findings of this study indicated that producers relied on a multitude of sources. However, no source seemed to be considered a clearinghouse for reliable safety

information based on the fact that only one source was considered “very helpful” more than 50 % of the time. The researcher also questioned how the print media could better engage producers. This source was used by 87% of the respondents but only 16% of those respondents deemed it as being “very helpful” (Grieshop, 1999). The author concluded that further research could possibly answer this question.

Another factor to consider is the type of clientele involved. Since the Cooperative Extension Service has a long history of serving the agricultural community, agricultural producers are usually more familiar with the services offered by the Extension office than other user groups.

In a study comparing dependency on the Extension Service for information between beef producers and government employees of Polk County, North Carolina, it was not a major surprise to find that beef producers relied more on the Cooperative Extension Service for information than those employed by local government (Clement, Richardson, & Mustain, 1995). While both groups listed newsletters as their most preferred method of receiving information, government employees had a higher preference for print information as compared to the beef producer’s preference of personal visits and field day demonstrations as their second and third choices.

A significant conclusion presented by the authors was that as extension expands into areas that are non-traditional (non-agricultural based), different delivery methods should be considered because traditional methods may not be as effective with newer clientele (Clement, Richardson, & Mustain, 1995).

An in-depth study of Michigan farmers’ information-seeking behaviors was conducted by Michigan State University (Suvedi, Campo, & Lapinski, 1999). The study collected data in two years, 1996 and 1999. The objectives of the study were to:

- 1) determine the types of Extension programs used by Michigan farmers
- 2) examine important sources of information used by Michigan farmers
- 3) determine if a relationship exists between information sources and certain demographic characteristics of farmers

A unique component of the study was that it examined information sources using a longitudinal study. The researchers believed that given increasing channels of information delivery, preferences would be changing over time. For this reason, data were collected in both 1996 and 1999.

The top three sources of extension information were extension newsletters or mailers (90.6%-1996 and 84.2%-1999), Extension bulletins or fact sheets (77%-1996 and 73.4%-1999), and visiting an Extension office (74.2%-1996 and 73.1%-1999) (Suvedi, Campo, & Lapinski, 1999).

Mass media (radio, television and newspapers) were the fourth-rated information source in 1996 (70.9%) and in 1999 (64.2%). The 1999 numbers reflected the largest decrease of the 13 preferred source categories selected for the study. While this finding seemed to be noteworthy, the authors did not further investigate to determine what contributed to this decline (Suvedi, Campo, & Lapinski, 1999).

Another finding in this study was that Internet usage was growing rapidly. Figures from the 1996 data indicated that only 1.4% listed Internet usage. By 1999, the figure was 10% (Suvedi, Campo, & Lapinski, 1999). Although respondents in 1996 and 1999 rated the Internet and other computer-based information sources as the least important, the 1999 respondents were more likely to rely on the Internet and computer-generated information than the 1996 group.

Suvedi, Campo, and Lapinski (1999) classified the information sources into four categories: print, electronic, organizational events and personal sources of information. The findings for 1996 and 1999 were similar in that Michigan farmers were more likely to rely on print information and personal sources than electronic or organizational sources.

When it came to mass media, the authors stated that no single source of media was dominant. Audiences can vary on preferred sources of information based upon a variety of variables. Some of these variables are farm size, farm income, age, off-farm employment, and education (Suvedi, Campo, & Lapinski, 1999). The authors suggested performing a detailed analysis of the target audience before developing a campaign to disseminate information regarding a particular program.

### **Interpersonal Communication**

In 1989, a study conducted in Nez Perce County, Idaho examined how farmers prefer to receive information and identified characteristics of farmers as related to their preferences for receiving information (Riesenberg & Obel Gor, 1989). Riesenberg and Obel Gor were concerned that even though mass media was efficient in reaching large audiences, limited results would occur if the target audience did not prefer mass media methods. For example, if farmers prefer direct interpersonal communication with an extension agent over that same agent writing a column in a newspaper or appearing on a radio program, then a mass media campaign by that extension agent would not be an effective method for communicating with the agent's clientele.

Surveys were sent to 386 farmers in the county whose names were on file at the county extension office. They received usable responses from 176 farmers for a response rate of 55%.



The most preferred method found by Risenberg and Ober Gol (1989) was the on-farm demonstration (54.3%) followed by tours and field trips (48.6%). The most preferred mass media methodology was publications with 19.4%. When responses were adjusted using a Friedman's Two-way ANOVA to create a mean score representing the nine methods of receiving information, publications was ranked third behind on-farm demonstrations and field trips.

When comparing mass media strategies utilized in the study, publications received the highest rating. The other two mass media methodologies, computer-assisted instruction and home study, were rated eighth and ninth.

Risenberg and Ober Gel (1989) further examined the preferences based on five independent variables: farm size, years farming, age, level of education and gross income. The results found were that younger farmers, age 20-35, gave the three mass media methodologies higher preferences than their counterparts. Education also played a factor with producers with higher education giving the mass media methodologies higher preference scores. Producers with larger farms were also more receptive to mass media efforts.

Risenberg and Ober Gel (1989) concluded that extension practitioners who disseminate agricultural information should recognize apparent patterns in preferences based on farm size, age, and educational status. The attitudes of the receivers of this information should be considered.

A study of Pennsylvania farmers regarding information on environmental issues found that educational activities such as on-farm demonstrations/consultations were preferred over mass media methods. The study did find that although mass media methods were not preferred sources, printed material such as newspapers, newsletters and

magazines were deemed as being important sources of information (Bruening, Radhakrislma & Rollins, 1992).

A study of dairy farm managers in the upstate New York area found that members of the feed industry are the preferred sources of information on issues regarding animal nutrition (Roseler, Chase, & McLaughlin, 1994). However, these feed industry members rely about equally upon the company nutritionist, magazines and journals, and the Cooperative Extension Service for their information. The authors of this study concluded that extension personnel were going to have to interact with individuals engaged in the feed industry in order to disseminate land-grant research or other information to dairy farm managers.

A 1995 North Carolina study examined how targeted extension clientele prefer to receive information. This study examined clientele in four major subject areas: agriculture, home economics, 4-H, and community development (Richardson, 1995). Seventy-seven clients chosen by a random sample from a population of 994 were interviewed by questionnaire. The study found that while these groups represented a broad range of topics, the preferred methods of receiving information were similar. The three preferred methods were personal visits, formal meetings, and newsletters (Richardson, 1995).

A second objective of the Richardson (1995) study was to determine if clientele perceived certain delivery methods as playing a more prominent role in the future. Respondents stated that computer software and computer networks (like the Internet) would play a major role and become important tools for receiving information in the future.

Richardson (1995) found that information sources considered “newer technologies” such as videocassettes and computers were becoming more popular and used more frequently. The researcher stated that individuals were becoming more familiar with these technologies and the advantages they offered.

Some evidence indicated that the type of crop being produced can influence agricultural producer’s information preferences. Genetically modified (GM) crops have been a controversial subject since their introduction into commercial farming, and farmers face a difficult decision in whether to proceed in using these types of crops. Alexander (2002) found that one high quality informational source could be more influential than the quantity of information.

Alexander (2002) looked at what role information played in growers adapting to GM corn seed. Alexander hypothesized that farmers who have more information are more likely to be early adopters of the GM seed. This hypothesis was not supported in her findings.

When the reliability of information based on the farmers’ perceptions was factored into the study, farmers with more information from the most reliable source, in this study, seed dealers, were more likely to use GM seed (Alexander, 2002). In a noteworthy development in this study, farmer concern over an outbreak of the European corn borer could have served as an extraneous variable that influenced farmer attitudes toward GM seed.

Homemakers are an audience that has been targeted by extension personnel for many years. Boone and Zenger (2001) examined the preferred communication channels of Kansas homemakers. Information produced by the extension service specifically for

this audience has included topics such as food preparation, parenting skills and home gardening.

Six homemaker focus groups were examined throughout the state of Kansas. Two groups represented senior citizens, one group participated in a literacy class and in the Expanded Food and Nutrition Education Program (EFNEP) which is aimed at lower-income families, another group was stay-at-home mothers, with the two remaining groups being individuals of different ages with a majority working outside the home (Boone & Zenger, 2001).

Two variables affected how homemakers preferred to receive information. Income and employment status influenced the information preferences. The groups all used mass media regularly, but these sources were used only as awareness tools (Boone & Zenger, 2001). Many of the homemakers had a trust issue with mass media information. Homemakers who used extension information preferred to receive a newsletter mailed to them.

Lower income homemakers were more likely to seek interpersonal communication channels than other groups. This group was more likely to use the telephone to seek information from an experienced person and rely on an individual who had gone through a similar experience (Boone & Zenger, 2001).

Stay-at-home mothers and lower-income individuals were less likely to know how to contact the extension service. The authors found that if these groups could make contact with extension personnel quickly and conveniently, they would be more likely to use extension services and information.

Homemakers unfamiliar with the extension service commented that the mass media would be a good way to familiarize themselves with information provided by the

extension service (Boone & Zenger, 2001). The authors concluded that a disconnect had occurred between homemakers and the extension service and that a renewed campaign must be undertaken to better serve this once traditional audience.

Information related to environmental practices is an important arena for agricultural producers due to increasing regulatory practices or the threat of more stringent regulations. Tucker and Napier (2002) sought to determine the preferred sources and channels of farmers in three midwestern states for soil and water conservation information.

The study found that a variety of sources was used for soil and water conservation information, and government agencies and agricultural chemical dealers were the most frequently used sources (Tucker and Napier, 2002).

Farm magazines were the preferred channel used by the farmers (Tucker and Napier, 2002). The authors noted that differences existed among the three states (Iowa, Minnesota, and Ohio). Farmers in Ohio preferred television more than the other two states. The reason given by the researchers was that a long-running agricultural network had a large and loyal audience (Tucker and Napier, 2002). Farmers in Minnesota had a higher preference for the Internet than the other states. This result was attributed to the fact that farmers in Minnesota were younger and more familiar with technology and more educated than farmers in Ohio and Iowa.

Vergot III, Israel, and Mayo (2005) sought to examine the sources and channels used by beef cattle producers in northwest Florida. The study sought to determine what sources were most popular and which delivery methods were preferred by the producers.

The most popular source favored by the producers included other producers. More than 80% reported using other producers as sources of information (Vergot III, Israel, &

Mayo, 2005). Sources that were reported being used at least 50% of the time also included county extension agents, veterinarians, local farm suppliers and university specialists.

For channels preferred by beef producers in northwest Florida, printed information was the most often used (Vergot III, Israel, & Mayo, 2005). Printed information distributed by extension agents such as bulletins and newsletters were very popular among the producers, ranking first and third in popularity according to the study.

A theme echoed by the Vergot III, Israel, and Mayo study (2005) regarding the distribution of information by extension agents was that multiple channels should be used in order to reach the largest audience. Individual preferences vary, and in order to contact the most end-users of information, various channels should be utilized.

Like beef producers, horse owners are another clientele that has been targeted by extension programs. Israel and Wilson (2006) sought to identify the information sources and channels used by Florida horse owners and determine if patterns existed between the sources and channels.

Florida horse owners reported usually or always using a veterinarian (82%) as an information source. Other popular sources included farriers, other horse owners and horse trainers. County extension agents, consultants, and close relatives who owned horses were cited as the least-used sources (Israel & Wilson, 2006).

When it came to the use of information channels, the most commonly used channels were equine magazines and horse or farm magazines. Channels used by extension personnel were not very popular according to Florida horse owners. These extension channels included bulletins, fact sheets, and county newsletters (Israel & Wilson, 2006).

A factor analysis was performed on the 16 methods that Florida horse owners used to acquire information. From this analysis, four basic sets were identified. The authors found that the extension service was included in only one set. Because of this finding, it was suggested that extension personnel would need to utilize other methods for the delivery of educational programming and materials in order to reach segments of Florida horse owners (Israel & Wilson, 2006).

Some of the recommendations suggested by Israel and Wilson were similar to the findings of Suvedi, Campo, and Lapinski, (1999) and Licht and Martin (2006). Extension clientele use many channels, and it is important for extension personnel to develop partnerships with other sources in order to promote extension programming. By identifying the most-used sources and channels, extension personnel can develop a more comprehensive plan for disseminating information.

### **Electronic Media**

While television and radio were considered unreliable in the Padgitt (1987) study, some Midwestern cash grain farmers found radio and television the most useful source for marketing information (Batte, Schnitkey, & Jones, 1990). The groups that found radio and television the most useful were older producers and operators of smaller farms.

Batte, Schnitkey, and Jones (1990) examined the influence of 22 different information sources regarding marketing information. Their findings indicated that radio was the single most important source according to 19.2% of the respondents. Another 8.1% indicated that television was the most important source. When radio and television are combined, more than 27% reported broadcast media as the most important source. The researchers suggested that these sources provided a daily outlook of the current

market conditions along with some analysis of trends in the market which was useful to the farmers.

Marketing decisions can be a perilous situation for farmers. Often times, these decisions are made months before harvest or when yields can be accurately predicted. Because the decisions are based on predicted future results, farmers may be looking for information that suggest market conditions in the coming months or even years.

Because farmers are seeking information regarding future trends, information sources that are produced periodically were found to be the most valuable for Midwestern cash grain farmers (Batte, Schnitkey, & Jones, 1990). More than 34% reported sources such as general farm magazines, USDA and government publications and commercial newsletters as being the most valuable regarding marketing information. The authors concluded that these sources have a longer timeframe of analysis than broadcast sources for the current crop or for future crops.

Batte, Schnitkey and Jones (1990) also found that farm size, age, and education levels are factors affecting the information sources used by midwestern cash grain farmers. Statistically significant differences were found between small farms (less than 600 acres) and large farms, older farmers (age 50 and over) and younger farmers, and farmers with some college education as compared to those with high school education or less.

Small midwestern cash grain farmers were much more likely to cite broadcast sources as the most useful source of marketing information than large farmers. Large farmers were much more likely to cite marketing professionals (certified public accountants, extension service personnel, marketing consultant service, or a brokerage firm) as their most important source of information (Batte, Schnitkey, & Jones, 1990).



Batte, Schnitkey, and Jones (1990) found a statistically significant difference between older farmers and younger farmers with regard to broadcast information sources. Older farmers were more likely to cite broadcast sources as the most important source for marketing information than younger farmers. Younger farmers reported that periodic information sources were the most important source, but the findings were not statistically significant between the two age groups for this source.

With regard to education, midwestern cash grain farmers with some college education were more likely to indicate professional marketing sources were the most important source of marketing information. Twenty-seven percent of this group reported professional marketing sources as the most important while only 11% of those with high school education or less reported marketing professionals as the most important source (Batte, Schnitkey, & Jones, 1990).

Licht and Martin (2006) examined how Iowa corn and soybean producers use different communication channels. The authors stated that information gained from the study would be useful for extension personnel in developing programs and the delivery of program information.

The most frequently used information channels by Iowa corn and soybean producers were radio and personal consultations. These consultations could be with extension employees, agricultural company representatives, friends, or other producers (Licht & Martin, 2006).

The main reason for using these sources according to the producers was that radio provided timely information quickly and could be listened to while accomplishing other tasks such as driving farm equipment or feeding livestock. Consultation was cited as

being the quickest way to acquire information regarding a specific area of interest, and a consultation generally provided reliable information (Licht & Martin, 2006).

Iowa corn and soybean producers stated that mass communication channels were satisfactory in delivering general agricultural information. If the issue was complex or more specific information was needed, then most producers favored employing an interpersonal communication channel. Many times the producers would seek out an extension employee for this consultation (Licht & Martin, 2006).

The authors concluded that producers use a variety of communication channels. Because many channels are used, extension educators should plan on using multiple approaches. Extension educators should also recognize the influence that personal consultations have on producers. Producers consider consultations as a way to filter many of the messages they received regarding agriculture. Because of the high reliability of consultations stated by producers, consultations should be a fundamental part of any information campaign (Licht & Martin, 2006).

While the Cooperative Extension Service (CES) is active in the agricultural community, not all farmers use the services provided. A study of Oklahoma wheat farmers was conducted to determine how wheat farmers receive information (Kelsey & Maringer, 2004). Of interest to the researchers was a subpopulation that was referred to as “non-CES users.” Two of the objectives of this study were to identify differences in information sources preferred by CES users and non-CES users and develop the most effective means to communicate with non-CES users.

Kelsey and Maringer (2004) found that CES users and non-CES users used all 16 levels of potential information sources used in the study that were not considered CES-related such as non-extension faculty, trade journals, newspapers, television and radio.

While non-CES users used the same sources, they used all sources significantly less and were also less likely to consult with other university personnel or with agricultural businesses and suppliers.

On the subject of communicating with non-CES users, direct mailing of information to farmers was the most preferred method. The authors concluded that a mass media campaign through mass mailings, newspapers, radio and television would be useful in reaching those wheat farmers who were not familiar with the information provided by the Extension Service.

While the Cooperative Extension Service has a long history of working with rural families and agriculture, farmers are not the only group targeted by Extension. Information with a focus on general topics such as housing, child care, and human nutrition are areas in which much information has been disseminated by the Extension Service.

Members of agricultural associations are often engaged in lobbying efforts to promote agriculture. An example of such an association is the American Farm Bureau Federation. This organization is often engaged in helping shape agricultural policies at the national level.

Farm Bureau is also active at the state level. In Louisiana, the Louisiana Farm Bureau Federation helps shape state farm policies by actively working with state regulatory agencies and legislative officials. Many other states have similar Farm Bureau organizations.

A study of Florida Farm Bureau members sought to determine the communication preferences within the organization. This study also looked at a group within the organization who were considered politically active. For the study, a person was

considered politically active if they contacted their local, state and federally elected officials on a routine basis (Telg, Basford, & Irani, 2005).

The four communication modes used in this study were: telephone, postal mail, fax and electronic mail. Respondents were asked to rank the four methods as to how they prefer to receive information. Postal mail was the most preferred method. Electronic mail was ranked the least preferred method by more people than any other method. It received two more votes as the least preferred method than did the telephone (62 votes for electronic mail vs. 60 for the telephone).

Although electronic mail received the most votes for being the least preferred method (62), it received 65 votes for being the most preferred method ranking it second behind postal mail with 82 votes (Telg, Basford, & Irani, 2005). It appeared there was a split over the technology involved with electronic mail, and the authors indicated that further research would need to be performed to determine the cause of this finding.

Politically active members' preferences for communicating were influenced by the political level of the individual they were contacting. The category of personal meeting was added to the five possible preferences for communicating given, and respondents could choose multiple methods of communicating.

For the local level, personal meetings were the most preferred method. Telephone was the second most preferred method followed by postal mail, electronic mail and fax.

At the state level, telephone was the most preferred method. A personal meeting was the second most preferred method followed by postal mail, electronic mail, and fax.

At the federal level, postal mail was the most preferred. Telephone was the second most preferred method followed by personal meeting, electronic mail, and fax.

The federal government plays a significant role in shaping national farm policy. Much of this farm policy is dictated by Congress through the passing of a Farm Bill. This farm bill is administered through the USDA and includes programs such as crop insurance, conservation compliance requirements, food safety compliance programs, and payment programs.

The Farm Bill is a complex piece of legislation that can be difficult to understand. To help decipher the meaning of the Farm Bill, people will turn to a variety of information sources that help better explain its complexities. Catchings, Wingenbach, and Rutherford (2005) examined what information sources Texas agricultural board members relied upon to learn about the 2002 Farm Bill and what was the perceived value of these sources.

The most valued source for information regarding the 2002 Farm Bill was the Texas Cooperative Extension Service followed by farm publications and agricultural Internet sites. The highest rated mass media outlet was regional newspapers (defined as Texas newspapers) which was rated sixth out of the 15 possible sources. Radio was ninth, and television was rated 12<sup>th</sup> (Catchings, Wingenbach, & Rutherford, 2005).

The researchers did not indicate how agricultural board members acquired information from the Texas Cooperative Extension Service. Information could have been gained through interpersonal communication methods with extension employees, extension newsletters, or visiting the extension website. How this information was acquired could have indicated a preferred method of communication by Texas agricultural board members with the Texas Cooperative Extension Service. Based upon the scores given to mass media sources, it was doubtful if mass media methods were used by extension service employees.

The Catchings, Wingenbach, and Rutherford (2005) study did indicate that most mass media outlets were not highly valued for acquiring information related to the 2002 Farm Bill. While farm publications was regarded as the second-highest rated source, most of the mass media outlets were in the bottom half of the 15 listed sources.

### **Factors Influencing Information Sources and Preferences**

Previous research indicates that agricultural producers use a variety of information sources. Factors such as the topic for which information is sought, the audience seeking information, and the personal preferences of the individuals can influence the information channel or source.

Other factors can influence the information source or channel. Obviously, the availability or lack thereof of an information source would be influential. The timeliness of the issue in question would be a determining factor. If an answer is needed quickly regarding a problem with an insect, an agricultural producer would probably seek an answer from an interpersonal source of communication such as another producer or an entomologist with a land-grant university. The likelihood that a mass media outlet such as radio or television would be broadcasting information at a timely moment would be small.

Demographic characteristics have been shown to influence agricultural operations. Hall and Rhoades (2009) found that age was a factor among Ohio grain farmers' attitudes toward organic and non-organic farming. Because many of the farmers were over 50 years of age, these farmers could be more focused on retiring in the near future and not interested in adopting organic farming practices. This same study also indicated that education could influence exposure to organic farming practices. The authors noted that the majority of the respondents in the study reported their highest level

of education as being high school graduates, and these farmers may have not been exposed to organic farming practices in a high school curriculum.

Another demographic characteristic that research has shown to differentiate the type of farming operations is the number of years engaged in farming. McCann et al, (1997) found that Michigan conventional farmers had been engaged in agricultural production nearly twice as long as their organic counterparts.

Some of these same characteristics seem to play a role in the selection and preferences of information sources by agricultural producers. Demographic traits such as age, education and size of farm have been identified as being influencing factors.

The age of the producer is one factor that has been influential in selecting information sources. In studies by Risenberg and Obel Gor (1989) and Batte, Schnitkey and Jones (1990), older farmers seem to favor more interpersonal communication with individuals involved with agriculture while younger farmers preferred mass media sources.

The size of the farm (acres) is another factor that plays a role in information channels. Park and Mishra (2003) found that larger farmers seek more information due to the fact that agronomic decisions carry significant economic risks. These farms have a large amount of money invested in equipment along with a considerable amount of input costs related to producing crops. Producers on large farms are consumers of information and are more likely to use more sources than smaller farms.

### **Influence of Communication Sources and Theories of Mass Communication**

There have been numerous studies focusing on the effects of information sources on the behavior of people. Many have looked at the influence of the mass media upon the recipients of messages delivered by print publications, radio, television, or the Internet.

One of the earliest theories devoted toward mass communication was the magic bullet theory. This theory was based on the premise that all media messages would reach every individual in the same manner (Lowery & DeFleur, 1995). These messages (bullets) would be responsible for changing the behavior of everyone who was “struck.” Therefore, the media was an all powerful tool that could exert its will upon the masses unknowingly.

Two communication theories of interest in regard to how agricultural producers receive and process information are the two-step flow of communication and the diffusion of innovations theory. Both theories consist of essential elements that are found throughout agricultural and rural communities, especially the diffusion of innovations theory which had its roots in a study examining the adoption of hybrid corn seed.

Interpersonal communication is the basis for the two-step flow of communication theory. As discussed in previous research by Boone and Zenger (2001) and Licht and Martin (2006), interpersonal communication is prevalent among individuals in agriculture and rural communities. The popularity of commodity groups is another example of how interpersonal communication occurs throughout agriculture audiences.

The two-step flow process is based upon the research of Lazarsfeld, Berelson, and Gaudet in their examination of the Erie County, Ohio election of 1940. This study sought to determine the influence of mass media in persuading voters in a national election. The findings of this study indicated that interpersonal communication was present and plays a key role in the dissemination of messages from the media to their audiences (Lazarsfeld, Berelson, & Gaudet, 1944).

The discovery that certain individuals (i.e. opinion leaders) exert more influence over individuals than the mass media contradicted the magic bullet theory. Under the



magic bullet theory, the media was all powerful. While the media still had a role in shaping opinions, people were now part of the equation. According to Katz and Lazarsfeld (1955), people served as intervening factors between the media and the audiences of the media. In fact, usually these people could be more influential than the media.

An essential part of this theory lies with the intermediaries who are considered to be opinion leaders. These opinion leaders are the recipients of media messages and then pass these messages to others. In the seminal study of Lazarsfeld, Berelson, and Gaudet (1944), the theory was based upon “ideas often flow from radio and print to the opinion leaders and from opinion leaders to the less active sections of the population” (p. 151).

These opinion leaders are more exposed to the media and are recognized as reliable sources of information. At times, these opinion leaders will share the messages adding their own personal views or interpretations. For complex ideas or for important decisions (such as voting in an election or what crops to plant), opinion leaders can sway opinion.

A basic premise of this theory is that interpersonal communication is more persuasive than messages received from the mass media, and interpersonal communication is the dominant method for receiving information (Stone, Singletary, & Richmond, 1999). Another component of this theory is that opinion leaders are present at all levels of society and that the flow of influence is horizontal and not vertical (Baran and Davis, 2003). People seen as opinion leaders influence their peers much like a farmer influences another farmer.

Using opinion leaders to convey messages to an audience is a fundamental principle in the two-step flow approach. In investigating the communication channels

employed by Florida opinion leaders, Ruth and Lundy (2004) sought to identify the preferred communication channels of opinion leaders in order to improve the communication of agricultural messages. By identifying the channels preferred by opinion leaders, the researchers stated that agricultural communicators could be more effective in developing campaigns to support the agricultural industry.

The most preferred communication channel of Florida opinion leaders for agricultural information was newspapers followed by television, government agencies, radio and personal contacts (Ruth & Lundy, 2004). This finding lent partial support to Lazarsfeld, Berelson, and Gaudet's (1944) premise that "ideas flow from radio and print to opinion leaders." Television was not a significant player in the communication field in the 1940s when the Erie study took place, hence its omission in the seminal study.

The study did not list the manner in which opinion leaders preferred to gather information from government agencies. Whether it was from reading agency websites, press releases, or through personal communication with agency representatives, the authors did not state the method (Ruth & Lundy, 2004).

Without knowing this information, personal contacts was the highest rated interpersonal communication source, finishing behind three mass media sources (newspapers, television, and radio). Ruth and Lundy (2004) indicated that since the population consisted of opinion leaders, this group was less likely to use personal contacts which may have influenced the results of this study.

The authors did state that Florida opinion leaders used a variety of sources. This finding is similar to what other studies have found regarding information sources for agricultural producers. It appears that using multiple channels and sources would be necessary components of an information campaign aimed at these audiences.

Diffusion theory is a product primarily of research done by rural sociologists. These scientists were trying to explain how developments in areas such as technology, health and science were put into practice by specific segments of society. The farming and rural communities were a societal system that was targeted by practitioners and the focus of much of the original research in this area.

While not the author of some of the earliest work involving diffusion theory, Everett M. Rogers is renowned for his work regarding diffusion. Rogers (1983) defined diffusion as, “the process by which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas” (Rogers, p. 5).

Rogers stated there are four elements of diffusion of innovations. They are the innovation (new idea), communication (from one individual to another), social system, and time (Rogers, 1962).

The speed with which an innovation is adopted is based on five characteristics (Rogers, 1962). The characteristics are:

- 1) Relative advantage: the degree to which an innovation is perceived as better than the idea it supersedes. Many times this advantage is measured in economic profitability (costs less, yields more, saves time, etc.)
- 2) Compatibility: degree to which an innovation is consistent with existing values and past experiences of the adopters. An idea that is at odds with the cultural values or norms of the societal system lacks compatibility and generally will fail. Rogers uses beef production in India as an example of an incompatible innovation.

- 3) Complexity: degree to which an innovation is perceived as difficult to understand and use. If an innovation is complex, its rate of adoption will be slower.
- 4) Divisibility (Trialability): degree to which an innovation may be experimented with on a limited basis. If an innovation can be tried on a trial basis, the more likely it will be adopted.
- 5) Communicability (Observability): degree to which the results of an innovation may be diffused to others. If results are easily observed and communicated to others, the more likely they will be adopted.

Communication channels play a significant role in the communicability characteristic. These channels are the conduit for how messages are transmitted and received. Mass media channels have been supported by research (Boone & Zenger, 2001; Licht & Martin, 2006) as being an effective and efficient means for increasing basic awareness and knowledge of a concept. When the issue is more complex, interpersonal communication is often more effective in getting an individual to adopt an innovation.

In some of his earlier research regarding diffusion, Rogers categorized information sources as being cosmopolite or localite (Rogers, 1963). Cosmopolite sources are sources from outside an individual's community or everyday life. Cosmopolite sources are generally impersonal such as the mass media, but they can involve personal contacts such as a discussion with a national or international expert who does not live or work in the community. These sources are most important at the awareness stage.

Localite sources are simply local sources. These are individuals such as a neighbor or someone with whom an established relationship exists and is maintained.

Localite sources are considered the most important at the evaluation stage (Rogers, 1963).

In his later works on diffusion, Rogers uses the term homophily as a crucial key to the likelihood of adoption (Rogers, 1983). The term describes the comparative similarity between two individuals in the same societal setting. A peer is more likely to influence a like individual than an outside source. Rogers even goes on to say that “opinion leaders conform more closely to social system norms than the average member” (Rogers, 1963, p. 72). The sway of opinion leaders is strongest among peers and is supported by Baran and Davis’ (2003) assertion that influence is generally horizontal and not a vertical phenomenon.

The seminal study that brought the four elements of diffusion together was the Ryan and Gross Hybrid Corn Study of 1943. Ryan and Gross looked at the adoption rate among Iowa farmers in two communities to the usage of hybrid corn seed from 1928 to 1941.

Ryan and Gross interviewed 259 farmers for the study. The researchers were trying to determine what information and processes were used in the decision to adopt the new hybrid seed. One of the initial findings of the study was that most of the early adopters used the hybrid seed on an experimental basis. Even the late adopters after seeing the success of early adopters planted on average only 30% of their crop in the new seed (Ryan & Gross, 1943).

Communication was an important factor that influenced adoption. Salesmen of the hybrid seed corn were often the first source of information with 49% of the farmers reporting salesmen as their original source (Ryan and Gross, 1943). These salesmen would be considered in most instances a cosmopolite source. The most influential source

came from other farmers and that an increase in yield of early adopters could be seen by other farmers (communicability).

The mass media was helpful in bringing hybrid seed to the attention of Iowa farmers, but not necessarily the adoption of the seed in their fields. Approximately 20% said that farm journals and radio advertising were their first source of information regarding hybrid seed. Only 2.3% cited farm journals as being the most influential and none of the respondents recognized radio advertising as being the most influential (Ryan & Gross, 1943).

From their findings, Ryan and Gross deduced that salesmen were major sources for introducing farmers to the concept of using hybrid seed, but local individuals were more likely to convince their peers to actually plant the hybrid seeds. This finding would support Rogers' later declaration that local sources are more influential (Rogers, 1962).

The theory of diffusion has been examined in communication studies as well. In the two-step flow of communication, the concept of media introducing ideas to opinion leaders and those opinion leaders communicating through interpersonal means and influencing others interrelates diffusion and the two-step flow. Both theories are built on the notion that opinion leaders and early adopters can influence others via interpersonal communication.

Defleur (1995) stated that the adoption of mass communication methods involves the use of innovation theory. The people who read the first American newspapers were early adopters as were farmers who used the radio to help make decisions on the marketing of their crops. Even with the modern communications devices such as iPhones and satellite radio along with access to the Internet via personal computers, personal communication still plays a pivotal role in the communication of ideas and new concepts.

In some cases, diffusion and interpersonal communication are intertwined. When major news events occur, the mass media is busy gathering and presenting information to the public. At the same time, discussions among individuals related to the major events are happening. Examples of such events are the terrorists attack on September 11, the election of Barack Obama in 2008 and the outbreak of swine flu in the spring of 2009.

In the case of major news events, the time of the event is obviously a factor in how an individual may become aware of the event. Access to other people and to media outlets will likely influence the method by which an individual will learn of the event. Another factor that influences how one learns of a major news event is the location of the individual when the event occurs. Greenberg (1964) found that those individuals who were at work at the time of the Kennedy assassination were more likely to learn from another person than from a mass media source. For those at home, the mass media were more likely to be the information source.

While much of Rogers' work on diffusion focused on events or ideas that occurred over longer periods of time, Greenberg's study looked at an event in which information was spread throughout the country for most in a matter of minutes. He determined that personal communication played a larger role in both the initial discovery and provided supplementary information than previous studies related to diffusion (Greenberg, 1964).

In the arena of agriculture, several variables may influence the adoption of a new innovation such as a new seed variety or new farming technique. Age, education, and the size of the farm are some examples of these variables.

Daberkow and McBride (2003) examined how another variable, awareness, would influence U.S. farmers in adopting the innovation of precision agriculture (PA).

The authors found significant differences between individuals who were aware of PA techniques and those who were unaware. Those aware of PA techniques were younger, better educated, more likely to be full-time farmers, and more likely to use risk management tools in their operations.

Another interest of Daberkow and McBride was the role that awareness factored into the adoption of PA. They sought to determine of those farmers who were aware of PA what factors influenced their decision to adopt these techniques.

One source of information concerning those aware of PA techniques was the mass media. Of the non-adopters who were aware of PA, 53% identified the media as a major source of information while only 25% of the adopters did so (Daberkow & McBride, 2003). Personal sources such as input providers or crop consultants were the information sources more likely to influence the early adopters. Adopters also were more likely to be full-time farmers, larger, located in the heartland (consisting of portions of Nebraska, Missouri, Minnesota, Ohio, and Kentucky and all of Iowa, Indiana and Illinois) and producing cash grain and oilseed crops.

The most interesting finding from this study was that awareness was not a factor in limiting PA diffusion. The researchers suggested that a public or private information campaign to all farmers would not enhance the adoption of these techniques. It would seem that farmers who would most likely benefit from PA techniques have previously received information from vendors or extension personnel and perhaps a campaign would be redundant and accomplish little (Daberkow & McBride, 2003).

Organic farming has become an increasingly popular technique here in the United States and in Europe. In Europe, less than .1% of the total farms were categorized as being organic farms in 1985 (Padel, 2001). By 1999, this figure was approaching 2 %.



In examining organic farmers, Padel sought to examine what role information sources had on the innovation to adopt organic farming practices. Padel (2001) found that organic farmers showed a reliance upon other organic farmers for their information. Interpersonal communication played a significant role in the sharing and gathering of information.

Organic farmers also showed a preference toward sources that specifically focused on organic farming such as other farmers, specialty publications or organic advisors (Padel, 2001). These farmers were less likely to use established sources that serve the general agricultural industry including the farming press and agricultural consultants.

Another communication theory that has applications toward agricultural producers is the uses and gratifications approach. This approach was different in that theorists began to examine the interaction of people and the media. Rubin (1994) sought to clarify it as “what people do with the media, instead of what the media do to the people.”

One of the earliest efforts to examine uses and gratifications can be found in Herzog’s (1944) study of daily radio serial programming. Herzog sought to determine what, if any, gratifications listeners received. The initial analyses revealed three primary gratifications: receiving an emotional release, opportunities for wishful thinking and gaining advice. The idea that knowledge would be gained for advice-seeking listeners played a pivotal role in participants choosing to listen to the program.

Shortly after Herzog’s research, a study by Berelson sought to determine what expectations readers had towards newspapers and whether newspapers were fulfilling these expectations. Findings of the study regarding the gratifications gained from reading

newspapers included both rational and irrational (non-information seeking behavior) components (Berelson, 1949). He found that many individuals exhibited rational behavior components in that newspapers were read in order to obtain information while others read for escapism or because it was habitual. Berelson (1949) noted five key uses of the newspaper: information and interpretation of public affairs, a tool for daily living, escapism, social prestige and the simple joy of reading.

Berelson noted that people's behavior could be influenced by either their ability to read the newspaper or the inability to read the newspaper. Reading the newspaper was a highly ritualized activity that when taken away could cause anxiety in readers (Berelson, 1949).

Television was relatively new to the general population when the Television in the Lives of Our Children studies began in 1958 (Schramm, Lyle, & Parker, 1961). In this study, the authors were not focusing specifically on the effects television may have on children but why they viewed television.

During the study, the researchers determined that the young viewers sought out programming that met specific needs or interests (Schramm, Lyle, & Parker, 1961). Children were not passive when it came to viewing, and the researchers stated that they were "active agents" seeking out gratification through specific programming.

There were 11 different studies comprising the Television in the Lives of Our Children, and the researchers concluded that three primary reasons for viewing existed: entertainment, social utility and information (Schramm, Lyle, & Parker, 1961). It was possible that a single program could meet all three criteria.

A study that helped further refine the uses and gratifications approach involved exploring how adults in Israel used the media. Katz, Gurevitch, and Haas (1973)

interviewed approximately 1,500 adults seeking to understand why certain media types were used.

Katz et al. (1973) discovered that people's needs are either institutional or individualistic. People need and see the media as an institution fulfilling a basic purpose such as providing the general public with information to be used in decision making. The individualistic view refers to meeting a person's specific need. An individual may turn towards a specific media type to fulfill certain needs such as television images to reinforce a message.

Much like television was a new medium in the 1950s, the Internet became a media phenomenon in the 1990s. This new medium opened up another avenue for researchers to study.

Eighmey and McCord (1998) examined how users evaluated five commercial websites based upon the users' experience on visiting and interacting (browsing) the websites. The study was seeking to determine whether some of the basic tenets of the uses and gratifications theory applied to the World Wide Web.

In looking at how visitors perceived the five websites, it was determined that entertainment, personal relevance and information seeking were important to users and expected outcomes (Eighmey & McCord, 1998). This finding reinforced some of the main findings of previous studies related to uses and gratifications of other media.

Eighmey and McCord (1998) concluded that website construction and design should be strategically planned in order to meet the needs of the end users. The reasons stated were that websites needed to be both informative and entertaining to help meet the gratifications of visitors, organized in a manner that is logical to help visitors navigate to

find the information they are seeking and websites should have design features that minimize the amount of time needed to download pages (Eighmey & McCord, 1998).

Researchers began to look at the uses and gratification theory specifically related to the Internet. Stafford, Stafford, and Schnadke (2004) sought to find if there were aspects of uses and gratification that were unique to the Internet as compared to other forms of media.

In examining the Internet usage among customers of America Online (AOL), it was determined that users had similar gratifications as previous media such as information seeking and entertainment (Stafford, Stafford, & Schnadke, 2004). The researchers found the Internet had social gratifications that were unique to the media. They found that concepts unique to Internet-based media, such as “chatting,” “friends,” and “interaction” were gratifications that could not be found with traditional media such as newspapers and television and should be considered Internet social gratifications (Stafford, Stafford, & Schnadke, 2004).

A key finding in these studies was that information-seeking played a major role. Individuals looked to the media for answers. Whether it is newspapers, radio or television, the media was a source counted on by adults and children to provide information.

The uses and gratifications approach has applications related to agriculture entities. Individuals engaged in agricultural enterprises are often seeking information to help them become more efficient and productive growers and producers. Therefore, they will often use sources that help them achieve this goal.

In the study examining how Florida horse owners use sources and channels for information, Israel and Wilson (2006) indicated that the affective and emotional needs of

the horse owners influenced the sources and channels used for acquiring information. The researchers recommended that extension agents seeking to reach horse owners use multiple channels. By using multiple channels, extension agents would be more successful in reaching a larger audience. Audience expectations and gratifications of different channels were not similar, therefore horse owners used a variety of channels depending upon what type of information they were seeking.

### **Summary**

Research in this study sought to determine the roles of mass media sources and interpersonal sources regarding agricultural production. Research was guided by the notion that agronomic crop producers and consultants had preferences for receiving information, and research would indicate whether the preferred method involved a mass media source or interpersonal communication source.

In diffusion theory, the type of source plays a role in the adoption of an innovation. Rogers (1983) posited that sources were either cosmopolite or localite. A mass media source would be considered a cosmopolite source. A localite site is a local source in which a relationship has been established. This study sought to determine how agronomic crop producers and crop consultants used or perceived these two types of sources.

Rogers (1983) also said the adoption of innovations involved opinion leaders and change agents. Research questions were designed to establish the preferred sources for specific components of agronomic crop production. By identifying the sources being relied upon for information regarding these components, these sources could be conceived as taking on the role as change agents regarding new innovations related to production agriculture.

In the uses and gratification approach, information-seeking or advice was one of the primary reasons individuals used sources such as the media. For this study, the researcher sought to determine the usage of selected sources for information. In particular, the researcher wanted to know how often information distributed by the LSU AgCenter was used in specific components of agricultural production by both producers and consultants. The researcher also sought to determine the perception of the quality of the information being distributed by measuring the accuracy of its information.

Katz, Gurevitch, and Haas (1973) stated one of the principal uses for media related to information, knowledge and understanding needs regarding issues in individuals' everyday lives. They also sought to determine what other sources beside the mass media were useful in this arena. They found for personal needs the role of the media declines. The researcher used this information to devise questions to determine whether mass media was fulfilling a basic need for information related to agronomic crop production, or like the Katz et al. (1973) findings, non-media sources were more important sources.

Communication and agriculture have been intertwined in the United States for more than two centuries. Agriculture producers have used the media and continue to use the media to acquire information regarding factors that influence their farming operations.

Previous research indicated that several factors may influence the methods by which producers seek information. One demographic factor that influences how farmers receive information is age. Some studies have found a significant difference in the information preferences between young and older producers.

The information channel used by an agricultural producer may be influenced by the topic in which information is being sought. Environmental decisions may cause a producer to seek information from a mass media source while a seed variety decision could inspire a farmer to make inquiries with a seed company representative or fellow farmer.

The size of a farm can influence the amount of information being sought. Larger farms typically are confronted with more decisions, and these decisions generally involve a larger capital investment. Because of these factors, larger farms seek more information and use more sources to acquire this information.

Because previous research has indicated that there are characteristics that influence the information sources used by individuals involved in agriculture, the researcher used this information to guide his research. This study sought to determine the preferences agronomic crop producers and crop consultants had regarding receiving information related to crop production. Questions on the researcher's instrument were designed to determine who the preferred sources were for the two populations.

Previous research (Licht and Martin, 2006 and Roseler, Chase, & McLaughlin, 1994) had indicated that interpersonal communication was the preferred method for receiving information related to agricultural issues. Other studies (Batte, Schnitkey, & Jones, 1990 and Grieshop, 1999) found that the mass media was a preferred method for this information. Because of these two competing views, the researcher formulated his research to determine whether interpersonal communication or mass media played a more prominent role in presenting information related to crop production.

Finally, communication theory research is still very applicable to the agricultural industry. The heavy reliance and usage of interpersonal communication among members of the agricultural industry and between fellow producers is evident in previous research. The adoption of new seed varieties and new agronomic practices is also a fertile field that is an opportunity for further research. Hall and Rhoades (2009) in their study of Ohio grain farmers' attitude toward organic farming suggested additional research should focus on the communication channels farmers use when considering adopting of a farming practice such as organic farming.



## **CHAPTER THREE**

### **METHODOLOGY**

#### **Population and Sample**

This study was designed to gather information from two distinct populations that are important clientele of the LSU AgCenter. One target population was large agronomic crop producers (producers farming more than 200 acres) located in the state of Louisiana. The second population was Louisiana agronomic crop consultants who serve clients in the state of Louisiana.

According to the 2010 Louisiana Agricultural Summary (Louisiana Cooperative Extension Service, 2011), agronomic crops were produced in 45 of Louisiana's 64 parishes. Based upon the 2011 summary, there were 6,275 agronomic producers in the state. However, this number is inflated due to the fact that agronomic crop producers in some instances produced multiple agronomic crops. For example, a cotton producer may also produce soybeans and is counted as both a cotton and soybean producer. This phenomenon leads to an inflated number regarding the size of agronomic crop producers. The actual number of unique individuals will be less than 6,275.

For this study, the accessible population was agronomic crop producers attending specific commodity group meetings across Louisiana. These commodity meetings were held at several locations across the state and represented areas of Louisiana that are heavily engaged in agronomic crop production.

The sampling plan included the following steps:

- The first step was identifying the major agronomic commodity meetings held in Louisiana. The researcher consulted with AgCenter crop specialists who have

statewide responsibilities regarding specific agronomic crops to help identify the commodity meetings. Extension agents with agronomic responsibilities in parishes with significant agronomic crop production were consulted for their input regarding the most important commodity meetings. Criteria used to identify these meetings were past attendance, prestige of past guest presenters, the number of years the meeting has been regularly held and its relationship with producers.

- The researcher contacted the coordinator for each meeting and made a request to be placed on the program. The request included time to explain the purpose of the study and administer the instrument.
- Based upon previous attendance figures provided by the coordinators of these meetings, the researcher estimated that between 750-800 potential contacts would be made at these meetings. This estimate used the lowest numbers provided by the coordinators and was at the time considered to be a conservative estimate.
- The commodity meetings were held in January and February 2011. The commodity meetings identified by the state specialists and extension agents with agronomic crop responsibilities as being the most important were the following:
  - 1) Cotton and Feed Grains (Monroe)
  - 2) Sweet Potato Producers Association (Mansura)
  - 3) Acadian Rice Producers Meeting (Crowley)
  - 4) North Louisiana Rice Producers Meeting (Rayville)
  - 5) North Louisiana General Commodity Meeting (Delhi)
  - 6) American Sugar Cane Growers and Technologists Meeting (Lafayette)
  - 7) Tri-Parish (Iberville, West Baton Rouge and Pointe Coupee Parishes) Growers Meeting (New Roads)
- The minimum sample size was established using Cochran's Sample Size determination formula. The calculations are:

$$n_o = \frac{t^2 s^2}{d^2} \quad \begin{array}{l} t^2 = 1.98 (.05 \text{ level}) \\ s^2 = \text{standard deviation of the estimate} \\ d^2 = \text{acceptable margin of error} \end{array}$$

$$\frac{(1.98)^2 (.7)}{(.15)^2}$$

$$\frac{3.9204 (.49)}{.0025} = \frac{1.92}{.0025}$$

$$n_o = 86$$

- By surveying crop producers at important commodity meetings, the researcher was able to make a personal appeal to the growers in a controlled setting. Based upon comments by the state specialists and extension agents, the researcher anticipated a response rate of 60% of those in attendance. The total number of usable responses received through these meetings was 176. This number exceeds the minimum sample size determined using Cochran's formula.

The second target population was Louisiana crop consultants. Crop consultants are recognized through a certification process administered through the Louisiana Department of Agriculture and Forestry (LDAF). The number of individuals certified is 187 according to the LDAF employee (M. Pousson, personal communication, October 6, 2010) who is responsible for issuing the licensure certificates.

The researcher contacted the executive director for the Louisiana Agricultural Consultants Association and requested a copy of the electronic mailing addresses for all its voting members. The list contained a total of 60 individuals and 59 unique email addresses.

## **Instrumentation**

With two distinct target populations identified, a survey instrument was designed for each population. One instrument was designed specifically for agronomic crop producers in Louisiana. This instrument was a researcher-designed questionnaire developed to accomplish the objectives of the study. Guidance in the formulation of this survey came from several different sources.

One source for the agronomic crop producers' survey was from reviewing studies that focused on similar objectives. Harms (2009) conducted a study of individuals engaged in agricultural enterprises in the state of Nebraska and was helpful in developing the instrument.

The second instrument was designed specifically for Louisiana crop consultants. This instrument was similar to the one administered to agronomic crop producers. Items specific to crop producers were removed from this instrument and replaced with questions related to the specific duties of crop consultants.

Both instruments were reviewed by a panel of experts consisting of crop producers and consultants. These reviewers were chosen prior to establishing the frame and were not members of the accessible population. AgCenter specialists with statewide responsibilities in specific agronomic crops also served as reviewers of the instrument. Additionally, the instrument was reviewed by university faculty with expertise in the area of survey instrument design. Based on the input of these individuals, needed adjustments to both instruments were incorporated.

## Data Collection

Data for this study were collected at several commodity meetings across the state and through the administering of an electronic survey. Based upon extensive discussions with AgCenter specialists with statewide agronomic crop responsibilities, AgCenter extension agents and commodity group leaders, seven meetings were identified and data were collected at each one.

The meetings at which data were collected were the following:

- 1) Acadian Rice Growers Association: This meeting was held January 6, 2011 in Crowley, Louisiana. Growers at this meeting were producers primarily of rice and soybeans.
- 2) Sweet Potato Growers Association Meeting: This meeting was held January 12, 2011 in Mansura, Louisiana. The main crop produced by the growers at this meeting was sweet potatoes.
- 3) North Louisiana Rice Producers Association: This meeting was held January 26, 2011 in Rayville, Louisiana. Growers at this meeting were producers primarily of rice, soybeans and corn.
- 4) Louisiana Sugarcane Producers and Sugarcane Technologists Annual Meeting: This meeting was held February 8, 2011, in Lafayette. Producers at this meeting were primarily sugarcane and soybean producers.
- 5) Cotton and Feed Grains Annual Meeting: This meeting was held January 28, 2011, in Monroe. Producers at this meeting represented growers primarily of cotton, soybeans, corn, grain sorghum and wheat.
- 6) North Louisiana General Commodity Meeting: This meeting was held January 18, 2011, in Delhi. Growers at this meeting were producers of rice, corn, cotton, soybeans, grain sorghum and wheat.
- 7) Tri-Parish Growers Meeting: This meeting was held January 31, 2011, in New Roads. Producers at this meeting were growers of sugarcane, corn, cotton, grain sorghum, soybeans, grain sorghum and wheat.

- At each meeting during the time allotted to the researcher, a short presentation was given to the audience explaining the purpose of the study. After the presentation, the researcher allowed the audience time for any comments or concerns related to the study.
- The survey instrument was distributed to those in attendance by the researcher with assistance provided by individuals associated with the meeting.
- The researcher asked those who had received an instrument to complete the instrument and return the completed instrument to designated collection points located throughout the room.
- To encourage participation, the researcher offered an incentive for those completing the survey. For individuals completing the survey and returning it, they were eligible for a drawing with two winners receiving a gift certificate to a national outdoor retail outlet provided by the researcher.
- The surveys were not numbered or coded when they were distributed at the commodity meeting to ensure anonymity. After the meeting, the researcher numbered the surveys prior to entering the data to help ensure accuracy during the data entry portion of the study.
- Because the number of respondents was lower than anticipated, the researcher sought out other commodity meetings to attend that would have a significant attendance. Because of limited number of commodity meetings left and conflicting dates, data were collected at one additional growers meeting. This meeting was held in White Castle on February 14, 2011 and was attended by primarily sugarcane and soybean growers.

- For the consultants, a survey instrument was sent electronically to the group during January 2011. This initial mailing included a cover page explaining the purpose of the study with link to the instrument. Approximately two weeks after the initial electronic mailing, a follow-up email was sent to the non-respondents. This second email also included a link to the instrument. One week later a third reminder was sent to the non-respondents informing them the survey would be closing in the next 48 hours and this would be their final opportunity to participate in the study.

### **Data Analysis**

Each objective as outlined in the study was evaluated using the following data analysis procedures:

1. To describe Louisiana agronomic crop producers on the following demographic characteristics:
  - i. Age;
  - j. Gender;
  - k. Race;
  - l. Agronomic crops produced and acres of each crop;
  - m. Percentage of income derived from agronomic crop production;
  - n. Size of farm in acres;
  - o. Years of farming agronomic crops; and
  - p. Education.

This objective examined interval, nominal and ordinal variables. Because they are descriptive in nature, the variables were analyzed using the appropriate descriptive statistic. For variables measured on a categorical scale (nominal and

ordinal), frequencies and percentages were reported. Categorical variables for this objective included: gender, race, agronomic crops produced, percentage of income from farming and highest level of education completed. For variables using a continuous scale of measurement (interval), means and standard deviations were reported. Variables using continuous measurements for this objective included: age, size of farm in acres, number of crops produced, acres produced of each crop and years of farming agronomic crops.

2. To determine the perceived usefulness of selected information sources when making decisions regarding operations related to their farm among agronomic crop producers in Louisiana.

This objective required multiple steps to analyze the data. The first step involved computing a mean and a standard deviation for each of the 10 information sources regarding their perceived usefulness. Therefore, a numerical score was assigned to each of the five response categories allowing a mean and standard deviation to be computed. A score of “one” was assigned to “Not at all useful,” “two” to “Somewhat useful,” “three” to “Moderately useful,” “four” to “Highly useful” and “five” to “Extremely useful.” After computing the mean for each source, this measure served as the perceived usefulness for each of the 10 information sources listed in the instrument as reported by agronomic crop producers. Each mean was reported along with standard deviation for the information sources. The researcher then provided an interpretive analysis of the scale. For a source with a mean score in the range of 4.50-5.00, the source was deemed to be “Extremely useful.” If a source had a mean score between 3.50-4.49, it was considered to be “Highly useful.” A mean score of 2.51-3.49 for a source was judged “Moderately useful.”



A source receiving a mean score between 1.51-2.50 was determined to be “Somewhat useful.” If a source had a mean of 1.0-1.5, it was deemed “Not at all useful.” The researcher applied this analysis to the overall usefulness score for the information sources.

3. To determine the frequency of use of selected information sources among agronomic crop producers in Louisiana with regard to information that is used in the production of agronomic crops.

A mean and standard deviation was computed for each of the information sources with regard to their frequency of usage as reported by the agronomic crop producers. A numerical score was assigned to each of the responses of the frequency scale to determine the mean and standard deviation for each of these information sources. A numerical score of “one” was given to the response “Never,” “two” to the response “Rarely,” “three” to the response “Sometimes,” “four” to the response “Often” and “five” to the response “Always.” The researcher again provided an interpretive analysis based upon the scale. For a source with a mean score in the range of 4.50-5.00, the source was given an “Always” rating. If a source had a mean score between 3.50-4.49, it was considered to be an “Often” used source. A mean score of 2.51-3.49 for a source indicated a “Sometimes” used source. A source receiving a mean score between 1.51-2.50 was determined to be a “Rarely” used source. If a source had a mean of 1.0-1.5, it was deemed to be a source that was “Never” used. The computed frequency score for each of the ten information sources was reported.

4. To determine the preferences for use of selected information sources among agronomic crop producers with regard to information used in the production of agronomic crops related to specific components of agronomic crop production.

A mean and standard deviation was computed for each of the items used in the preference scale as reported by crop producers regarding their preferences of use of the information sources regarding certain aspects (cultural practices, pest management issues, market issues and crop variety selection) of agronomic crop production. A numerical score was assigned to each of the responses of the preference scale to determine the mean and standard deviation for each of the information sources. A numerical score of “one” was given to the response “Not preferred,” “two” was given to the response “Slightly preferred,” “three” was given to the response “Moderately preferred,” “four” to the response “Highly preferred” and “five” to the response “Extremely preferred.” The researcher computed a cumulative mean score for each of the information sources based upon the combined mean scores of the information sources across the four components in the survey related to agronomic crop production. For example, an overall mean score were assigned to the information source “crop consultant” by computing the scores received by this source in each of the four components (cultural practices, pest management, market issues and crop variety selection). The researcher analyzed each information source using an interpretive scale based upon the response scale. If an information source received a cumulative mean score in the range of 4.50-5.00, the source was given an “Extremely Preferred” rating. If a source had a cumulative mean score between 3.50-4.49, it was considered to be a “Highly preferred” source. A cumulative mean score of 2.51-

3.49 for a source indicated a “Moderately preferred” source. A source that received a cumulative mean score between 1.51-2.50 was determined to be a “Slightly preferred” source. If a source had a cumulative mean of 1.0-1.5, it was deemed a source that was “Not at all preferred.”

5. To determine if a relationship exists between the perceived preferences for use of selected information sources of information as reported in objective 4 with regard to information used in the production of agronomic crops and the following selected demographic characteristics: age, number of crops farmed, education and acres farmed.

To accomplish this objective a Pearson Product Moment correlation coefficient measure was calculated between the perceived preference score for each information source and each of the following variables: age, number of crops farmed and acres farmed. For the variable education, an ordinal variable, a Kendall’s Tau correlation coefficient was calculated using the perceived preferences score of each information source as the other variable.

6. To determine the extent to which agronomic crop producers and crop consultants are aware of the information sources of the LSU AgCenter.

The first step in analyzing data for this objective involved computing a mean and the standard deviation for each of the six information sources offered by the AgCenter as reported by agronomic crop producers and crop consultants. The two groups were examined independently resulting in a set of scores representing the agronomic crop producers and a set of scores for the crop consultants. A numerical score was assigned to each of the responses of the awareness scale to determine the mean and standard deviation for each AgCenter information service. A score of “one” was assigned to “Not at all aware,” “two” to “Slightly

aware,” “three” to “Somewhat aware,” “four” to “Highly aware” and “five” to “Extremely aware.” The mean of all the items in the scale was computed to give an overall awareness of LSU AgCenter information sources as perceived by agronomic crop producers. A similar procedure was performed to give an overall awareness score for crop consultants. An interpretive scale based upon the response scale in the instrument was used to provide an analysis of each of the LSU AgCenter’s information sources as perceived by agronomic crop producers and crop consultants. For an information source with a mean score in the range of 4.50-5.00, the source was given an “Extremely aware” rating. If a service had a mean score between 3.50-4.49, it was considered to be “Highly aware.” A mean score of 2.51-3.49 resulted in a rating of “Somewhat aware.” A service that received a mean score between 1.51-2.50 was determined to be a “Slightly aware” source. If a service had a mean of 1.0-1.5, it was deemed to be “Not at all aware.”

7. To determine the frequency of use of crop production information distributed by the LSU AgCenter among agronomic crop producers and crop consultants in Louisiana as related to specific components of agronomic crop production.

A mean and standard deviation was computed for each of the items used in the frequency scale as reported by agronomic crop producers and crop consultants regarding their frequency of use of AgCenter information for specific aspects of agronomic crop production. A set of scores was derived from each of the two groups separately, and their responses were analyzed independently. A numerical score was assigned to each of the responses of the frequency scale to determine the mean and standard deviation for each of the different aspects of agronomic crop production. A numerical score of “one” was given to the response “Never,”

“two” to the response “Rarely,” “three” to the response “Sometimes,” “four” to the response “Often” and “five” to the response “Always.” The researcher calculated an overall score by computing the mean of all the items related to this objective to determine an overall AgCenter information usage score. The researcher then provided an interpretive analysis based upon the scale and the computed frequency score. For a source with a mean score in the range of 4.50-5.00, the source was given an “Always” rating. If a source had a mean score between 3.50-4.49, it was considered to be an “Often” used source. A mean score of 2.51-3.49 for a source indicated a “Sometimes” used source. A source that received a mean score between 1.51-2.50 was determined to be a “Rarely” used source. If a source had a mean score of 1.0-1.5, it was deemed to be a source that was “Never” used.

8. To determine the accuracy of information sources provided by the LSU AgCenter as perceived by agronomic crop producers and crop consultants in Louisiana.

A mean and standard deviation was computed for each of the items used in the accuracy scale as reported by agronomic crop producers and crop consultants regarding their perception of the accuracy of AgCenter information sources. Scores of agronomic crop producers and consultants were analyzed independently. A numerical score was assigned to each of the responses of the accuracy scale to determine the means and standard deviation for each of the AgCenter information sources. A numerical score of “one” was given to the response “Not at all accurate,” “two” to the response “Somewhat accurate,” “three” to the response “Moderately accurate,” “four” to the response “Highly accurate” and “five” to the response “Extremely accurate.”

The researcher calculated an overall score by computing the mean based on responses of all the items related to this objective to determine an overall AgCenter information accuracy score. The researcher then provided an interpretive analysis based upon the scale and the computed accuracy score for each of the AgCenter information sources. For a source with a mean score in the range of 4.50-5.00, the source was given an “Extremely accurate” rating. If a source had a mean score between 3.50-4.49, it was considered to be “Highly accurate” source. A mean score of 2.51-3.49 for a source indicated a “Moderately accurate” source. A source that received a mean score between 1.51-2.50 was determined to be a “Sometimes accurate” source. If a source had a mean of 1.0-1.5, it was deemed to be a source that is “Inaccurate.”

9. To determine the preferences for use of selected information sources among crop consultants with regard to information used in the production of agronomic crops related to specific components of agronomic crop production.

A mean and standard deviation was computed for each of the items used in the preference scale as reported by crop consultants regarding their preferences of use of the information sources regarding certain aspects of agronomic crop production. A numerical score was assigned to each of the responses of the frequency scale to determine the mean and standard deviation for each of information sources. A numerical score of “one” was given to the response “Not preferred,” “two” to the response “Slightly preferred,” “three” to the response “Moderately preferred,” “four” to the response “Highly preferred” and “five” to the response “Extremely preferred.” The researcher computed a mean for each of the information sources based upon the combined mean scores of the information

source across the four components in the survey related to agronomic crop production. For example, an overall mean score was assigned to the information source “agricultural salesperson/representatives” by computing the scores received by this source in each of the three components (cultural practices, pest management, and crop variety selection). The researcher also analyzed each information source using an interpretive scale based upon the response scale. If an information source received a cumulative mean score in the range of 4.50-5.00, the source was given an “Extremely preferred” rating. If a source had a cumulative mean score between 3.50-4.49, it was considered to be “Highly preferred” source. A cumulative mean score of 2.51-3.49 for a source indicated a “Moderately preferred” source. A source that received a cumulative mean score between 1.51-2.50 was determined to be a “Slightly preferred” source. If a source had a cumulative mean score between 1.0-1.5, it was deemed to be a source that was “Not at all preferred.”

10. To determine if a model exists explaining a significant portion of the variance in LSU AgCenter information usage among agronomic crop producers in Louisiana from the following measurements:

- a. Perceived awareness (as determined by summarizing an overall LSU AgCenter information awareness score on the items in the awareness scale in objective 7)
- b. Perceived accuracy (as determined by summarizing an overall mean score on the items related to accuracy of LSU AgCenter information sources in objective 8)
- c. Age
- d. Size of farm
- e. Number of agronomic crops produced

A multiple regression analysis was employed as the statistical technique to accomplish this objective. The overall AgCenter usage score summarizing the

perception of the usage of AgCenter sources regarding cultural practices, crop variety, pest management issues and market issues served as the dependent variable. The independent variables were entered as continuous variables and were the following: perceived awareness, perceived accuracy, age, size of farm and the number of agronomic crops. Because this study was exploratory, a stepwise multiple regression analysis entry was utilized. Independent variables that explain 1% or more of the variance were included in the model as long as the overall regression model remained significant.



## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

The primary purpose of this study was to determine the preferences of Louisiana agronomic crop producers and crop consultants in regard to acquiring information related to agricultural operations. Respondents were also asked their perceptions of selected LSU AgCenter information sources on the concepts of awareness, usage and accuracy.

Data were collected by the researcher at eight commodity meetings across the state. A total of 214 surveys were collected at the meetings. Thirty-eight surveys were omitted from the data analysis because they failed to meet the parameters set before the data collection. Therefore, a total 176 surveys were used in the data analysis. This number was lower than the researcher's estimate which was based on conversations with the individuals who were responsible for organizing the meetings.

Findings and analysis for the preferences of agronomic crop producers and crop consultants are presented in this chapter. Results are presented by research objective and include objectives one through ten.

#### **Objective One**

Objective one of the study was to describe Louisiana agronomic crop producers on the following demographic characteristics:

- q. Age;
- r. Gender;
- s. Race;
- t. Agronomic crops produced and acres of each crop;
- u. Percentage of income derived from agronomic crop production;
- v. Size of farm in acres;
- w. Years of farming agronomic crops;
- x. Education.

## Age

Of the 176 surveys analyzed, 173 respondents reported a specific age while 3 participants did not supply data for this measurement. The mean age for the respondents was 48.6 ( $SD=11.77$ ). The age of the respondents ranged from the youngest at 24 with the oldest being 80.

Respondents were then grouped into categories based upon their ages. The largest group was the “45-54 years old” category ( $n=55$ , 31.8%). The group with the second highest number of respondents was the “55-64 years old” category ( $n=42$ , 24.3%). The frequencies and percentages of the respondents based upon the categorical ages are presented in Table 1.

Table 1. Age of Louisiana Agronomic Crop Producers Based on Age Categories

Age Group	<i>n</i>	%
Under 25	3	1.7
25-34	22	12.7
35-44	36	20.8
45-54	55	31.8
55-64	42	24.3
65 or more	15	8.7
Total	173 <sup>a</sup>	100.0

Note:  $M=48.6$  years of age,  $SD=11.77$  and the range was from 24 years of age to 80 years of age.

<sup>a</sup>Data regarding age were not available for 3 respondents.

## Gender

The second demographic variable on which respondents were described was gender. A total of 173 respondents reported a specific gender while 3 participants did not supply data for this measurement. Males made up the majority of respondents ( $n=172$ , 99.4%). Only one respondent reported being female ( $n=1$ , 0.6%).

## Race

The third demographic variable on which the respondents were described was race. A total of 173 respondents reported a specific race while 3 participants did not supply data for this measurement. The majority of the respondents reported that they were Caucasian (99.4%,  $n=172$ ). One (0.6%) respondent reported being Hawaiian-Pacific Islander.

## Number of Agronomic Crops Produced and Acres of Each Crop

The next variable on which the respondents were described was the number of agronomic crops produced and the acres for each crop. Of the 176 surveys analyzed, 169 respondents reported growing specific agronomic crops. Seven individuals did not supply data for this measurement. The number of crops grown ranged from one to five crops grown.

The largest group was the category that reported growing “2” crops ( $n =64$ , 37.9%). The group with the second highest number of respondents was the category reporting “3” crops grown ( $n=42$ , 24.9%). The frequencies and percentages of the respondents based upon the numbers of crops produced are presented in Table 2.

Table 2. Number of Agronomic Crops Produced by Agronomic Crop Producers

Number of Crops Grown	<i>n</i>	%
1	32	18.9
2	64	37.9
3	42	24.9
4	20	11.8
5	11	6.5
Total	169 <sup>a</sup>	100.0

Note:  $M=2.49$ ,  $SD=1.12$  with the range a low of 1 crop grown and a high of 5 crops grown

<sup>a</sup>Data regarding the number of crops produced were not available for 7 respondents.

Eight agronomic crops were grown by the producers. These crops were corn, cotton, grain sorghum, rice, soybeans, sugarcane, sweet potatoes and wheat.

Of the 169 producers that reported growing specific agronomic crops, 71 producers (42.0%) reported growing corn. Acres ranged from a low of 10 acres to a high of 4,500 acres. Statistical data for corn producers are presented in Table 3.

For cotton, 38 respondents (22.5%) reported growing this crop. Acres ranged from a low of 85 acres to a high of 6,000 acres. Statistical data for cotton producers are presented in Table 3.

Thirteen respondents (7.7%) reported growing grain sorghum. Acres for this crop ranged from 50 acres to 8,000 acres. Statistical data for grain sorghum growers are presented in Table 3.

A total of 59 (34.9%) respondents reported growing rice. Acres ranged from a low of 70 acres to a high of 3,000 acres. Statistical data for rice producers are presented in Table 3.

Soybeans were the most common crop grown by the respondents. A total of 127 producers (75.1%) reported growing this crop. Acres ranged from a low of 90 acres to a high of 10,000 acres. Soybean producers' statistical data are presented in Table 3.

Sugarcane was grown by 38 (22.5%) respondents. Acres of sugarcane ranged from a low of 350 acres to a high of 4,500 acres. Statistical data for sugarcane producers are presented in Table 3.

Sweet potatoes were grown by 11 (6.5%) respondents. The range of acres for sweet potatoes was from a low of 75 acres to a high of 600 acres. Statistical data for sweet potato producers are presented in Table 3.

Wheat was grown by 54 (32.0%) of the respondents. Acres of wheat ranged from a low of 100 acres to a high of 2,400 acres. Statistical data for wheat producers are presented in Table 3.

Table 3. Statistical Data of Agronomic Crops Produced Based on Individual Crops

Crop Grown	<i>n</i>	Mean Acres	<i>SD</i>	Range	
				Low	High
Corn	71	996.9	912.76	10	4,500
Cotton	38	878.3	1164.51	85	6,000
Milo	13	936.9	2141.27	50	8,000
Rice	59	796.4	609.74	70	3,000
Soybeans	127	930.1	1320.79	90	10,000
Sugarcane	38	1842.7	1145.52	350	4,500
Sweet Potatoes	11	289.6	150.51	75	600
Wheat	54	499.8	402.73	100	2,400

### Percentage of Income Derived From Agronomic Crop Production

Respondents were also described by the percentage of income they derived from agronomic crop production. A total of 167 participants (94.9%) responded to this item. Nine individuals (5.1%) did not supply data for this measurement. The majority of agronomic crop producers ( $n=129$ , 77.2%) reported that they derived “76-100%” of their income from crop production. The next highest category ( $n=21$ , 22.8%) was the “51-75%” group. The frequencies and percentages of the respondents based upon the percentage of income derived from agronomic crop production are presented in Table 4.

Table 4. Percentage of Income Derived by Agronomic Crop Producers through Crop Production

Percentage of Income	<i>n</i>	%
1-25%	7	4.2
26-50%	10	6.0
51-75%	21	12.6
76-100%	129	77.2
Total	167 <sup>a</sup>	100.0

<sup>a</sup>Data regarding the percentage of income derived from agronomic crop production were not available for 9 respondents.

### Size of Farming Operation

The next variable examined looked at the total acres of the respondents farming operation including fallow ground. Of the 176 surveys analyzed, 163 respondents

(92.6%) reported the total acres of their farming operation. Thirteen individuals (7.4%) did not supply data for this measurement.

The mean total farm acreage for the respondents was 2,665.6 acres. ( $SD=3192.81$ ). The total acres of farming operations ranged from 200 acres to 26,000 acres.

Respondents were then grouped into categories based upon their total acres. The category which included the largest number of respondents was the “1000-1999 acres” category ( $n=44$ , 27.0%). The group with the second highest number of respondents was the “200-999 acres” category ( $n=39$ , 23.9%). The frequencies and percentages of the respondents based upon the category of total acres are presented in Table 5.

Table 5. Total Acreage of Farms as Reported by Agronomic Crop Producers

Size of Farm in Acres	<i>n</i>	%
200-999	39	23.9
1000-1999	44	27.0
2000-2999	32	19.6
3000-3999	18	11.0
4000-4999	11	6.8
5000 and greater	19	11.7
Total	163 <sup>a</sup>	100.0

Note:  $M=2,665.6$  acres,  $SD=3192.81$  with the range a low of 200 acres and a high of 26,000 acres.

<sup>a</sup>Data regarding the total acres of farming operations were not available for 13 respondents.

### **Years of Farming Agronomic Crops**

Respondents were then described on the number of years they had been engaged in agronomic crop production. Of the 176 surveys analyzed, 163 respondents (92.6%) reported a specific number of years of producing agronomic crops while 13 participants (7.4%) did not supply data for this measurement. The mean number of years that respondents had engaged in producing agronomic crops was 25.2 ( $SD=11.71$ ). The number of years of raising agronomic crops ranged from 2 to 56 years.

Respondents were then grouped into categories based upon their years producing agronomic crops. The largest group was the “More than 30 years” category ( $n=54$ , 33.1%). The group with the second highest number of respondents was the “26-30 years” category ( $n=27$ , 16.6%). The frequencies and percentages of the respondents based upon their years of farming agronomic crops are presented in Table 6.

Table 6. Number of Years Producing Agronomic Crops

Number of Years	<i>n</i>	%
5 or less	10	6.1
6-10	18	11.0
11-15	13	8.0
16-20	20	12.3
21-25	21	12.9
26-30	27	16.6
More than 30	54	33.1
Total	163 <sup>a</sup>	100.0

Note:  $M=25.2$ ,  $SD=11.71$  and the range was from 2 years of producing agronomic crops to a high of 56 years of raising agronomic crops

<sup>a</sup>Data regarding number of years producing agronomic crops were not available for 13 respondents.

### Highest Level of Education

Respondents were additionally described on the highest level of education that they had completed. Of the 176 surveys analyzed, 173 respondents (98.3%) reported a highest level of education completed while 3 participants (1.7%) did not supply data for this measurement.

Respondents were grouped into categories based upon highest level of education completed. The largest group was the “college degree” category ( $n=72$ , 41.6%). The group with the second highest number of respondents was the “high school graduate/GED” category ( $n=65$ , 37.6%). The smallest category was the “less than high school” group ( $n=2$ , 1.2%). The frequencies and percentages of the respondents based upon their highest level of education are presented in Table 7.

Table 7. Highest Level of Education Completed by Agronomic Crop Producers

Level of Education	<i>n</i>	%
Less than high school	2	1.2
High School/GED	65	37.6
Technical School/Some College	22	12.7
College Degree	72	41.6
Advanced Degree (Masters or Ph.D)	12	6.8
Total	173 <sup>a</sup>	100.0

<sup>a</sup>Data regarding highest level of education were not available for 3 respondents.

## Objective Two

The second objective was to determine the perceived usefulness of selected information sources when making decisions regarding operations related to their farm among agronomic crop producers in Louisiana. A total of 176 surveys were analyzed for this objective. The following anchored scale was used for this objective: “1=Not at all useful,” “2=Slightly useful,” “3=Moderately useful,” “4=Highly useful” and “5=Extremely useful.” A mean and standard deviation were computed for each of the 10 information sources. The researcher utilized an interpretive analysis of the scale for further examination. A source with a mean score in the range of 4.50-5.00 was deemed “Extremely useful.” If a source reported a mean score between 3.50-4.49, it was considered to be “Highly useful.” A mean score of 2.51-3.49 was judged to be “Moderately useful.” A source receiving a mean score between 1.51-2.50 was determined to be “Somewhat useful.” If a source had a mean of 1.0-1.5, it was deemed to be “Not at all useful.”

The source with the highest overall mean in relation to the perceived usefulness of selected information sources when making decisions regarding operations related to their farm among agronomic crop producers was the crop consultants group ( $M=4.11$ ,  $SD=.93$ ). The source with the lowest overall mean was the broadcast media (radio and



television) group ( $M=2.33$ ,  $SD=.96$ ). Data for the perceived usefulness of information sources are presented in Table 8.

Table 8. Statistical Data of the Perceived Usefulness of Selected Information Sources When Making Decisions Regarding Operations Related to their Farm among Agronomic Crop Producers in Louisiana

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
Crop Consultants <sup>a</sup>	173	4.11	.93	Highly useful
LSU AgCenter personnel <sup>b</sup>	174	3.97	.86	Highly useful
LSU AgCenter print materials <sup>c</sup>	172	3.82	.89	Highly useful
Agricultural salespersons/representatives <sup>d</sup>	173	3.73	.81	Highly useful
Other agronomic crop producers <sup>e</sup>	173	3.31	.89	Moderately useful
World Wide Web/Internet <sup>f</sup>	168	3.07	1.14	Moderately useful
Print publications/periodicals <sup>g</sup>	169	3.02	.96	Moderately useful
Financial advisors <sup>h</sup>	172	2.58	1.23	Moderately useful
Print mass media (newspapers) <sup>i</sup>	170	2.51	.99	Moderately useful
Broadcast media (radio and television) <sup>j</sup>	171	2.33	.96	Slightly useful

<sup>a</sup>Data were missing from 3 respondents for the crop consultants category

<sup>b</sup>Data were missing from 2 respondents for the LSU AgCenter personnel category

<sup>c</sup>Data were missing from 4 respondents for the LSU AgCenter print materials category

<sup>d</sup>Data were missing from 3 respondents for the agricultural salespersons/representatives category

<sup>e</sup>Data were missing from 3 respondents for the other agronomic crop producers category

<sup>f</sup>Data were missing from 8 respondents for the World Wide Web/Internet category

<sup>g</sup>Data were missing from 7 respondents for the print publications/periodicals category

<sup>h</sup>Data were missing from 4 respondents for the financial advisors category

<sup>i</sup>Data were missing from 6 respondents for the print mass media (newspapers) category

<sup>j</sup>Data were missing from 5 respondents for the broadcast media (radio and television) category

### Objective Three

The third objective was to determine the frequency of use of selected information sources among agronomic crop producers in Louisiana with regard to information that is used in the production of agronomic crops. A total of 176 surveys were analyzed for this objective. The following anchored scale was used for this objective: “1=Never,” “2=Rarely,” “3=Sometimes,” “4=Often” and “5=Always.” A mean and standard deviation were computed for each of the 10 information sources. The researcher utilized an interpretative analysis of the scale for further examination. A source with a mean score in the range of 4.50-5.00 was deemed “Always.” If a source reported a mean score

between 3.50-4.49, it was considered to be “Often.” A mean score of 2.51-3.49 was judged to be “Sometimes.” A source receiving a mean score between 1.51-2.50 was determined to be “Rarely.” If a source had a mean of 1.0-1.5, it was deemed to be “Never.”

The source with the highest overall mean in relation to the frequency of use of selected information sources among agronomic crop producers was the crop consultants group ( $M=4.00$ ,  $SD=1.08$ ). The source with the lowest overall mean was the broadcast media (radio and television) group ( $M=2.34$ ,  $SD=.97$ ). Data for the frequency of use of information sources are presented in Table 9.

Table 9. Statistical Data of the Frequency of Use of Selected Information Sources among Agronomic Crop Producers in Louisiana with Regard to Information that is Used in the Production of Agronomic Crops

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
Crop Consultants <sup>a</sup>	170	4.00	1.08	Often
Agricultural salespersons/representatives <sup>b</sup>	171	3.89	.80	Often
LSU AgCenter personnel <sup>c</sup>	173	3.68	.86	Often
LSU AgCenter print materials <sup>d</sup>	174	3.61	.88	Often
Other agronomic crop producers <sup>e</sup>	167	3.22	.89	Sometimes
Print publications/periodicals <sup>f</sup>	169	3.11	.94	Sometimes
World Wide Web/Internet <sup>g</sup>	169	3.05	1.13	Sometimes
Financial advisors <sup>h</sup>	172	2.72	1.16	Sometimes
Print mass media (newspapers) <sup>i</sup>	169	2.55	.99	Sometimes
Broadcast media (radio and television) <sup>j</sup>	166	2.34	.97	Rarely

<sup>a</sup>Data were missing from 6 respondents for the crop consultants category

<sup>b</sup>Data were missing from 5 respondents for the agricultural salespersons/representatives category

<sup>c</sup>Data were missing from 3 respondents for the LSU AgCenter personnel category

<sup>d</sup>Data were missing from 2 respondents for the LSU AgCenter print materials category

<sup>e</sup>Data were missing from 9 respondents for the other agronomic crop producers category

<sup>f</sup>Data were missing from 7 respondents for the print publications/periodicals category

<sup>g</sup>Data were missing from 7 respondents for the World Wide Web/Internet category

<sup>h</sup>Data were missing from 4 respondents for the financial advisors category

<sup>i</sup>Data were missing from 7 respondents for the print mass media (newspapers) category

<sup>j</sup>Data were missing from 10 respondents for the broadcast media (radio and television) category

## Objective Four

The fourth objective was to determine the preferences for use of selected information sources among agronomic crop producers with regard to information used in the production of agronomic crops related to specific components of agronomic crop production. The components were cultural practices, crop variety, pest management issues and market issues.

The respondents were asked their preferences for using 10 information sources for each of the four components related to agronomic crop production. A total of 176 surveys were analyzed for this objective. An anchored scale was used for this objective: “1=Not Preferred,” “2=Slightly preferred,” “3=Moderately preferred,” “4=Highly preferred” and “5=Extremely preferred.” Means and standard deviations were computed for each of the 10 information sources for each component.

For additional analysis, an interpretive scale was used to further study the overall means for each component. A source with a mean score in the range of 4.50-5.00 was given a “Extremely preferred” rating. If a source reported a mean score between 3.50-4.49, it was considered to be “Highly preferred.” A mean score of 2.51-3.49 was judged to be “Moderately preferred.” A source receiving a mean score between 1.51-2.50 was determined to be “Slightly preferred.” If a source had a mean of 1.0-1.5, it was deemed to be “Not preferred.”

For the component of cultural practices (seeding rates, fertilization, field preparation, etc.), the source with the highest mean was the crop consultants group ( $M=4.00$ ,  $SD=1.08$ ). The broadcast media group (radio and television) was the source with the lowest mean for cultural practices ( $M=2.11$ ,  $SD=1.01$ ). Data for the preferences of use of information sources are presented in Table 10.

Table 10. Statistical Data of the Preferences for Use of Selected Information Sources among Agronomic Crop Producers in Louisiana with Regard to Information Used in the Production of Agronomic Crops as Related to the Component Cultural Practices

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
Crop Consultants <sup>a</sup>	163	4.00	1.08	Highly preferred
LSU AgCenter personnel <sup>b</sup>	169	3.89	.93	Highly preferred
LSU AgCenter print material <sup>c</sup>	168	3.84	.86	Highly preferred
Agricultural salespersons/representatives <sup>d</sup>	169	3.61	.91	Highly preferred
Other agronomic crop producers <sup>e</sup>	170	3.43	.92	Moderately preferred
World Wide Web/Internet <sup>f</sup>	168	2.88	1.16	Moderately preferred
Print publications/periodicals <sup>g</sup>	167	2.85	.94	Moderately preferred
Print mass media (newspapers) <sup>h</sup>	167	2.35	1.01	Slightly preferred
Financial advisors <sup>i</sup>	166	2.30	1.19	Slightly preferred
Broadcast media (radio and television) <sup>j</sup>	169	2.11	1.01	Slightly preferred

<sup>a</sup>Data were missing from 13 respondents for the crop consultants category

<sup>b</sup>Data were missing from 7 respondents for the LSU AgCenter personnel category

<sup>c</sup>Data were missing from 8 respondents for the LSU AgCenter print materials category

<sup>d</sup>Data were missing from 7 respondents for the agricultural salespersons/representatives category

<sup>e</sup>Data were missing from 6 respondents for the other agronomic crop producers category

<sup>f</sup>Data were missing from 8 respondents for the World Wide Web/Internet category

<sup>g</sup>Data were missing from 9 respondents for the print publications/periodicals category

<sup>h</sup>Data were missing from 9 respondents for the print mass media (newspapers) category

<sup>i</sup>Data were missing from 10 respondents for the financial advisors category

<sup>j</sup>Data were missing from 7 respondents for the broadcast media (radio and television) category

The next preference for use component in which respondents were measured was crop variety. Means and standard deviations were computed for the 10 information sources, and an interpretive analysis was conducted. The source with the highest mean for crop variety was the crop consultants category ( $M=4.04$ ,  $SD=1.04$ ). The source with the lowest mean score was the broadcast media category ( $M=2.10$ ,  $SD=1.03$ ). Data for the crop variety component are presented in Table 11.

Table 11. Statistical Data of the Preferences for Use of Selected Information Sources among Agronomic Crop Producers in Louisiana with Regard to Information Used in the Production of Agronomic Crops as Related to the Component Crop Variety

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
Crop Consultants <sup>a</sup>	164	4.04	1.04	Highly preferred
LSU AgCenter personnel <sup>b</sup>	170	3.99	.94	Highly preferred
LSU AgCenter print material <sup>c</sup>	164	3.98	.94	Highly preferred
Agricultural salespersons/representatives <sup>d</sup>	170	3.60	1.02	Highly preferred
Other agronomic crop producers <sup>e</sup>	168	3.48	.97	Moderately preferred
World Wide Web/Internet <sup>f</sup>	166	2.80	1.22	Moderately preferred

(Table continued)

Print publications/periodicals <sup>g</sup>	166	2.77	1.01	Moderately preferred
Print mass media (newspapers) <sup>h</sup>	163	2.30	1.04	Slightly preferred
Financial advisors <sup>i</sup>	166	2.16	1.19	Slightly preferred
Broadcast media (radio and television) <sup>j</sup>	169	2.10	1.03	Slightly preferred

<sup>a</sup>Data were missing from 12 respondents for the crop consultants category

<sup>b</sup>Data were missing from 6 respondents for the LSU AgCenter personnel category

<sup>c</sup>Data were missing from 12 respondents for the LSU AgCenter print materials category

<sup>d</sup>Data were missing from 6 respondents for the agricultural salespersons/representatives category

<sup>e</sup>Data were missing from 8 respondents for the other agronomic crop producers category

<sup>f</sup>Data were missing from 10 respondents for the World Wide Web/Internet category

<sup>g</sup>Data were missing from 10 respondents for the print publications/periodicals category

<sup>h</sup>Data were missing from 13 respondents for the print mass media (newspapers) category

<sup>i</sup>Data were missing from 10 respondents for the financial advisors category

<sup>j</sup>Data were missing from 7 respondents for the broadcast media (radio and television) category

Participants were then asked to rate their preferences for use of selected information sources for the component pest management issues. Means and standard deviations were computed for the 10 information sources, and an interpretive analysis was utilized. The source with the highest mean for pest management issues was the crop consultants category ( $M=4.24$ ,  $SD=1.02$ ). The source with the lowest mean score was the financial advisers category ( $M=2.07$ ,  $SD=1.22$ ). Data for the pest management component are presented in Table 12.

Table 12. Statistical Data of the Preferences for Use of Selected Information Sources among Agronomic Crop Producers in Louisiana with Regard to Information Used in the Production of Agronomic Crops as Related to the Component Pest Management Issues

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
Crop Consultants <sup>a</sup>	165	4.24	1.02	Highly preferred
LSU AgCenter personnel <sup>b</sup>	168	3.98	.95	Highly preferred
LSU AgCenter print material <sup>c</sup>	166	3.92	.98	Highly preferred
Agricultural salespersons/representatives <sup>d</sup>	169	3.73	.97	Highly preferred
Other agronomic crop producers <sup>e</sup>	167	3.41	1.17	Moderately preferred
World Wide Web/Internet <sup>f</sup>	167	2.86	1.28	Moderately preferred
Print publications/periodicals <sup>g</sup>	167	2.73	1.18	Moderately preferred
Print mass media (newspapers) <sup>h</sup>	167	2.22	1.17	Slightly preferred
Broadcast media (radio and television) <sup>i</sup>	166	2.16	1.19	Slightly preferred
Financial Advisors <sup>j</sup>	167	2.07	1.23	Slightly preferred

<sup>a</sup>Data were missing from 11 respondents for the crop consultants category

<sup>b</sup>Data were missing from 8 respondents for the LSU AgCenter personnel category

<sup>c</sup>Data were missing from 10 respondents for the LSU AgCenter print materials category

<sup>d</sup>Data were missing from 7 respondents for the agricultural salespersons/representatives category

<sup>e</sup>Data were missing from 9 respondents for the other agronomic crop producers category

(Table continued)

<sup>f</sup>Data were missing from 9 respondents for the World Wide Web/Internet category

<sup>g</sup>Data were missing from 9 respondents for the print publications/periodicals category

<sup>h</sup>Data were missing from 9 respondents for the print mass media (newspapers) category

<sup>i</sup>Data were missing from 10 respondents for the broadcast media (radio and television) category

<sup>j</sup>Data were missing from 7 respondents for the financial advisors category

Market issues was the final component that respondents were asked regarding their preference for use of information sources. Means and standard deviations were computed for the 10 information sources, and an interpretive analysis was conducted. The source with the highest mean for market issues was the World Wide Web/Internet ( $M=3.24$ ,  $SD=1.32$ ). The source with the lowest mean score was the broadcast media category ( $M=2.51$ ,  $SD=1.18$ ). Data for the market issues component are presented in Table 13.

Table 13. Statistical Data of the Preferences for Use of Selected Information Sources among Agronomic Crop Producers in Louisiana with Regard to Information Used in the Production of Agronomic Crops as Related to the Component Market Issues

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
World Wide Web/Internet <sup>a</sup>	164	3.24	1.32	Moderately preferred
Financial Advisors <sup>b</sup>	167	3.22	1.28	Moderately preferred
Other agronomic crop producers <sup>c</sup>	163	3.07	1.10	Moderately preferred
LSU AgCenter personnel <sup>d</sup>	166	3.04	1.17	Moderately preferred
LSU AgCenter print material <sup>e</sup>	167	2.98	1.13	Moderately preferred
Print publications/periodicals <sup>f</sup>	166	2.88	1.14	Moderately preferred
Crop Consultants <sup>g</sup>	160	2.84	1.28	Moderately preferred
Agricultural salespersons/representatives <sup>h</sup>	165	2.73	1.32	Moderately preferred
Print mass media (newspapers) <sup>i</sup>	164	2.63	1.18	Moderately preferred
Broadcast media (radio and television) <sup>j</sup>	164	2.51	1.18	Moderately preferred

<sup>a</sup>Data were missing from 12 respondents for the World Wide Web/Internet category

<sup>b</sup>Data were missing from 9 respondents for the financial advisors category

<sup>c</sup>Data were missing from 11 respondents for the other agronomic crop producers category

<sup>d</sup>Data were missing from 10 respondents for the LSU AgCenter personnel category

<sup>e</sup>Data were missing from 9 respondents for the LSU AgCenter print materials category

<sup>f</sup>Data were missing from 10 respondents for the print publications/periodicals category

<sup>g</sup>Data were missing from 16 respondents for the crop consultants category

<sup>h</sup>Data were missing from 11 respondents for the agricultural salespersons/representatives category

<sup>i</sup>Data were missing from 12 respondents for the print mass media (newspapers)category

<sup>j</sup>Data were missing from 12 respondents for the broadcast media (radio and television) category

A cumulative mean score was calculated for each of the 10 information sources by computing their scores from each of the four components (cultural practices, crop variety, pest

management and market issues) related to agronomic crop production. The interpretive scale was then applied to each source to determine their overall preference of use. The source with the highest overall mean score was the crop consultants group ( $M=3.78$ ,  $SD=.92$ ). The group with the lowest overall mean was the broadcast media (radio and television) category ( $M=2.21$ ,  $SD=.97$ ). Data for the overall preference of use are presented in Table 14.

Table 14. Statistical Data for the Overall Preferences for Use of Information Sources Among Agronomic Crop Producers in Louisiana with Regard to Information Used in the Production of Agronomic Crops as Related to All Specific Components

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
Crop Consultants	172	3.78	.92	Highly preferred
LSU AgCenter personnel	171	3.73	.85	Highly preferred
LSU AgCenter print material	171	3.69	.81	Highly preferred
Agricultural salespersons/representatives	172	3.42	.86	Moderately preferred
Other agronomic crop producers	172	3.36	.83	Moderately preferred
World Wide Web/Internet	170	2.93	1.13	Moderately preferred
Print publications/periodicals	170	2.80	.93	Moderately preferred
Financial Advisors	171	2.45	1.08	Slightly preferred
Print mass media (newspapers)	170	2.38	1.00	Slightly preferred
Broadcast media (radio and television)	171	2.21	.97	Slightly preferred

### Objective Five

The fifth objective was to determine if a relationship exists between the perceived preferences for use of selected sources of information as reported in objective 4 with regard to information used in the production of agronomic crops and the following demographic characteristics: age, number of crops farmed, education and acres farmed.

For the interval variables age, number of crops farmed and acres farmed, a Pearson Product Moment correlation coefficient measure was calculated. The correlation was calculated using the cumulative mean of the overall preference score for each of the 10 information sources. Davis descriptors (1971) were used to interpret the magnitude of the effect size. The scale is listed below:

- .01-.09 is considered a negligible association

- .10-.29 is a low association
- .30-.49 is a moderate association
- .50-.69 is a substantial association
- .70 or greater is a very strong association

When computing the Pearson Product Moment correlation for the 10 information sources and the variable age, 5 of the correlations were found to be significant. All of the significant correlations showed a low negative association. The Pearson Product Moment correlation with the strongest association with the variable age was the information source agricultural salespersons/representatives ( $r=-.21$ ,  $p<.004$ ). This relationship indicated that as age increased, respondents were less likely to prefer to receive information from agricultural salespersons/representatives. The correlation results are found in Table 15.

Table 15. Pearson Product Moment Correlation between the Information Sources and the Variable Age

Information Source	<i>n</i>	<i>r</i>	<i>p</i>
Agricultural salespersons/representatives	175	-.21	.004
Broadcast media (radio and television)	174	-.15	.043
Crop Consultants	175	-.20	.008
Financial Advisors	174	-.11	.113
AgCenter personnel	174	.09	.235
AgCenter print material	174	.11	.144
Other agronomic crop producers	175	-.10	.189
Print mass media (newspapers)	173	-.16	.042
Print publications/periodicals	173	-.09	.248
World Wide Web/Internet	173	-.18	.016

Note: Interpretation Scale (Davis, 1971): .01-.09=negligible, .10-.29=low, .30-.49=moderate, .50-.69=substantial, .70 or greater=very strong.

A Pearson Product Moment correlation for the 10 information sources and the variable number of crops was performed. Two of the correlations, LSU AgCenter personnel and LSU AgCenter print materials, were found to be significant. Both of the correlations showed a low negative association. The Pearson Product Moment correlation



with the strongest association with the variable number of crops was the information source LSU AgCenter personnel ( $r=-.23$ ,  $p<.003$ ). This relationship indicated that as the number of crops increased, respondents were less likely to prefer to receive information from LSU AgCenter personnel. The correlation results are found in Table 16.

Table 16. Pearson Product Moment Correlation Between the Information Sources and the Variable Number of Crops Produced

Information Source	<i>n</i>	<i>r</i>	<i>p</i>
Agricultural salespersons/representatives	171	-.08	.319
Broadcast media (radio and television)	170	-.13	.084
Crop Consultants	171	.06	.477
Financial Advisors	170	-.05	.488
AgCenter personnel	170	-.23	.003
AgCenter print material	170	-.19	.012
Other agronomic crop producers	171	-.13	.092
Print mass media (newspapers)	169	-.06	.499
Print publications/periodicals	169	-.14	.071
World Wide Web/Internet	169	.01	.884

Note: Interpretation Scale (Davis, 1971): .01-.09=negligible, .10-.29=low, .30-.49=moderate, .50-.69=substantial, .70 or greater=very strong.

For the variable education, a Kendall's tau correlation was conducted on the 10 information sources. Four of the correlations, broadcast media, crop consultants, financial advisors and print mass media, were found to be significant. All of the significant correlations showed a low negative association. The Kendall's tau correlation with the strongest association with the variable education was the information source broadcast media ( $r=-.20$ ,  $p<.001$ ) and print mass media ( $r=-.20$ ,  $p<.001$ ). This relationship indicated that as the producers' education increased, the producers were less likely to prefer to receive information from the broadcast media and print media sources. The correlation results are found in Table 17.

Table 17. Kendall's tau Correlation Between the Information Sources and the Variable Education

Information Source	<i>n</i>	<i>r</i>	<i>p</i>
Agricultural salespersons/representatives	175	-.07	.260
Broadcast media (radio and television)	174	-.20	.001

(Table continued)

Crop Consultants	175	-.12	.038
Financial Advisors	174	-.17	.005
AgCenter personnel	174	.02	.686
AgCenter print material	174	-.02	.711
Other agronomic crop producers	175	-.07	.247
Print mass media (newspapers)	173	-.20	.001
Print publications/periodicals	173	-.06	.286
World Wide Web/Internet	173	.03	.637

The final correlation executed on the 10 information sources involved the variable total acres farmed. For this test, a Pearson Product Moment correlation was performed.

None of the correlations were found to be significant. The Pearson Product Moment correlation with the strongest association with the number of acres farmed were the information sources broadcast media ( $r=-.15$ ,  $p<.063$ ), other agronomic producers ( $r=-.15$ ,  $p<.062$ ) and print mass media ( $r=-.15$ ,  $p<.060$ ). This relationship indicated that as the number of acres increased, respondents were less likely to prefer to receive information from broadcast media, other producers and print mass media. The correlation results are found in Table 18.

Table 18. Pearson Product Moment Correlation Between the Information Sources and the Variable Acres Farmed

Information Source	<i>n</i>	<i>r</i>	<i>p</i>
Agricultural salespersons/representatives	165	.02	.844
Broadcast media (radio and television)	164	-.15	.063
Crop Consultants	165	.12	.114
Financial Advisors	164	.01	.876
AgCenter personnel	164	-.10	.205
AgCenter print material	164	-.08	.280
Other agronomic crop producers	165	-.15	.062
Print mass media (newspapers)	163	-.15	.060
Print publications/periodicals	163	-.08	.317
World Wide Web/Internet	163	-.01	.962

Note: Interpretation Scale (Davis, 1971): .01-.09=negligible, .10-.29=low, .30-.49=moderate, .50-.69=substantial, .70 or greater=very strong.

## Objective Six

### Awareness of LSU AgCenter Information Sources by Agronomic Crop Producers

The sixth objective of the study was to determine the extent to which agronomic crop producers and crop consultants are aware of information sources of the LSU AgCenter. A total of 176 surveys from agronomic crop producers were analyzed for this objective. The following anchored scale was used for this objective: “1=Not at all aware,” “2=Slightly aware,” “3=Somewhat aware,” “4=Highly aware” and “5=Extremely aware.” A mean and standard deviation were computed for each of the six information sources. An interpretive analysis of the scale for further examination was conducted. A source with a mean score in the range of 4.50-5.00 was deemed “Extremely aware.” If a source reported a mean score between 3.50-4.49, it was considered to be “Highly aware.” A mean score of 2.51-3.49 was judged to be “Somewhat aware.” A source receiving a mean score between 1.51-2.50 was determined to be “Slightly aware.” If a source had a mean of 1.0-1.5, it was deemed to be “Not at all aware.”

The source with the highest mean in relation to the awareness of LSU AgCenter information sources among agronomic crop producers was the parish extension office/extension agents group ( $M=4.16$ ,  $SD=.82$ ). The source with the lowest mean was the LSU AgCenter radio and television segments ( $M=2.97$ ,  $SD=1.27$ ). Data for the awareness of LSU AgCenter information sources among agronomic crop producers are presented in Table 19.

Table 19. Statistical Data of the Awareness of Agronomic Crop Producers in Louisiana with Regard to Information Services Provided by the LSU AgCenter

Information Service	<i>n</i>	Mean	<i>SD</i>	Interpretation
Parish extension office/extension agent <sup>a</sup>	174	4.16	1.08	Highly aware
AgCenter newsletters/publications (elec. or print) <sup>b</sup>	175	3.98	.93	Highly aware
Area research station personnel <sup>c</sup>	173	3.96	.93	Highly aware

(Table continued)

Research publications (magazines, facts sheets) <sup>d</sup>	174	3.92	.84	Highly aware
AgCenter website (lsuagcenter.com) <sup>e</sup>	174	3.68	1.06	Highly aware
AgCenter radio and television segments <sup>f</sup>	173	2.97	1.27	Somewhat aware

<sup>a</sup>Data were missing from 2 respondents for the parish extension office/extension agent category

<sup>b</sup>Data were missing from 1 respondent for the newsletters/publications category

<sup>c</sup>Data were missing from 3 respondents for the area research personnel category

<sup>d</sup>Data were missing from 2 respondents for the research publications category

<sup>e</sup>Data were missing from 2 respondents for the website (lsuagcenter.com) category

<sup>f</sup>Data were missing from 3 respondents for the radio and television segments category

An overall awareness score for the six information sources was determined by using the mean of all the items in the scale. The overall awareness score mean was 3.78 ( $M=3.78, SD=.75$ ). Using the interpretive scale the overall awareness of the LSU AgCenter information sources was deemed to be “Highly aware.”

#### **Awareness of LSU AgCenter Information Sources by Crop Consultants**

In analyzing the crop consultants’ data, a total of 32 surveys were analyzed. The same anchored and interpretive scales were used for this objective. The service with the highest mean in relation to the awareness of LSU AgCenter information sources among crop consultants was the LSU AgCenter website. ( $M=4.56, SD=.67$ ). The source with the lowest mean was the LSU AgCenter radio and television segments ( $M=2.41, SD=1.27$ ). Data for the awareness of LSU AgCenter information sources among crop consultants are presented in Table 20.

Table 20. Statistical Data of the Awareness of Crop Consultants in Louisiana with Regard to Information Sources Provided by the LSU AgCenter

Information Service	<i>n</i>	Mean	<i>SD</i>	Interpretation
AgCenter website (lsuagcenter.com)	32	4.56	.67	Extremely aware
Area research station personnel	32	4.31	.86	Highly aware
Research publications (magazines, facts sheets)	32	4.31	.87	Highly aware
AgCenter newsletters/publications (elec. or print)	32	4.16	.92	Highly aware
Parish extension office/extension agents	32	4.03	1.06	Highly aware
AgCenter radio and television segments	32	2.41	1.27	Slightly aware

The overall awareness score for the LSU AgCenter information sources was determined by using mean of all the items in the scale. The overall awareness mean among crop consultants was 3.96 ( $M=3.96$ ,  $SD=.76$ ). Using the interpretative scale the overall awareness of the LSU AgCenter information sources was also deemed to be “Highly aware.”

### **Objective Seven**

#### **Frequency of Use of LSU AgCenter Information Services by Agronomic Crop Producers with Regard to Specific Components of Agronomic Crop Production**

The seventh objective of the study was to determine the frequency of use of crop production information distributed by the LSU AgCenter among both agronomic crop producers and crop consultants with regard to four specific components of agronomic crop production: cultural practices, crop variety selection, pest management issues and market issues. A total of 176 surveys from agronomic crop producers were analyzed for this objective. The following anchored scale was used for this objective: “1=Never,” “2=Rarely,” “3=Sometimes,” “4=Often” and “5=Always.” A mean and standard deviation were computed for each of the four components. An interpretive analysis of the scale for further examination was carried out. A component with a mean score in the range of 4.50-5.00, deemed LSU AgCenter information was used “Always.” If a component reported a mean score between 3.50-4.49, it was considered that LSU AgCenter information was used “Often.” A mean score of 2.51-3.49 meant that LSU AgCenter information related to this component was used “Sometimes.” A component receiving a mean score between 1.51-2.50 indicated that LSU AgCenter information was used “Rarely.” If a component had a mean of 1.0-1.5, LSU AgCenter information was “Never” used.

The component with the highest mean in relation to the frequency of use of crop information distributed by LSU AgCenter information services among agronomic crop producers was crop variety selection ( $M=4.20$ ,  $SD=.86$ ). The component with the lowest mean was the market issues component ( $M=3.10$ ,  $SD=1.12$ ). Data for the frequency of use of crop production information distributed by the LSU AgCenter among both agronomic crop producers as related to specific components of agronomic crop production are presented in Table 21.

Table 21. Statistical Data of the Frequency of Use of Crop Production Information Distributed by the LSU AgCenter among Agronomic Crop Producers with Regard to Specific Components of Agronomic Crop Production

Agronomic Crop Component	<i>n</i>	Mean	<i>SD</i>	Interpretation
Crop variety selection <sup>a</sup>	172	4.20	.86	Often
Pest management issues <sup>b</sup>	173	4.17	.78	Often
Cultural practices <sup>c</sup>	173	4.10	.73	Often
Market Issues <sup>d</sup>	170	3.10	1.12	Sometimes

<sup>a</sup>Data were missing from 4 respondents for the crop variety category

<sup>b</sup>Data were missing from 3 respondents for the pest management issues category

<sup>c</sup>Data were missing from 3 respondents for the cultural practices category

<sup>d</sup>Data were missing from 6 respondents for the market issues category

### **Frequency of Use of LSU AgCenter Information Services by Crop Consultants with Regard to Specific Components of Agronomic Crop Production**

In analyzing the crop consultants' data, a total of 32 surveys were analyzed. The same anchored and interpretive scales for agronomic crop producers were used for the crop consultants' data. The component with the highest mean in relation to the frequency of use of crop information distributed by the LSU AgCenter among crop consultants regarding specific components of agronomic crop production was pest management issues ( $M=4.19$ ,  $SD=.82$ ). The source with the lowest mean was market issues ( $M=2.31$ ,  $SD=1.12$ ). Data for the frequency of use of crop production information distributed by the LSU AgCenter among crop consultants as related to specific components of agronomic crop production are presented in Table 22.

Table 22. Statistical Data of the Frequency of Use of Crop Production Information Distributed by the LSU AgCenter among Crop Consultants with Regard to Specific Components of Agronomic Crop Production

Agronomic Crop Component	<i>n</i>	Mean	<i>SD</i>	Interpretation
Pest management issues	32	4.19	.82	Often
Crop variety selection	32	3.88	.87	Often
Cultural practices	32	3.75	.98	Often
Market Issues	32	2.31	1.12	Rarely

## Objective Eight

### Accuracy of LSU AgCenter Information Sources by Agronomic Crop Producers

Objective eight was to determine the accuracy of information sources provided by the LSU AgCenter as perceived by both agronomic crop producers and crop consultants in Louisiana. Agronomic crop producers and crop consultants' data were analyzed independently.

A total of 176 surveys from agronomic crop producers were analyzed for this objective. The following anchored scale was used for this objective: "1=Not at all accurate," "2=Somewhat accurate," "3=Moderately accurate," "4=Highly accurate" and "5=Extremely accurate." A mean and standard deviation were computed for each of the six information sources. An interpretive analysis of the scale for further examination was conducted. A source with a mean score in the range of 4.50-5.00 was given an "Extremely accurate" rating. If a source had a mean score between 3.50-4.49, it was considered to be "Highly accurate." A mean score of 2.51-3.49 was judged to be "Moderately accurate." A source receiving a mean score between 1.51-2.50 was deemed to be "Somewhat accurate." If a source had a mean of 1.0-1.5, it was deemed to be "Not at all accurate."

The source with the highest mean in relation to accuracy of LSU AgCenter information sources among agronomic crop producers was area research station

personnel ( $M=4.10$ ,  $SD=.73$ ). The source with the lowest mean in terms of accuracy was the LSU AgCenter radio and television segments ( $M=3.67$ ,  $SD=.85$ ). Data for the accuracy of LSU AgCenter information services among agronomic crop producers are presented in Table 23.

Table 23. Statistical Data of the Accuracy of Agronomic Crop Producers in Louisiana with Regard to Information Sources of the LSU AgCenter

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
Area research station personnel <sup>a</sup>	170	4.10	.72	Highly accurate
Research publications (magazines, facts sheets) <sup>b</sup>	171	4.06	.65	Highly accurate
AgCenter newsletters/publications (elec. or print) <sup>c</sup>	171	4.03	.72	Highly accurate
Parish extension office/extension agents <sup>d</sup>	171	4.01	.73	Highly accurate
AgCenter website (lsuagcenter.com) <sup>e</sup>	163	3.94	.80	Highly accurate
AgCenter radio and television segments <sup>f</sup>	162	3.67	.85	Highly accurate

<sup>a</sup>Data were missing from 6 respondents for the area research personnel category

<sup>b</sup>Data were missing from 5 respondent for the research publications category

<sup>c</sup>Data were missing from 5 respondents for the newsletters/publications category

<sup>d</sup>Data were missing from 5 respondents for the parish extension office/extension agent category

<sup>e</sup>Data were missing from 13 respondents for the website (lsuagcenter.com) category

<sup>f</sup>Data were missing from 14 respondents for the radio and television segments category

The overall accuracy score for the LSU AgCenter information sources was determined by using the mean of all the items in the scale. The overall mean accuracy score among agronomic crop producers was 3.98 ( $M=3.98$ ,  $SD=.60$ ). Using the interpretative scale, the overall accuracy of the LSU AgCenter information sources was deemed to be “Highly accurate.”

### **Accuracy of LSU AgCenter Information Sources by Crop Consultants**

Thirty-two surveys from crop consultants were analyzed for this objective. The same anchored and interpretive scales were used for examining the data.

The information source with the highest mean in relation to the accuracy of LSU AgCenter information sources among crop consultants was area research station personnel ( $M=4.22$ ,  $SD=.79$ ). The source with the lowest mean was the LSU AgCenter



radio and television segments ( $M=2.88$ ,  $SD=1.31$ ). Data for the accuracy of LSU AgCenter information sources among crop consultants are presented in Table 24.

Table 24. Statistical Data of the Accuracy of among Crop Consultants in Louisiana with Regard to Information Sources of the LSU AgCenter

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
Area research station personnel	32	4.22	.79	Highly accurate
Research publications (magazines, facts sheets)	32	3.97	.78	Highly accurate
AgCenter website (lsuagcenter.com)	32	3.84	.81	Highly accurate
AgCenter newsletters/publications (elec. or print)	32	3.78	.91	Highly accurate
Parish extension office/extension agents	32	3.19	.73	Moderately accurate
AgCenter radio and television segments	32	2.88	1.31	Moderately accurate

The overall accuracy score for the LSU AgCenter information sources was determined by using the mean of all the items in the scale. The overall accuracy mean score among crop consultants was 3.65 ( $M=3.65$ ,  $SD=.80$ ). Using the interpretive scale, the overall accuracy of the LSU AgCenter information sources was deemed to be “Highly accurate.”

### **Objective Nine**

The ninth objective was to determine the preferences of use of selected information sources among crop consultants with regard to information use in the production of agronomic crops.

The respondents were asked the preferences for using 10 information sources for receiving information regarding agronomic crop production in three primary areas: cultural practices, crop variety selection and pest management issues. A total of 32 surveys were analyzed for this objective. An anchored scale was used for this objective: “1=Not Preferred,” “2=Slightly preferred,” “3=Moderately preferred,” “4=Highly preferred” and “5=Extremely preferred.” Means and standard deviations were computed for each of the 10 information sources for each of the three components.

For further analysis, an interpretive scale was used to study the means for each component. A source with a mean score in the range of 4.50-5.00 was given a “Extremely preferred” rating. If a source reported a mean score between 3.50-4.49, it was considered to be “Highly preferred.” A mean score of 2.51-3.49 was judged to be “Moderately preferred.” A source receiving a mean score between 1.51-2.50 was determined to be “Slightly preferred.” If a source had a mean of 1.0-1.5, it was deemed to be “Not preferred.”

For the component of cultural practices (seeding rates, fertilization, field preparation, etc.), the sources with the highest overall mean were LSU AgCenter personnel ( $M=3.81$ ,  $SD=1.03$ ), LSU AgCenter print materials ( $M=3.81$ ,  $SD=1.09$ ) and other crop consultants ( $M=3.81$ ,  $SD=.86$ ). The source, financial advisors, ( $M=1.38$ ,  $SD=.71$ ) was the source with the lowest mean for cultural practices. Data for the preferences of use of information sources for cultural practices by crop consultants are presented in Table 25.

Table 25. Statistical Data of the Preferences for Use of Selected Delivery Methods among Crop Consultants in Louisiana with Regard to Information Used in the Production of Agronomic Crops as Related to the Component Cultural Practices

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
LSU AgCenter personnel	32	3.81	1.03	Highly preferred
LSU AgCenter print material	32	3.81	1.09	Highly preferred
Other crop consultants	32	3.81	.86	Highly preferred
Other agronomic crop producers	32	3.41	.95	Moderately preferred
World Wide Web/Internet	32	3.22	1.21	Moderately preferred
Print publications/periodicals	32	2.66	1.21	Moderately preferred
Agricultural salespersons/representatives	32	2.28	.92	Slightly preferred
Print mass media (newspapers)	32	1.75	.88	Slightly preferred
Broadcast media (radio and television)	32	1.47	.76	Not preferred
Financial advisors	32	1.38	.71	Not preferred

The next preference for use component in which crop consultants were measured was crop variety selection. Means and standard deviations were computed for the 10 information

sources, and an interpretive analysis was conducted. The source with the highest mean for crop variety selection was the other crop consultants category ( $M=4.06$ ,  $SD=.84$ ). The source with the lowest mean score was the financial advisors ( $M=1.16$ ,  $SD=.45$ ). Data for the crop variety component are presented in Table 26.

Table 26. Statistical Data of the Preferences for Use of Selected Delivery Methods among Crop Consultants in Louisiana with Regard to Information Used in the Production of Agronomic Crops as Related to the Component Crop Variety Selection

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
Other crop consultants	32	4.06	.84	Highly preferred
LSU AgCenter personnel	32	4.03	.93	Highly preferred
LSU AgCenter print material	32	4.00	.80	Highly preferred
Other agronomic crop producers	32	3.63	.95	Highly preferred
World Wide Web/Internet	32	3.00	1.27	Moderately preferred
Agricultural salespersons/representatives	32	2.75	1.02	Moderately preferred
Print publications/periodicals	32	2.59	1.19	Moderately preferred
Print mass media (newspapers)	32	1.52	.81	Slightly preferred
Broadcast media (radio and television)	32	1.34	.60	Not preferred
Financial advisors	32	1.16	.45	Not preferred

The third preference for use component in which crop consultants were measured was pest management issues. Means and standard deviations were computed for the 10 information sources, and an interpretive analysis was conducted. The source with the highest mean for pest management issues was LSU AgCenter personnel ( $M=4.28$ ,  $SD=.85$ ). The source with the lowest mean score was financial advisors ( $M=1.16$ ,  $SD=.45$ ). Data for the pest management component are presented in Table 27.

Table 27. Statistical Data of the Preferences for Use of Selected Delivery Methods among Crop Consultants in Louisiana with Regard to Information Used in the Production of Agronomic Crops as Related to the Component Pest Management Issues

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
LSU AgCenter personnel	32	4.28	.85	Highly preferred
Other crop consultants	32	4.13	.79	Highly preferred
LSU AgCenter print materials	32	4.06	.98	Highly preferred
Other agronomic crop producers	32	3.25	1.14	Moderately preferred
World Wide Web/Internet	32	2.90	1.25	Moderately preferred
Print publications/periodicals	32	2.50	1.27	Moderately preferred
Agricultural salespersons/representatives	32	2.47	.88	Slightly preferred
Print mass media (newspapers)	32	1.53	.92	Slightly preferred

(Table continued)

Broadcast media (radio and television)	32	1.38	.71	Not preferred
Financial advisors	32	1.16	.45	Not preferred

A cumulative mean score was calculated for each of the 10 information sources by computing their scores from each of the three components (cultural practices, crop variety and pest management issues) related to agronomic crop production. The interpretive scale was then applied to each source to determine their overall preference of use. The source with the highest overall mean score was LSU AgCenter personnel ( $M=4.04$ ,  $SD=.85$ ). The group with the lowest overall mean was financial advisors ( $M=1.23$ ,  $SD=.48$ ). Data for the overall preference of use are presented in Table 28.

Table 28. Statistical Data for the Overall Preferences for Use of Selected Delivery Methods among Crop Consultants in Louisiana with Regard to Information Used in the Production of Agronomic Crops as Related to All Three Specific Components

Information Source	<i>n</i>	Mean	<i>SD</i>	Interpretation
LSU AgCenter personnel	32	4.04	.85	Highly preferred
Other crop consultants	32	4.00	.77	Highly preferred
LSU AgCenter print materials	32	3.96	.98	Highly preferred
Other agronomic crop producers	32	3.43	.85	Moderately preferred
World Wide Web/Internet	32	3.06	1.17	Moderately preferred
Print publications/periodicals	32	2.58	1.14	Moderately preferred
Agricultural salespersons/representatives	32	2.50	.79	Moderately preferred
Print mass media (newspapers)	32	1.61	.82	Slightly preferred
Broadcast media (radio and television)	32	1.40	.71	Not preferred
Financial advisors	32	1.23	.48	Not preferred

### Objective Ten

Objective ten was to determine if a model existed that explains a significant portion of the variance in LSU AgCenter information usage among agronomic crop producers in Louisiana from the following measurements:

- a. perceived awareness
- b. perceived accuracy
- c. age
- d. size of farm
- e. number of agronomic crops produced.

This objective was accomplished by performing a multiple regression analysis. The dependent variable used was the overall LSU AgCenter information mean usage score by agronomic crop producers. The independent variables were perceived awareness, perceived accuracy, age, size of farm and the number of agronomic crops produced.

The independent variables were used in a stepwise entry, and the model would contain only those variables that explained at least 1% of the variance.

The dependent variable was computed by summarizing the perception of the usage of LSU AgCenter information sources regarding the four aspects of agronomic crop production: cultural practices, crop variety selection, pest management issues and market issues.

For the independent variable perceived awareness, an overall awareness score was computed by summarizing all of the LSU AgCenter awareness items on the instrument. This consisted of six items concerning agronomic crop producers' awareness of six AgCenter information sources: LSU AgCenter website, research publications, parish extension office/agents, area research station personnel, LSU AgCenter newsletters and publications (electronic and print) and LSU AgCenter radio and television segments.

For the independent variable perceived accuracy, a similar procedure was performed. An overall perceived accuracy score was computed by summarizing the six LSU AgCenter information sources items on the instrument as they pertained to accuracy as perceived by the agronomic crop producers.

Two-way correlations were conducted for descriptive purposes between the independent variables in the regression model and the perception of usage score. The variable with the highest relationship with the overall LSU AgCenter information usage

score was perceived overall accuracy ( $r=.50$ ,  $p<.001$ ). The second highest relationship with the overall usage score was perceived overall awareness ( $r=.44$ ,  $p<.001$ ). The variable age ( $r=.15$ ,  $p=.03$ ) was the only other variable to have a significant relationship with the dependent variable overall usage score. These correlations are presented in Table 29.

Table 29. Relationship between Selected Agronomic Crop Producer Characteristics and Perceptions and the Overall Usage of LSU AgCenter Information

Characteristic	<i>r</i>	<i>p</i>
Overall accuracy	.50	<.001
Overall awareness	.44	<.001
Age	.15	.033
Number of crops farmed	-.10	.113
Size of Farm	.05	.271

Table 30 is the results of the multiple regression analysis. The independent variables were tested for multicollinearity. No evidence of collinearity were found based on  $VIF < 10$  and tolerances  $> .10$ . According to Hair et al. (1998), these thresholds are commonly used as the parameters in multiple regression analysis.

The variable that entered the model first was the perceived accuracy of the information source. This variable alone explained 25.1% of the variance in LSU AgCenter information usage among agronomic crop producers in Louisiana.

Only one other variable entered the model with the variable being the perceived awareness of LSU AgCenter information sources. This variable explained an additional 4.0% of the variance in LSU AgCenter information usage among agronomic crop producers in Louisiana.

In combination, these two variables explained 29.1% of the variance in LSU AgCenter information usage among agronomic crop producers in Louisiana. The

variables age, size of farm and number of crops produced did not enter the regression model. Data for the multiple regression analysis are presented in Table 30.

Table 30. Multiple Regression Analysis of the Overall LSU AgCenter Information Usage as Perceived by Louisiana Agronomic Crop Producers on Selected Variables

Source of variation	df	Ms	F-ratio	<i>p</i>
Regression	2	10.370	32.023	<.001
Residual	156	.340		
Total	158			

#### Model Summary

Variables	R <sup>2</sup> Cumulative	R <sup>2</sup> Change	F Change	<i>p</i> Change	Coefficient Beta
Overall accuracy	.251	.251	52.518	.000	.501
Overall awareness	.291	.040	8.889	.003	.241

#### Variables Not in the Equation

Variables	t	Sig. t
Age	1.032	.303
Number of crops produced	-.801	.424
Size of farm	1.183	.239

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

#### Summary of Purpose and Objectives

The primary purpose of this study was to determine the preferences of Louisiana agronomic crop producers and crop consultants in regard to acquiring information related to their agricultural operations. A secondary purpose was to determine how agronomic crop producers and crop consultants perceived selected LSU AgCenter information sources on accuracy, awareness and usefulness.

To help direct the researcher, the following objectives were developed by the researcher to guide the study:

2. To describe Louisiana agronomic crop producers on the following demographic characteristics:
  - a. Age;
  - b. Gender;
  - c. Race;
  - d. Agronomic crops produced and acres of each crop;
  - e. Percentage of income derived from agronomic crop production;
  - f. Size of farm in acres;
  - g. Years of farming agronomic crops;
  - h. Education.
2. To determine the perceived usefulness of selected information sources when making decisions regarding operations related to their farm among agronomic crop producers in Louisiana.
3. To determine the frequency of use of selected information sources among agronomic crop producers in Louisiana with regard to information that is used in the production of agronomic crops.



4. To determine the preferences for use of selected information sources among agronomic crop producers with regard to information used in the production of agronomic crops related to specific components of agronomic crop production.
5. To determine if a relationship exists between the perceived preferences for use of selected information sources as reported in objective 4 with regard to information used in the production of agronomic crops and the following selected demographic characteristics: age, number of crops farmed, education and acres farmed.
6. To determine the extent to which agronomic crop producers and crop consultants are aware of the information services of the LSU AgCenter.
7. To determine the frequency of use of crop production information distributed by the LSU AgCenter among agronomic crop producers and crop consultants in Louisiana as related to specific components of agronomic crop production.
8. To determine the accuracy of information sources provided by the LSU AgCenter as perceived by agronomic crop producers and crop consultants in Louisiana.
9. To determine the preferences for use of selected information sources among crop consultants with regard to information used in the production of agronomic crops related to specific components of agronomic crop production.
10. To determine if a model exists explaining a significant portion of the variance in LSU AgCenter information usage among agronomic crop producers in Louisiana from the following measurements:
  - a. Perceived awareness
  - b. Perceived accuracy
  - c. Age
  - d. Size of farm
  - e. Number of agronomic crops produced

## **Summary of Procedures and Methodology**

The target population for this study was two distinct groups. The first target population was large agronomic crop producers located in the state of Louisiana. The second target population was Louisiana agronomic crop consultants who serve clients in Louisiana.

The accessible population for the agronomic crop producers was those producers who attended specific crop commodity meetings across the state of Louisiana. For the crop consultants, the accessible population was those crop consultants who were members of the Louisiana Agricultural Consultants Association (LACA).

The sampling plan implemented by the researcher for the agronomic crop producers consisted of those producers who filled out survey instruments at eight commodity meetings held throughout the state in January and February 2011. These meetings yielded 216 returned surveys. A total of 176 surveys met the minimum requirements for inclusion in the sample and were used in the data analysis.

For the sampling plan involving crop consultants, the researcher used a list of electronic e-mail addresses provided by the LACA. This list contained a total of 62 e-mail addresses. Respondents were sent an electronic message which gave them the choice to respond to an electronic instrument or have the researcher mail them a copy and return it via the U.S. Postal Service. Thirty individuals chose to respond to the instrument electronically. Two individuals wanted the instrument to be mailed to them, and both returned the instrument complete with their responses.

The researcher used two instruments for the study. The instruments were similar but differed slightly to distinguish the different facets and roles of agronomic crop producers and crop consultants in their respective operations. For example, producers

were asked how many acres they farmed while consultants were asked how many acres they were responsible for providing consulting services.

Both instruments were researcher-designed questionnaires developed to accomplish the objectives of the study. The researcher used a review of related literature from previous studies to guide the instrument development along with reviewing an instrument used by Harmes (2009) in a study conducted among Nebraska agricultural producers.

Data for the agronomic crop producers were collected at eight meetings held throughout Louisiana in January and February 2011. These meetings were selected because they represented different geographic sections of the state, had been previously well-attended and represented the major agronomic crops grown in Louisiana. The meetings were held in Crowley, Delhi, Lafayette, Mansura, Monroe, New Roads, Rayville and White Castle.

The researcher made a short presentation at each meeting explaining the purpose of the survey. The surveys were then passed out to the attendees of the meeting. To encourage participation, those individuals who completed and returned the surveys were eligible for a drawing of two gift certificates to a national outdoors outlet. The surveys were then collected by the researcher.

For the consultants, an electronic version of the survey was sent to the e-mail addresses of all LACA members. Two weeks later, an e-mail reminder was sent to those individuals who had not responded. One week later, a second reminder was sent notifying those that had not responded that the survey would be closing in 24 hours. The following evening, the survey was closed. To encourage the consultants to participate, those that completed the survey were eligible for a gift certificate to a national outdoor outlet.

## Summary of Findings

The first objective of the study sought to describe Louisiana agronomic crops producers on the following demographic characteristics: age, gender, race, agronomic crops produced and acres of each crop, percentage of income derived from agronomic crop production, size of farm, years farming agronomic crops and education.

On the characteristic of age, the largest number of participants indicated that they were in the “45-54 years old” category ( $n=55$ , 31.8%). The group with the next highest number of participants was the “55-64 years old” category ( $n=42$ , 24.3%). These two groups represented 56.1% of the agronomic crop producers in the study. The ages of the respondents ranged from 24 to 80 years of age.

For gender, the majority of the respondents were male ( $n=172$ , 99.4%). Only one female was included in the study. The majority of respondents were Caucasian ( $n=172$ , 99.4%). One respondent reported being Hawaiian-Pacific Islander.

Regarding the number of different agronomic crops produced, the group having the largest number of participants was the group reporting “2” ( $n=64$ , 37.9%). The group with next highest number of participants was “3” ( $n=42$ , 24.9%). With regard to the type of crops grown, the majority of producers reported growing soybeans ( $n=127$ , 75.1%).

The majority of respondents ( $n=129$ , 77.2%) reported earning “76-100%” of their income from agronomic crop production. Regarding acreage, the group with the most participants was the “1000-1999 acres” category ( $n=44$ , 27.0%) followed closely by the “200-999 acres” category ( $n=39$ , 23.9%).

When examining the number of years producing agronomic crops, the group with the largest number of respondents was the group reporting “More than 30 years” ( $n=54$ , 33.1%). The second highest group was the “26-30 years” category ( $n=27$ , 16.6%).

On the variable highest level of education completed, the group with the largest number of respondents was the “college degree” category ( $n=72$ , 41.6%) followed closely by the ‘high school graduate/GED’ group ( $n=65$ , 37.6%).

The second objective sought to determine the perceived usefulness of selected information sources when making decisions regarding operations related to their farm among agronomic crop producers in Louisiana.

For this objective, an interpretative scale was developed and implemented by the researcher based on the mean score of the responses. The scale was based on the following: 1.00-1.50=“Not at all useful,” 1.51-2.50=“Slightly useful,” 2.51-3.50=“Moderately useful,” 3.51-4.50=“Highly useful” and 4.51-5.00=“Extremely useful.”

The source in which the respondents indicated the highest level of usefulness was crop consultants with a mean score of 4.11 ( $SD=.93$ ). Incorporating the interpretative scale, crop consultants were considered to be a “Highly useful” source. The lowest perceived usefulness was the broadcast media (radio and television) source with a mean score of 2.33 ( $SD=.96$ ). This rating earned broadcast media (radio and television) a “Slightly useful” rating.

Overall four sources (crop consultants, LSU AgCenter personnel, LSU AgCenter print materials and agricultural salespersons/representatives) earned a “Highly useful” rating. Five sources (other agronomic crop producers, World Wide Web/Internet, print publications/periodicals, financial advisors and print mass media (newspapers)) were rated as “Moderately useful.” Broadcast media (radio and television) was the only source to earn a “Slightly useful” rating.

The third objective sought to determine the frequency of use of selected information sources among agronomic crop producers in Louisiana with regard to information that is used in the production of agronomic crops.

An interpretative scale was used by the researcher to help determine how often producers used specific sources. The data were gauged on the mean responses of the participants. The scale was based on the following: 1.00-1.50="Never," 1.51-2.50="Rarely," 2.51-3.50="Sometimes," 3.51-4.50="Often" and 4.51-5.00="Always."

The source with the highest rating was crop consultants with a mean rating of 4.00 ( $SD=1.08$ ). Using the interpretative scale, crop consultants were used "Often." The source with the lowest rating was broadcast media (radio and television). This source received a mean rating of 2.34 ( $SD=.97$ ) which translated into the "Rarely" category on the interpretative scale.

Four information sources received an "Often" rating using the interpretative scale. Five sources received an interpretative rating of "Sometimes," and one source received a "Rarely" rating.

The fourth objective sought to determine the preferences for use of information sources among agronomic crop producers with regard to information used in the production of agronomic crops related to specific components of agronomic crop production. The four components were cultural practices, crop variety selection, pest management issues and market issues.

The results were based on the mean of the participants' responses. An interpretative scale was used to help understand the data. The scale was based on the following: 1.00-1.50="Not preferred," 1.51-2.50="Slightly preferred," 2.51-

3.50="Moderately preferred," 3.51-4.50="Highly preferred" and 4.51-5.00="Extremely preferred."

The source receiving the highest rating for the cultural practices component was crop consultants with a mean score of 4.00 ( $SD=1.08$ ). Using the researcher's interpretative scale, crop consultants were a "Highly preferred" source. The source receiving the lowest rating was broadcast media (radio and television) with a score of 2.11 ( $SD=1.01$ ). Broadcast media (radio and television) on the interpretative scale were considered to be "Slightly preferred."

For the cultural practices component, four sources were "Highly preferred." Three sources were rated "Moderately preferred," and three sources were "Slightly preferred."

The next component examined related to agronomic crop production was crop variety selection. The source receiving the highest rating was again crop consultants with a mean score of 4.04 ( $SD=1.04$ ). This yielded crop consultants a rating of "Highly preferred" on the interpretive scale. The source with the lowest rating was broadcast media (radio and television) with a mean score of 2.10 ( $SD=1.03$ ) and an interpretive rating of "Slightly preferred."

When examining all the sources, four sources were "Highly preferred," three sources were "Moderately preferred," and three sources were "Slightly preferred."

Pest management issues was the next component studied. The source which respondents reported the highest mean score was crop consultants. The mean score was 4.24 ( $SD=1.02$ ). On the interpretative scale, crop consultants were perceived as being "Highly preferred." The source receiving the lowest rating was financial advisors with a mean score of 2.07 ( $SD=1.23$ ) which equates to being a "Slightly preferred" source.

Overall, four sources were deemed “Highly preferred” for the pest management issues component. Three were considered “Moderately preferred,” and three were rated “Slightly preferred.”

The final component was market issues. The source with the highest mean score was World Wide Web/Internet with a mean score of 3.24 ( $SD=1.32$ ) and an interpretive rating of “Moderately preferred.” The source with the lowest rating was broadcast media (radio and television) with a mean score of 2.51 ( $SD=1.18$ ).

All 10 information sources for the market issues component were rated as “Moderately preferred” on the interpretive scale.

Additionally, a cumulative mean for each of the 10 information sources was computed using their scores across all four components. The source receiving the highest cumulative mean score with a mean score of 3.78 ( $SD=.92$ ) was crop consultants. This represented a “Highly preferred” rating on the interpretive scale. The source with the lowest cumulative mean score was broadcast media (radio and television). Its mean score was 2.21 ( $SD=.97$ ), and it earned a “Slightly preferred” rating.

Overall, three sources were considered to be “Highly preferred” sources. Four sources were “Moderately preferred,” and three were “Slightly preferred.”

The fifth objective sought to determine if a relationship existed between the perceived preferences for use of selected information sources with regard to information used in the production of agronomic crops and the following demographic characteristics: age, number of crops farmed, education and acres farmed.

Significant relationships were shown to exist between age and the perceived preferences of five information sources: agricultural salespersons ( $r=-.21, p<.004$ ), broadcast media ( $r=-.15, p<.043$ ), crop consultants ( $r=-.20, p<.008$ ), print mass media



(newspapers) ( $r=-.16, p<.042$ ) and the World Wide Web ( $r=-.18, p<.016$ ). The nature of the relationship between the five sources was a negative relationship between age and the five information sources. This relationship indicated that as age increased a respondent was less likely to prefer to use these sources for information. Using descriptors established by Davis (1971), the relationships were described as a low association.

The second variable examined for a relationship between perceived preferences for use of information sources was the number of crops farmed. Significant relationships were found between number of crops farmed and the perceived preferences for use of two information sources. These sources were LSU AgCenter personnel ( $r=-.23, p<.003$ ) and LSU AgCenter print material ( $r=-.19, p<.012$ ). This relationship was negative and indicated that as the number of crops produced increased, the producers were less likely to prefer these two AgCenter information sources. Davis (1971) descriptors described these correlations as being a low association.

The next variable examined for a relationship between perceived preferences for use of selected information sources was education. Significant relationships were shown between education and the perceived preferences of four information sources: broadcast media ( $r=-.20, p<.001$ ), crop consultants ( $r=-.12, p<.038$ ), financial advisors ( $r=-.17, p<.005$ ) and the print mass media ( $r=-.20, p<.001$ ). The nature of the relationships between the four sources was a negative relationship between education and the four information sources. This relationship indicated that as education increased a respondent was less likely to prefer to use these four sources for information. Number of total acres farmed was the final variable examined for a relationship regarding the perceived preferences of selected information sources. No significant differences were found between this variable and the 10 information sources. All of the relationships between the

number of acres farmed and perceived preferences of selected information sources showed a low negative association based on Davis (1971) descriptors.

The sixth objective sought to determine the extent to which agronomic crop producers and crop consultants are aware of the information sources provided by the LSU AgCenter. Producers and consultants were measured independently. For this objective, an interpretative scale was developed and employed by the researcher based on the mean responses of the participants. The scale was based on the following: 1.00-1.50="Not at all aware," 1.51-2.50="Slightly aware," 2.51-3.50="Moderately aware," 3.51-4.50="Highly aware" and 4.51-5.00="Extremely aware."

The LSU AgCenter information source in which the agronomic crop producers reported the highest level of awareness was the parish extension office/extension agent with a mean score of 4.16 ( $SD=1.08$ ). Incorporating the interpretative scale, agronomic crop producers were "Highly aware" of the parish extension office/extension agent. The lowest perceived awareness was the AgCenter radio and television segments with a mean score of 2.97 ( $SD=1.27$ ). This rating earned AgCenter radio and television segments a "Somewhat aware" rating.

An overall awareness score for agronomic crop producers was established by determining a mean for all the items in the instrument pertaining to AgCenter awareness. The overall awareness score for LSU AgCenter information sources was 3.78 ( $SD=.75$ ) which converted to a "Highly aware" rating using the interpretive scale.

Overall, five of the six AgCenter information sources earned a "Highly aware" rating. Only the AgCenter radio and television segments failed to reach the "Highly aware" rating.

For crop consultants, the same anchored and interpretive scales were used. The LSU AgCenter information source that received the highest mean from the crop consultants was the AgCenter website. It received a mean score of 4.56 ( $SD=.67$ ). Using the interpretive scale, crop consultants were “Extremely aware” of the LSU AgCenter website. The lowest perceived awareness by the crop consultants was the AgCenter radio and television segments with a mean score of 2.41 ( $SD=1.27$ ). This rating earned AgCenter radio and television segments a “Slightly aware” rating.

Only one AgCenter information source (the website) received an “Extremely aware” rating by the crop consultants. Four sources were rated “Highly aware” by the consultants with one source earning a “Slightly aware” rating.

The seventh objective sought to determine the frequency of use of crop production information distributed by the LSU AgCenter among agronomic crop producers and crop consultants in Louisiana as related to specific components of agronomic crop production. These components were cultural practices, crop variety selection, pest management issues and market issues.

An interpretive scale was used by the researcher to help determine how often producers and consultants used AgCenter information. The scale was based on the following: 1.00-1.50=“Never,” 1.51-2.50=“Rarely,” 2.51-3.50=“Sometimes,” 3.51-4.50=“Often” and 4.51-5.00=“Always.”

Regarding the frequency of use of AgCenter information related to specific components of agricultural production, crop variety selection received the highest mean with a score of 4.20 ( $SD=.86$ ) from agronomic crop producers. Using the interpretive scale, this score was deemed “Often.” The component with the lowest mean score as

perceived by producers was market issues with a mean score of 3.10. This earned market issues a rating of “Sometimes.”

The two other components, pest management issues and cultural practices, both earned an “Often” rating from the agronomic crop producers using the interpretive scale.

For crop consultants, the component receiving the highest mean regarding the frequency of use of AgCenter information was pest management issues. It received a mean score of 4.19 ( $SD=.82$ ). This formulated into a rating of “Often.” Market issues was the component receiving the lowest mean score with a mean score of 2.31. Using the interpretive scale, it was rated as “Rarely.”

The two other components, crop variety selection and cultural practices both earned a rating of “Often” from the consultants using the interpretive scale.

The eighth objective was to determine the accuracy of information sources provided by the LSU AgCenter as perceived by both agronomic crop producers and crop consultants. Again, producers and consultants were measured independently. For this objective, an interpretative scale was conceived and used by the researcher based on the mean responses of the participants. The scale was based on the following: 1.00-1.50=“Not at all accurate,” 1.51-2.50=“Somewhat accurate,” 2.51-3.50=“Moderately accurate,” 3.51-4.50=“Highly accurate” and 4.51-5.00=“Extremely accurate.”

The LSU AgCenter information source in which the agronomic crop producers reported the highest level of accuracy was the area research station personnel source with a mean score of 4.10 ( $SD=.73$ ). Using the interpretative scale, agronomic crop producers considered area research station personnel to be a “Highly accurate” source for information regarding agronomic crop production. The lowest perceived accuracy was

the AgCenter radio and television segments with a mean score of 3.67 ( $SD=1.27$ ). This rating also earned AgCenter radio and television segments a “Highly accurate” rating.

An overall accuracy score was computed by determining a mean from all six information sources items in the instrument pertaining to AgCenter accuracy. The overall accuracy score as perceived by producers for LSU AgCenter information sources was 3.98 ( $SD=.60$ ) which converted to a “Highly accurate” rating using the interpretive scale. Overall, all six AgCenter information sources earned a “Highly accurate” rating.

For crop consultants, area research station personnel had the highest level of accuracy with a mean score of 4.22 ( $SD=.79$ ). The corresponding rating on the interpretive scale gave this source a “Highly accurate” rating. The source with the lowest mean score was LSU AgCenter radio and television segments with a score of 2.88 ( $SD=1.31$ ). This mean score equated to a “Moderately accurate” rating.

Four of the AgCenter information sources were seen as being “Highly accurate” by the crop consultants, and two sources were rated “Moderately accurate” by the group.

The overall accuracy mean score given by crop consultants to AgCenter information sources was 3.65 ( $SD=.80$ ). On the interpretive scale, AgCenter information sources were considered to be “Highly accurate.”

The ninth objective sought to determine the preferences of use of selected information sources among crop consultants with regard to information use in the production of agronomic crops. In this objective, three components of agriculture crop production were studied: cultural practices, crop variety selection and pest management issues.

An interpretive scale was used for this objective based on the mean scores for each of the information sources. The scale was based on the following: 1.00-1.50=“Not

preferred,” 1.51-2.50=“Slightly preferred,” 2.51-3.50=“Moderately preferred,” 3.51-4.50=“Highly preferred” and 4.51-5.00=“Extremely preferred.”

The sources receiving the highest mean scores for the cultural practices component by crop consultants was LSU AgCenter personnel ( $M=3.81$ ,  $SD=1.03$ ) and LSU AgCenter print material ( $M=3.81$ ,  $SD=1.09$ ). Both of the sources were “Highly preferred” according to the interpretive scale. The source receiving the lowest rating was financial advisors with a score of 1.38 ( $SD=.71$ ). Financial advisors on the interpretive scale were considered to be “Not preferred.”

For cultural practices, three sources were determined to be “Highly preferred.” Three sources were rated “Moderately preferred,” and two sources were “Slightly preferred.” Two sources were judged to be “Not preferred” on the interpretive scale.

The next component studied related to agronomic crop production was crop variety selection. The source receiving the highest rating was other crop consultants with a mean score of 4.06 ( $SD=.84$ ). This yielded other crop consultants a rating of “Highly preferred” on the interpretive scale. The source with the lowest rating was financial advisors with a mean score of 1.16 ( $SD=.45$ ) and an interpretive rating of “Not preferred.”

When examining all the sources, four sources were “Highly preferred,” three sources were “Moderately preferred,” one source was “Slightly preferred” and two sources were “Not preferred.”

Pest management issues was the last component studied. The source which respondents reported the highest mean score was LSU AgCenter personnel. The mean score was 4.28 ( $SD=.85$ ). On the interpretative scale, LSU AgCenter personnel were perceived as being a “Highly preferred” source. The source receiving the lowest rating

was financial advisors with a mean score of 1.16 ( $SD=.45$ ) which equates to being a “Not preferred” source.

Overall, three sources were deemed “Highly preferred” for the pest management issues component. Three were considered “Moderately preferred,” and two were rated “Slightly preferred.” Two sources were rated “Not preferred.”

A cumulative mean for each of the 10 information sources was computed using their scores across all three components. The source receiving the highest cumulative mean score with a score of 4.04 ( $SD=.85$ ) was LSU AgCenter personnel. This represented a “Highly preferred” rating on the interpretive scale. The source with the lowest cumulative mean score was financial advisors. Its mean score was 1.23 ( $SD=.48$ ), and it earned a “Not preferred” rating.

Overall, three sources were considered to be “Highly preferred” sources. Four sources were “Moderately preferred,” one source was “Slightly preferred,” and two were “Not preferred.”

The tenth objective was to determine if a model exists explaining a significant portion of the variance in LSU AgCenter information usage as perceived among agronomic crop producers in Louisiana from the following variables: perceived awareness, perceived accuracy, age, size of farm and number of agronomic crops produced.

A multiple regression analysis was performed to accomplish this objective. The dependent variable for the analysis was the overall AgCenter information usage score of agronomic crop producers. It was computed by summarizing the perception of the usage of AgCenter information sources regarding the four aspects of agronomic crop production: cultural practices, crop variety selection, pest management issues and market

issues. The variables perceived awareness, perceived accuracy, age, size of farm and the number of agronomic crops produced were treated as independent variables, and a stepwise entry of variables was used. For this model, variables were only added if they increased the variance by at least 1% and as long as the equation remained significant.

The variable that entered the model first was the perceived accuracy of the information source. By itself, this variable explained 25.1% of the variance in the usage of LSU AgCenter information sources.

Only one other variable, perceived awareness, was entered in the model. This variable explained another 4.0% of the variance in the usage of AgCenter information sources.

The two variables, perceived accuracy and perceived awareness, combined to explain a total of 29.1% of the variance in the usage of AgCenter information sources by agronomic crop producers in Louisiana.

### **Conclusions, Implications and Recommendations**

Based upon the findings of this study, the following conclusions, implications and recommendations were formulated by the researcher:

1. Agronomic crop producers in Louisiana are diversified in relation to the number of agronomic crops produced.

This conclusion is based on the finding that 81.1% of agronomic crop producers are engaged in producing more than one crop. Only 18.9% ( $n=32$ ) reported growing only one crop. The mean number of crops grown was 2.49 ( $SD=1.12$ ). A small contingent of growers ( $n=11$ , 6.5%) stated that they grew five different crops.

There are several factors that may contribute to the diversification of agronomic crop producers. Some of these factors include a crop rotation schedule, market prices of



the commodity, input costs related to the specific crop(s) and contracts between the landowners and the agronomic crop producers. Environmental factors such as soil types and the availability of water for irrigation also influence the number of crops produced. Lastly, many agronomic crop producers have a personal preference toward producing a specific crop. Many producers in the southwest portion of the state are primarily rice farmers because of the long history of rice being grown in this area.

Most agronomic crop producers rotate crops in order to maximize their current and future production. Crop rotation is a tool that helps manage for insects and other pests such as pathological diseases and weeds. Rotating a legume crop into a field helps fix nitrogen in the soil and increases the fertility for the subsequent crop (Gardner, Pearce, & Mitchell, 1985).

Market prices and futures often determine which crops a farmer will grow. While limiting factors such as equipment, soil types and infrastructure needs can restrict the types of crops producers can grow, generally there is enough flexibility for a producer to select between several types of crops and number of acres of each crop. Depressed prices for rice may lead a northeast Louisiana grower to switch to grain sorghum, corn or cotton. The same situation in southwest Louisiana may lead a farmer to decrease acreage from rice and switch those acres to soybeans.

Additionally, by growing different crops, a producer lessens his risk in the event of a price collapse for a specific commodity. The producer may be able to reduce his loss through the income generated in the other crops being grown. It is the farmer's approach of "not putting all his or her eggs in one basket" manner of doing business.

Input costs can influence the type of crops grown and the acreage. High fuel prices plaguing farmers currently may persuade producers to grow a crop that requires

less tillage, less fertilization and fewer applications of pesticides because of the cost associated with the number of trips through a field required by farming equipment to accomplish these tasks. For example, corn production requires a substantial amount of nitrogen fertilizer. Typically, the cost of nitrogen fertilizer mirrors the energy market because it is energy-intensive to produce. Therefore, a producer may opt to produce soybeans over corn due to the high fertilization costs associated with corn production.

Many crop producers rent land, and the arrangements between the landowner and the producer can have a direct influence on the crop(s) produced. If a landowner has a business interest in a cotton gin, he or she may stipulate that a certain amount of acreage of land be planted in cotton. Under these conditions, the landowner is ensuring that his or her gin will have cotton to gin. Therefore, a producer may be required to grow some cotton when that producer may have preferred to put that land into another crop such as corn or soybeans. A similar arrangement may occur when a landowner has a vested interest in a sugar or rice mill.

Because of the diversified nature of agronomic crop production, the researcher recommends that the AgCenter continue research in a variety of agronomic crops. In 2010, approximately 2.9 million acres of the eight major agronomic crops were produced in Louisiana (Louisiana Cooperative Extension Service, 2011). These crops were corn, cotton, milo/grain sorghum, rice, soybeans, sugarcane, sweet potatoes and wheat. Producers received nearly \$2 billion dollars through the production of these crops (Louisiana Cooperative Extension Service, 2011). Continuing research is necessary in order to ensure that this vital industry continues to be successful and contributes significantly to the state's economy.

To ensure that this research continues, the AgCenter should continue to maintain personnel with expertise in the production of agronomic crops. The personnel should be experts in cultural practices, crop variety development, pest management issues and market issues. Additionally, they also should be located in areas with the greatest involvement in agronomic crop production. By locating them in these areas, crop producers and consultants may call upon them for their expertise.

The researcher further recommends that maintaining this expertise should be a priority. Currently, researchers are located in areas that have large acreage of agronomic crops at Louisiana Agriculture Experiment stations. However, current funding for the AgCenter has been decreasing due to funding cuts to higher education. These cuts have led to an understaffing at several stations that are mainly involved with research related to agronomic crop production. While the current economic climate does not foreshadow a positive outlook regarding increased funding, the administration of the AgCenter should make expanding personnel in this area a priority when economic conditions improve.

The researcher also recommends that a strong Cooperative Extension Service presence should continue to be maintained by the AgCenter in areas that are engaged in agronomic crop production. The extension service has a long history of disseminating information to crop producers (Seevers, Graham, Gamon, & Conklin, 1997). There is a need for information related to crop production, and producers have become reliant upon the extension service for that information. The relationship between the extension service and the experiment stations and their combined efforts in agronomic crop production are beneficial to growers throughout the state.

The extension service is also suffering from the same funding crisis that is hampering the experiment stations across the state. The researcher recommends that a

similar point of emphasis should be made by AgCenter administrators for hiring extension agents with strong agronomic crop production backgrounds to help ease the burdens of those agents having to work large geographical areas or serving large number of farmers when economic conditions allow.

The researcher further recommends that additional research be conducted that examines some of the reasons why agronomic crop producers in Louisiana and other states choose the crops to grow that they do. These studies could help determine what factors are most influential. Is it agronomic factors such as the soil types that limit production to a specific crop or is it market prices that are most influential? Do landowner agreements play a premium as to what is grown or is it equipment needs or input costs? Determining what factors influence a producer's decision or can give individuals involved in agriculture a better idea of what crops may be grown in the future. This could help agriculture-related businesses prepare for issues such as the allotment of seeds for upcoming seasons, fertilizer requirements, and how market forces may respond to forthcoming crop production.

2. Soybeans are the most common grown crop in Louisiana.

This conclusion is based on the finding that 127 producers (75.1%) in this study reported growing soybeans. This finding is also supported by the 2010 Louisiana Summary (Louisiana Cooperative Extension Service, 2011). It reported that nearly 2,200 producers grew soybeans during 2010. This number represented the most growers for any agronomic crop in the state. Soybeans also accounted for the most acreage at approximately 1,000,000 acres (Louisiana Cooperative Extension Service, 2011).

There are several reasons for the popularity of soybeans. The reasons include: can be used easily in a crop rotation, does not require any specialized equipment, adaptive to many soil types found in Louisiana, and in most years are profitable.

According to Ronnie Levy, the state soybean specialist for the LSU AgCenter, soybeans are an excellent crop to use in a rotation (R. Levy, personal communication, May 2, 2011). For example, soybeans can be planted in April on fallow sugarcane land and harvested in August or early September. A cane farmer can then begin to plant cane after the soybean harvest which is usually the time when cane is planted. This allows a cane producer to generate income on a fallow field. Rice farmers also utilize soybeans in fallow fields.

Another beneficial component of using soybeans in a crop rotation according to Levy is that soybeans help fixate nitrogen in the soil. Legume crops, such as soybeans, take nitrogen from the air and basically put it into the soil (R. Levy, personal communication, May 2, 2011). This nitrogen increases the fertility of the soil benefiting the next agronomic crop grown in the same field.

Another advantage for growing soybeans is that no specialized equipment is required (R. Levy, personal communication, May 2, 2011). Most agronomic crop producers who grow other agronomic crops other than soybeans will have the necessary equipment with only minor modifications needed to grow and harvest soybeans. A spray rig for spraying cotton fields can be used in a soybean field. A combine for harvesting rice or wheat can be used in harvesting soybeans. Crops such as sugarcane or cotton require specific equipment for harvesting which can only be used for those crops thus requiring more investment in the form of equipment expenditures. A significant

investment is not necessarily needed for soybeans if one is already engaged in agronomic crop production.

Soybeans are also adaptive to the many soil types found in Louisiana. This situation is evident by the fact that soybeans are grown throughout the state. Soybeans were grown in 46 parishes in 2010 (Louisiana Cooperative Extension Service, 2011).

Finally, the demand for soybeans is high according to Kurt Guidry, an LSU AgCenter economist who specializes in several agronomic crops including soybeans (K. Guidry, personal communication, May 2, 2011). Soybean prices have increased approximately 40% in the past year and are currently in the \$13-14 a bushel range. At this price, even with the high input costs for fuel and fertilizer, Guidry says Louisiana farmers can expect a profit on growing soybeans if harvest yields are equal to historical averages for the state.

The researcher recommends that support for research related to soybeans be a priority for the LSU AgCenter because of its importance as an economic crop along with the fact that they are a crop with an agronomic niche in the state. Soybeans are an excellent rotation crop and offer producers a chance to earn income on what would generally be fallow grounds. They also offer increased fertility to the soil making them an important management tool for producers. With demand for soybeans expected to rise, it is quite possible that acreage in Louisiana will increase making this crop even more important.

3. Louisiana agronomic crop producers and consultants are educated groups.

This conclusion is based on the findings that the majority of agronomic crop producers ( $n=106$ , 61.3%) and crop consultants ( $n=32$ , 100%) had received some post secondary education. Both of these figures are higher than the general population of

Louisiana according to the Louisiana Board of Regents Master Plan (2009) that stated 56% of Louisiana adults had not received any college work.

The report (Louisiana Board of Regents, 2009) also stated that only 27% of Louisiana adults had achieved an associate's degree or higher. Agronomic crop producers reported that 48.6% ( $n=84$ ) had received a college degree or an advanced degree. Crop consultants were even higher with 96.9% ( $n=31$ ) reporting they had a college or advanced degree.

According to Risenberg and Obel Gor (1989), educational differences are factors that should be considered when communicating with an agricultural-based audience. The researchers found that education plays a role and should be considered in communicating with this audience. They indicated that as an individual's education increased they were more likely to use mass media sources.

Daberkow and McBride (2003) found that education was a factor concerning the adoption of new agricultural techniques. Adopters of new techniques related to precision agriculture tended to be younger, more likely to be full-time farmers and better educated. This development may direct AgCenter researchers which farmers to seek out to try new techniques for crop production in agricultural trials and experiments.

Education is a factor that influences Internet usage. According to Hindman (2000), being in a rural environment like many farmers are is not a constraint to using the Internet. He found that income, age and education were stronger indicators of Internet use. Hindman found that the more educated individuals are, the more likely they are to engage in Internet usage. Park and Mishra (2003) had a similar finding. They stated that for every additional year of education a farmer received, Internet usage increased by 2.6%.

Because agronomic crop producers are an educated group, the researcher recommends that the AgCenter use a variety of information techniques to communicate with producers. One method that could see substantial growth is the Internet. The researcher recommends that the LSU AgCenter continue to maintain a website that both producers and consultants can access to acquire information related to agronomic crop production. Because of the popularity of smartphones, producers and consultants have access to this resource virtually anywhere in the state. A website with information such as pictures of common crop insect pests would be extremely useful to a producer or consultant who may have never encountered this insect before. The finding that crop consultants are “Extremely aware” of the AgCenter website ( $M=4.56$ ,  $SD=.67$ ) and consider it to be a “Highly accurate” information source ( $M=3.94$ ,  $SD=.80$ ) emphasizes the importance of maintaining a website.

The website must be well-maintained and have the most current information in order to best serve the users of the site. Information posted must be reviewed not only by content reviewers who specialize in the agronomic arena, but it should also be reviewed by editors who check for inaccuracies such as spelling or grammatical errors. This thorough review procedure will ensure that the website maintains a professional appearance and be seen as a reputable and accurate source for agronomic crop information.

The researcher also recommends determining how many producers and consultants possess smartphones and how they are incorporating them into their operations. The researcher recommends that further research be conducted by agriculture communicators examining how much time producers and consultants dedicate to Internet usage and if Internet usage is dependent upon the type of crops grown. A comment by



one of the consultants on the survey was that he finds himself “more and more dependent upon the Internet.” Therefore, research in this area could be beneficial to producers, consultants and communicators.

4. Crop consultants are an important information resource for Louisiana agronomic crop producers.

This conclusion is based on the following findings in the study. Crop consultants had the highest mean scores in terms of usefulness ( $M=4.11$ ,  $SD=.93$ ), and frequency of use ( $M=4.00$ ,  $SD=1.08$ ) and were the most preferred source for the agronomic components of cultural practices ( $M=4.00$ ,  $SD=1.08$ ), crop variety selection ( $M=4.04$ ,  $SD=1.04$ ) and pest management issues ( $M=4.24$ ,  $SD=1.02$ ).

Crop consultants generally are paid for their services (R. Carter, personal communication, May 4, 2011). Therefore, they respond to the needs of the agronomic crop producers in a timely manner. Generally, if a producer is paying for consulting services, the producer will contact the consultant first regarding issues related to agronomic crop production as compared with other information sources.

As evidenced by the finding that crop consultants are a highly educated group, they possess a wealth of knowledge related to agronomic crop production. This knowledge is useful to their clientele.

Because agronomic crop producers rely on crop consultants for much of their information related to agronomic crop production, the researcher recommends that AgCenter personnel work closely with consultants to help disseminate research-based information generated by the AgCenter. To help facilitate the sharing of information, the researcher recommends that AgCenter personnel and the Louisiana Agricultural Consultants Association (LACA) share contact information so that information regarding

agronomic crop issues can be disseminated in a timely manner. For example, if a new technique is developed by the AgCenter for dealing with herbicide-resistant weeds, this information can be sent via email to all consultants who can then pass this information on to their clients.

Further research to determine what issues are confronting Louisiana agronomic crop producers should be conducted. The researcher recommends that AgCenter scientists work closely with crop consultants in deciding the most pressing issues of agronomic crop producers. By communicating with consultants, AgCenter scientists can develop projects based on problems confronting the industry that will benefit producers.

AgCenter personnel also should make deliberate efforts to work with consultants to publicize AgCenter recommendations. Because of the close relationship between producers and consultants, the AgCenter can use consultants to make producers aware of new crop recommendations.

5. The LSU AgCenter is an important information source for agronomic crop producers.

This conclusion is based on the findings that the two LSU AgCenter information sources (LSU AgCenter personnel and print materials) were considered to be “Highly useful,” “Often” used, and a “Highly preferred” source for cultural practices, crop variety selection and pest management issues.

On the issue of awareness, crop producers were “Highly aware” of five of the six AgCenter information sources. On the issue of accuracy, all six information sources were considered to be “Highly accurate.”

These findings underlie the importance of the LSU AgCenter with regard to information related to agronomic crop production and that agronomic crop producers

have become reliant upon the AgCenter for information. It also helps reinforce the premise that the AgCenter is fulfilling its role and mission as a land-grant institution with an emphasis on agriculture.

Other studies have had similar findings that extension is an important source for agricultural information. Licht and Martin (2006) indicated that personal consultations were frequently used information sources by Iowa corn and soybean growers, and these personal consultations included extension personnel. Beef producers in Florida reported using extension personnel for information more than 50% of the time (Vergot III, Israel & Mayo, 2005). When Texas producers sought information regarding the 2002 Farm Bill, they turned to the Texas Cooperative Extension (Catchings, Wingenbach, & Rutherford, 2005).

The researcher recommends that further research be conducted regarding the AgCenter's importance as a source of information in other agricultural areas. This research should include an examination of the AgCenter as a source of information related to other agricultural enterprises.

The areas in which similar studies could be undertaken are numerous. Studies could be conducted in the areas of horticulture crops, ornamentals, forestry, horses and aquaculture. All of these areas play an important role in Louisiana agriculture. These studies could focus on variety of areas such as usefulness, accuracy and awareness of AgCenter information sources.

6. Crop consultants rely on the LSU AgCenter for information related to agronomic crop production.

This conclusion is based on the finding that crop consultants use AgCenter information "Often" regarding pest management issues, crop variety selection and

cultural practices. Other evidence that supported this finding is that LSU AgCenter personnel and LSU AgCenter print material are “Highly preferred” sources for these three components.

One reason that crop consultants may rely on AgCenter information is that consultants perceive AgCenter information as being “Highly accurate,” as well as unbiased. This finding is based on the overall accuracy score of 3.65 ( $SD=.80$ ) for AgCenter information sources.

Because crop consultants are the most important source of information for crop producers and consultants rely heavily on the AgCenter for information, the researcher recommends that the AgCenter should continue strong research and extension programs because of the important role they play in agronomic crop production. It could be argued that because the primary source for agronomic crop producers, the consultants, is heavily dependent upon the AgCenter for information, the AgCenter is the “de facto” primary source of information.

Because of the symbiotic relationship between producers, consultants and the AgCenter, the AgCenter could benefit if growers were more aware that their primary source of information the AgCenter. The AgCenter could be the recipient of more grower-funded initiatives related to research in crop production. Government funding could be increased or at least not reduced during hard financial times if governing officials were aware of the important role the AgCenter plays in crop production information.

Bob Hutchinson, former LSU AgCenter Northeast Regional Director, stated in a discussion with the researcher that there seems to be a “disconnect” between the growers and the AgCenter as to where information is coming from and being generated (personal

communication June 25, 2008). He hypothesized that growers were relying on consultants more and more, yet the AgCenter was supplying the consultants with much of the information that was being used by the consultants. The results of this study seem to support this connection.

Cooperation between the AgCenter and consultants must occur because the AgCenter lacks the personnel to respond to all grower-related inquiries in a timely manner. Consultants can react more quickly and have a compensation incentive to do so. Therefore, a strong relationship between consultants and the AgCenter can assist in having an agronomic crop industry that flourishes.

The researcher recommends that further research be conducted by other land-grant institutions to see if consultants and producers in their respective states are reliant upon land-grant institutions for information related to agronomic crop production. If evidence indicates that the land-grant institutions are a primary source for information, these institutions could argue that by reducing federal and state monies for agricultural research and extension programs production agriculture across the country would suffer.

7. Interpersonal communication is a preferred method for communicating among Louisiana agronomic crop producers and consultants.

This conclusion is based on the findings that interpersonal communication sources were most popular in terms of usefulness, and frequency of use and were preferred sources regarding issues related to agronomic crop production. Evidence that supports this finding is crop consultants ( $M=4.11$ ,  $SD=.93$ ), LSU AgCenter personnel ( $M=3.97$ ,  $SD=.86$ ), agricultural salespersons/representatives ( $M=3.73$ ,  $SD=.81$ ) and other agronomic crop producers ( $M=3.31$ ,  $SD=.89$ ) ranked first, second, fourth and fifth

respectively for perceived usefulness by agronomic crop producers. Three of the sources were considered “Highly useful,” and one source was considered “Moderately useful.”

When examining perceived frequency of use, producers ranked crop consultants ( $M=4.00$ ,  $SD=1.08$ ), agricultural salespersons/representatives ( $M=3.89$ ,  $SD=.80$ ), LSU AgCenter personnel ( $M=3.68$ ,  $SD=.86$ ), and other agronomic crop producers ( $M=3.22$ ,  $SD=.89$ ), first, second, third and fifth in terms of frequency of use. Three sources were used “Often,” and one source was used “Sometimes.”

Other evidence that supports agronomic crop producers’ reliance upon interpersonal communication sources is the cumulative mean score for information sources related to four components (cultural practices, crop variety selection, pest management issues and market issues) of agronomic crop production that examined preference. Four of the top five sources were interpersonal communication: crop consultants ( $M=3.78$ ,  $SD=.92$ ), LSU AgCenter personnel ( $M=3.73$ ,  $SD=.85$ ), agricultural salespersons/representatives ( $M=3.42$ ,  $SD=.86$ ) and other agronomic crop producers ( $M=3.36$ ,  $SD=.85$ ). These sources ranked first, second, fourth and fifth respectively.

A similar pattern existed for three of the components when they were examined individually. The only component that did not follow this pattern was the market issues component.

For consultants, this conclusion is supported by the cumulative mean score for information sources related to three components (cultural practices, crop variety selection and pest management issues) of agronomic crop production that examined preference. Three of the top four sources were interpersonal communication sources: LSU AgCenter personnel ( $M=4.04$ ,  $SD=.85$ ), other crop consultants ( $M=4.00$ ,  $SD=.77$ ) and other agronomic crop producers ( $M=3.43$ ,  $SD=.85$ ). These sources ranked first, second and

fourth respectively. Two sources were considered to be “Highly preferred” by the consultants with one source being “Moderately preferred.”

When the components were examined individually, a similar pattern was found to exist in that interpersonal communication sources were the preferred source. Both consultants and producers had similar findings related to interpersonal communication.

This study outcome is consistent with the findings of other studies that have examined interpersonal communication within the field of agriculture. Risenberg and Obel Gor (1989) determined that on-farm demonstrations (54.3%) followed by tours and field trips (48.6%) were the most preferred methods for receiving information in Nez Perce County, Idaho. Licht and Martin (2006) stated that Iowa corn and soybean farmers preferred interpersonal communication methods if an issue was complex or specific information was needed. The authors stated that consultations with extension personnel were excellent sources for these types of issues. Padel (2001) found that organic farmers relied upon other organic farmers and organic advisors for information related to organic crop production. A possible reason for this stated in the study was that organic farmers saw their operations as being specialized and were less likely to use sources that serve the general agriculture industry.

There are some dynamics that lead to a high degree of interpersonal communication in Louisiana agriculture. The first reason is that there is long history of agronomic crop production in the state. Because it is an established industry, a network that includes commodity groups and individuals employed in agriculture-related businesses exist thus providing a conduit for the spread of information through interpersonal methods.

Secondly, the existence of a strong research arm through the Louisiana Agriculture Experiment Stations and extension offices located in every parish has created a system that producers can rely on for information. Much of this information is disseminated through interpersonal communication such as field days, personal visits and on-farm variety trials.

Another factor that increases the use of interpersonal communication is the arrangement between growers and consultants. Growers hire consultants to help them produce successful crops. This arrangement causes consultants to make personal visits to producer fields and make recommendations to the growers that the consultant believes will benefit the farmer through better yields or decreased crop inputs. These consultations lead to greater incidence of interpersonal communication.

An implication from this finding is that producers and consultants are dependent upon information through interpersonal communication. This situation will require the LSU AgCenter and its personnel to allow time for personal consultations with both growers and consultants. These consultations do not necessarily have to be one-on-one meetings but could involve making presentations at commodity meetings, staging or making a presentation at a local or station field day or becoming involved in on-farm research plots.

The researcher recommends that organizations such as land-grant institutions or private seed companies who communicate with individuals engaged in agriculture conduct further research to examine how influential information sources are actually modifying both producers and consultants' behavior. For example, if an interpersonal communication source makes recommendations that contradict a source that is not an interpersonal source, what source will influence the producer or consultant to act on the



recommendation? Research could also compare interpersonal to interpersonal sources to determine which ones are most influential in modifying behaviors. A comparable approach could be used on sources that are not interpersonal. By determining what type of source is most influential, more effective information campaigns may be developed by organizations.

8. Agronomic crop producers do not have a preferred source of information regarding market issues.

This conclusion is based on the finding that all 10 information sources were considered “Moderately preferred” on the interpretive scale used by the researcher. The highest mean score for a source was the World Wide Web/Internet ( $M=3.24$ ,  $SD=1.32$ ). The lowest mean score was broadcast media (radio and television) ( $M=2.51$ ,  $SD=1.18$ ).

A possible reason for this finding is that predicting how markets react is a difficult task regarding agricultural commodities. It is not considered to be an “exact science.” If one was to watch virtually any business program or read a publication related to market forecasts, it would not be surprising to find conflicting views as to which direction a market is headed.

There are many variables that are involved in these forecasts and other unpredictable factors can influence these variables. In agriculture, one of the biggest factors that can influence crop prices is the weather. If one was able to accurately predict what growing countries would be struck by drought conditions and which ones would encounter torrential flooding, then predicting market prices would be simplified, but they would not be necessarily simple.

Another factor that is difficult to predict is political unrest and how it can influence commodity prices. Unrest in the Middle East region has caused oil prices and

subsequently fuel prices to rise dramatically. This price increase has caused inputs to rise significantly for farmers. Producers are now faced with the decision whether to grow crops that require nitrogen-rich fertilizer or those that do not. These types of decisions will eventually influence market prices due to the supply and demand of agricultural commodities.

The researcher recommends that the LSU AgCenter and other land-grant institutions continue to do research in the area of economics that will assist producers in making decisions based on current market conditions and long-term trends in agriculture. By alerting farmers as to what world stocks are in specific commodities and what trends may be occurring, producers can make informed decisions. These decisions may not always be the correct ones, but they are supported by data and reason rather than guesswork.

9. Mass media sources are not a preferred information source for agronomic crop producers and consultants.

This conclusion is based on the findings that mass media sources were predominately in the bottom half of the rankings for perceived usefulness, frequency of use and preference for use for agronomic crop producers regarding information for growing agronomic crops. For crop consultants, mass media sources were predominately in the bottom half of the rankings for being a preferred source for cultural practices, crop variety selection and pest management issues.

For perceived usefulness, the mass media sources of the World Wide Web/Internet ( $M=3.07$ ,  $SD=1.14$ ), print publications/periodicals ( $M=3.02$ ,  $SD=.96$ ), print mass media ( $M=2.51$ ,  $SD=.99$ ) and broadcast media (radio and television) ( $M=2.33$ ,  $SD=.96$ ) ranked sixth, seventh, ninth and tenth for perceived usefulness by agronomic

crop producers. Three sources were considered “Moderately useful.” One source was considered only “Slightly useful.”

For perceived frequency of use, the mass media sources of the print publications/periodicals ( $M=3.11$ ,  $SD=.94$ ), World Wide Web/Internet ( $M=3.05$ ,  $SD=1.13$ ), print mass media ( $M=2.55$ ,  $SD=.99$ ) and broadcast media (radio and television) ( $M=2.34$ ,  $SD=.97$ ) ranked sixth, seventh, ninth and tenth for perceived frequency of use by agronomic crop producers. Three sources were used “Sometimes.” One source was used only “Rarely.”

When examining the cumulative scores across four components of agronomic crop production, the mass media sources of the World Wide Web/Internet ( $M=2.93$ ,  $SD=1.13$ ), print publications/periodicals ( $M=2.80$ ,  $SD=.93$ ), print mass media ( $M=2.38$ ,  $SD=1.00$ ) and broadcast media (radio and television) ( $M=2.21$ ,  $SD=.97$ ) ranked sixth, seventh, ninth and tenth for perceived overall preference for use by agronomic crop producers. Two sources were considered “Moderately preferred,” and three sources were considered “Slightly preferred.”

For crop consultants, the cumulative scores across three components of agronomic crop production yielded scores predominately in the bottom half of the rankings for mass media sources. The only source outside the bottom half was the World Wide Web/Internet ( $M=3.06$ ,  $SD=1.17$ ). It was ranked fifth. The other mass media sources, print publications/periodicals ( $M=2.58$ ,  $SD=1.14$ ), print mass media (newspapers) ( $M=1.61$ ,  $SD=.82$ ) and broadcast media (radio and television) ( $M=1.40$ ,  $SD=.71$ ) were ranked sixth, eighth and ninth respectively.

Previous studies by Risenberg and Obel Gor (1989) and Suvedi, Campo, & Lapinski, (1999) echo the ineffectiveness of mass media efforts in agriculture. These

studies indicated that mass media was not as effective as other methods such as personal contacts and visits, field days and on-farm tours. However, the same studies stated that the effectiveness of mass media increased based on certain variables such as farm size, education and age.

Risenberg and Obel Gor (1989) found that publications ranked third in preference as an information source for farmers in Nez Perce County, Idaho. However, the next two highest mass media sources ranked eighth and ninth. The researchers did find that younger farmers, more educated farmers, and individuals who farmed large acreages were more receptive to mass media outlets.

Suvedi, Campo, and Lapinski, (1999) found that mass media sources lagged behind extension-related print material and personal visits. Mass media sources were the fourth-highest rated source. They found that the audiences can vary on preferred sources of information based upon a variety of variables. Some of these variables are again farm size, farm income, age, off-farm employment and education.

Mass media sources again lagged as an information source for the 2002 Farm Bill for a Texas agricultural audience (Catchings, Wingenbach, & Rutherford, 2005). Regional newspapers were the highest-rated source, and they were ranked sixth out of 15 possible sources.

A study that contradicted these findings was Ruth and Lundy (2004). This study found that Florida opinion leaders were reliant upon mass media sources for information related to agricultural issues. It found that newspapers followed by television were the two most important sources. Radio was the fourth-rated source. The authors noted that since the individuals were opinion leaders, this group was less likely to be engaging in personal contacts for information.

Based on the findings, the researcher recommends that the mass media should not be the primary information source in informational campaigns, especially if the information is related to specific components of agronomic crop production. Mass media campaigns have shown some success in alerting individuals about important or new concepts. Boone and Zenger (2001) and Licht and Martin (2006) showed mass media channels can be effective and efficient means for increasing basic awareness and knowledge of a concept.

Licht and Martin (2006) also found that farmers use multiple channels for information. The authors suggested that multiple methods be used, and personal consultations should be one of the methods for delivering information.

To successfully reach an extension audience, Suvedi, Campo, and Lapinski (1999) suggested that an analysis should be performed on the target audience in the early stages of informational campaign. Characteristics of the audience that should be examined include farm size, farm income, age, off-farm employment, and education.

The researcher recommends that further research be conducted examining why agricultural producers are less reliant on the mass media for information. Research determining how much agricultural producers use the mass media could help explain why mass media is not relied upon as an important source. Factors such as trustworthiness of the mass media or the amount of information related to agriculture disseminated by mass media may be contributing to a low reliance by producers. Further research examining the attitudes of individuals involved in agriculture toward the mass media should be conducted. This research may reveal attitudes or beliefs that producers have toward the mass media which may be influencing their use of the mass media.

While the findings of this study indicated that producers and consultants do not use mass media sources as their preferred sources for obtaining information, these groups can use the mass media for informing the public about important issues related to production agriculture. The complexity of today's production agriculture is quite different from what it was 50 years ago. Soil fertility programs and pest management issues are much more intricate and require a greater understanding from previous generations of farmers. As the world's population continues to grow, greater demands will be placed on production agriculture systems across the globe.

By working with mass media, producers and consultants can inform the public about how safe the food produced in the United States is, how Americans pay a lower percentage of their income for food, and how farmers work at helping to conserve natural resources. In turn, the public will have a clearer picture of production agriculture and have a better awareness of how difficult a task it is to remain a viable farmer in today's agriculture. The mass media is an excellent source to convey these types of messages to a large audience.

10. Perceived accuracy and perceived awareness are important characteristics related to the usage of LSU AgCenter information by Louisiana agronomic crop producers.

This conclusion is based on the findings of the regression model that perceived accuracy and perceived awareness explained 29.1% of the variance in LSU AgCenter information usage by agronomic crop producers. Perceived accuracy explained 25.1% of the variance in the model, and perceived awareness explained the remaining 4.0% of the variance.

This finding indicated that accuracy of information is essential to Louisiana agronomic crop producers. Producers use information from various sources to produce their crops. To be successful growers, this information must be accurate. Information that is inaccurate can lead to a possible crop failure, yield loss or significantly higher input costs.

The researcher recommends that the LSU AgCenter continue to conduct sound research in agronomic crop production that will produce recommendations beneficial to producers. This information should be disseminated to growers through various sources, and the AgCenter should make this information in multiple formats. Information can be posted on the AgCenter's website, distributed via electronic newsletter or through local field days.

AgCenter personnel should use multiple methods for disseminating information, and they should alert their audiences that pertinent information is available via other sources or methods. Since awareness plays a significant factor in the usage of AgCenter information, personnel should alert individuals that needed information can be acquired in multiple manners.

The researcher recommends that further research be undertaken by the communications department to see if there are other factors that contribute to the usage of AgCenter information. For example, the type of crop being produced could be a factor. If a crop is unique to the area such as sugarcane in the southern part of the state, sugarcane growers may seek information differently than producers of other crops. Future studies should be conducted to see if there are geographical differences. These studies could compare one region of a state to another, or they could compare different regions of the United States to one another or even neighboring states. Tucker and Napier (2002) found

that producers in Iowa, Minnesota and Ohio had differences in preferences of information sources and alluded to factors such as familiarity with technology and education played a role.

Further research should examine the accessibility producers have to information sources, and the amount of time agricultural producers invest in acquiring information. By examining the efforts producers put into acquiring information and the methods that are available to them, organizations could have a clearer picture of how to develop information campaigns.



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**APPENDIX A**  
**PRESENTATION GIVEN TO AGRONOMIC CROP PRODUCERS AT THE**  
**GROWER MEETINGS**

Introduction Statement to Agronomic Crop Producers at Commodity Meetings

My name is Craig Gautreaux, and I am from the School of Human Resource Education and Workforce Development. I am conducting a study of how agronomic crop producers acquire information.

Information is one of many tools used to grow a successful crop. This study is seeking to determine what information sources are used by producers and what their preferred methods for receiving information are. The findings of this study will help identify the quickest and most efficient ways to get the information that each of you need to grow a successful crop. By completing the survey, strategies by communicators and others can be implemented that will ensure everyone receives the latest information regarding the latest innovation related to making your operation the most profitable it can be.

This survey should take approximately 10 minutes to complete.

Participation in this survey is voluntary. Because there are no identifiers on the instrument, subject responses will be anonymous. By completing and returning the instrument, you are giving your consent to be a participant in the study. If you have any questions regarding this instrument, you may speak to me via phone at 225-776-9124.

As a way of thanking you for being a participant, as you pass in your completed instrument make sure you receive a ticket for a Cabelas gift card drawing. Thank you, and if there are no questions, I will now begin passing out the survey.

**APPENDIX B**  
**QUESTIONNAIRE FOR AGRONOMIC CROP PRODUCERS**

## Perceptions of Information Sources

*1. Please indicate how often you use the following information sources regarding decisions related to operations on your farm by checking the appropriate answer:*

	Never	Rarely	Sometimes	Often	Always
Agricultural salespersons/representatives					
Broadcast media (radio and television)					
Crop consultants					
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)					
LSU AgCenter personnel (county agents, researchers)					
LSU AgCenter print materials					
Other agronomic crop producers					
Print mass media outlets (newspapers)					
Print publications/periodicals/magazines					
World Wide Web/Internet					

*2. How useful is the information regarding crop production from the following sources when making decisions regarding agronomic crop production?*

	Not At All Useful	Slightly Useful	Moderately Useful	Highly Useful	Extremely Useful
Agricultural salespersons/representatives					
Broadcast media (radio and television)					
Crop consultants					
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)					
LSU AgCenter personnel (county agents, researchers)					
LSU AgCenter print materials					
Other agronomic crop producers					
Print mass media outlets (newspapers)					
Print publications/periodicals/magazines					
World Wide Web/Internet					

3. Some key aspects to agronomic crop production include “cultural practices,” “pest management issues,” and “market issues.” For each of these aspects, please rate the identified information sources (i.e. crop consultants, other farmers, etc.) on the degree to which you prefer to use that source for information related to agronomic crop production.

**Cultural Practices (seeding rates, fertilization, field preparation, etc.)**

	Not Preferred	Slightly Preferred	Moderately Preferred	Highly Preferred	Extremely Preferred
Agricultural salespersons/representatives					
Broadcast media (radio and television)					
Crop consultants					
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)					
LSU AgCenter personnel (county agents, researchers)					
LSU AgCenter print materials					
Other agronomic crop producers					
Print mass media outlets (newspapers)					
Print publications/periodicals/magazines					
World Wide Web/Internet					

**Crop Variety Selection**

	Not Preferred	Slightly Preferred	Moderately Preferred	Highly Preferred	Extremely Preferred
Agricultural salespersons/representatives					
Broadcast media (radio and television)					
Crop consultants					
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)					
LSU AgCenter personnel (county agents, researchers)					
LSU AgCenter print materials					
Other agronomic crop producers					
Print mass media outlets (newspapers)					
Print publications/periodicals/magazines					
World Wide Web/Internet					

**Pest Management Issues (insect/entomological, plant diseases, weed control, etc.)**

	Not Preferred	Slightly Preferred	Moderately Preferred	Highly Preferred	Extremely Preferred
Agricultural salespersons/representatives					
Broadcast media (radio and television)					
Crop consultants					
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)					
LSU AgCenter personnel (county agents, researchers)					
LSU AgCenter print materials					
Other agronomic crop producers					
Print mass media outlets (newspapers)					
Print publications/periodicals/magazines					
World Wide Web/Internet					

Market Issues (selling and buying commodities)	Not Preferred	Slightly Preferred	Moderately Preferred	Highly Preferred	Extremely Preferred
Agricultural salespersons/representatives					
Broadcast media (radio and television)					
Crop consultants					
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)					
LSU AgCenter personnel (county agents, researchers)					
LSU AgCenter print materials					
Other agronomic crop producers					
Print mass media outlets (newspapers)					
Print publications/periodicals/magazines					
World Wide Web/Internet					

4. The LSU AgCenter offers information specifically for use in the production of agronomic crops. How aware are you of the following information sources offered by the AgCenter? Please indicate your answer by checking the appropriate box.

	Not At All Aware	Slightly Aware	Somewhat Aware	Highly Aware	Extremely Aware
LSU AgCenter Website (lsuagcenter.com)					
Research publications (Louisiana Agriculture magazine, Louisiana Ag Summary, fact sheets, etc.)					
Parish extension office/extension agents					
Area research stations personnel					
LSU AgCenter newsletters/publications (electronic or print)					
LSU AgCenter radio and television news segments					

5. Please indicate how often you use AgCenter information regarding each of the following aspects of agronomic crop production:

	Never	Rarely	Sometimes	Often	Always
Cultural practices (seeding rates, fertilization, field preparation, etc.)					
Crop variety selection					
Pest management issues (insects/entomological, plant diseases, weed control, etc.)					
Market issues (selling and buying commodities)					

6. It is important that information regarding the production of agronomic crops is accurate. Please rate the accuracy of each of the following AgCenter sources:

	Not At All Accurate	Somewhat Accurate	Moderately Accurate	Highly Accurate	Extremely Accurate
LSU AgCenter Website (lsuagcenter.com)					
Research publications (Louisiana Agriculture magazine, Louisiana Ag Summary, fact sheets, etc.)					
Parish extension office/extension agents					
Area research stations personnel					
LSU AgCenter newsletters/publications (electronic or print)					
LSU AgCenter radio and television news segments					

7. Are there any comments that you would like to make regarding how you receive or use information in your operation that may be important to this study?

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## Personal Information

- What is your age as of your last birthday? \_\_\_\_\_
- What is your gender? (check one) \_\_\_\_\_ Male \_\_\_\_\_ Female
- Are you of Hispanic, Latino, or Spanish origin? \_\_\_\_\_ Yes \_\_\_\_\_ No
- What is your race? (check one)
  - \_\_\_\_\_ African American/Black \_\_\_\_\_ American Indian \_\_\_\_\_ Asian
  - \_\_\_\_\_ Caucasian/White \_\_\_\_\_ Hawaiian/Pacific Islander
  - \_\_\_\_\_ Other (please specify) \_\_\_\_\_
- How many acres of the following crops do you grow? (Please respond for each crop you grow.)
  - \_\_\_\_\_ corn \_\_\_\_\_ cotton \_\_\_\_\_ milo/grain sorghum \_\_\_\_\_ rice
  - \_\_\_\_\_ soybeans \_\_\_\_\_ sugarcane \_\_\_\_\_ sweet potatoes \_\_\_\_\_ wheat
- What is the percentage of your income derived from farming the above-mentioned agronomic crops?
  - \_\_\_\_\_ 1-25% \_\_\_\_\_ 26-50% \_\_\_\_\_ 51-75% \_\_\_\_\_ 76-100%
- How many acres is your entire farming operation (including fallow ground)? \_\_\_\_\_
- How many years have you been producing agronomic crops? \_\_\_\_\_
- What is the highest level of education you have completed? (Check one)
  - \_\_\_\_\_ Less than high school \_\_\_\_\_ High school graduation or GED
  - \_\_\_\_\_ College degree \_\_\_\_\_ Advanced degree (master's or doctorate)
  - \_\_\_\_\_ Technical college/school, business school, some college or associate degree

**APPENDIX C**  
**COVER LETTER FOR CROP CONSULTANTS REQUESTING THEIR**  
**PARTICIPATION IN THE ELECTRONIC SURVEY**

My name is Craig Gautreaux, and I am a doctoral student with the LSU School of Human Resource Education and Workforce Development. I am conducting a study to help determine the preferred information sources of Louisiana crop consultants and their preferred methods for receiving information. Later this week, you will receive an electronic survey. The survey should take no more than 10 minutes to complete. All those that complete the survey are eligible for a drawing with the winner receiving a \$100 Cabela's gift card.

You are receiving this e-mail because you are a member of the Louisiana Agricultural Consultants Association. Denise Wright, LACA executive director, was supportive of this project and provided me with e-mail addresses with the stipulation I would only use the e-mail list-serv for this cause.

I would greatly appreciate you taking the time to fill out the survey.

Sincerely,

Craig Gautreaux

## APPENDIX D QUESTIONNAIRE FOR CROP CONSULTANTS

### Perceptions of Information Sources

Please indicate how often you use the following information sources to acquire information related to your consulting operation.

	N e v e r	R a r e l y	S o m e t i m e s	O f t e n	A l w a y s
Agricultural salespersons/representatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadcast Media (radio and television)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter personnel (county agents, researchers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter print materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other agronomic crop producers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other crop consultants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print mass media outlets (newspapers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print Publications/periodicals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
World Wide Web/Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How useful is the information you obtain from the following sources with regard to your consulting operation?

	Not at all useful	Slightly useful	Moderately useful	Highly useful	Extremely useful
Agricultural salespersons/representatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadcast Media (radio and television)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter personnel (county agents, researchers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter print materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other agronomic crop producers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other crop consultants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print mass media outlets (newspapers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print Publications/periodicals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
World Wide Web/Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Some key aspects in agronomic crop production include “cultural practices,” “pest management issues,” and “crop variety.” For each of these aspects, please rate the identified information sources (i.e. crop consultants, farmers, etc.) on the degree to which you prefer to use that source for information related to agronomic crop production.

Cultural Practices (seeding rates, fertilization, field preparation, etc.)

	Not preferred	Slightly preferred	Moderately preferred	Highly preferred	Extremely preferred
Agricultural salespersons/representatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadcast media (radio and television)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter personnel (county agents, research personnel, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter print materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other agronomic crop producers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other crop consultants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print mass media outlets (newspapers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print publications/periodicals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
World Wide Web/Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Crop Variety Selection

	Not preferred	Slightly preferred	Moderately preferred	Highly preferred	Extremely preferred
Agricultural salespersons/representatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadcast media (radio and television)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter personnel (county agents, research personnel, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter print materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other agronomic crop producers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other crop consultants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print mass media outlets (newspapers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print publications/periodicals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
World Wide Web/Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Pest Management Issues (insect/entomological, plant diseases, weed control, etc.)

	Not preferred	Slightly preferred	Moderately preferred	Highly preferred	Extremely preferred
Agricultural salespersons/representatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broadcast media (radio and television)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial advisors (i.e. loan officers, market managers, bank representatives, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter personnel (county agents, research personnel, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter print materials	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other agronomic crop producers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other crop consultants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print mass media outlets (newspapers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Print publications/periodicals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
World Wide Web/Internet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The LSU AgCenter offers information specifically for use in the production of agronomic crops. How aware are you of the following information sources offered by the AgCenter? Please indicate your answer by checking the appropriate box.

	Not at all aware	Slightly aware	Somewhat aware	Highly aware	Extremely aware
LSU AgCenter Website (lsuagcenter.com)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research publications (Louisiana Agriculture magazine, Louisiana Ag Summary, fact sheets, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parish extension office/extension agents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Area research station personnel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter newsletters/publications (electronic or print)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter radio and television news segments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate how often you use AgCenter information regarding each of the following aspects of agronomic crop production:

	N e v e r	R a r e l y	S o m e t i m e s	O f t e n	A l w a y s
Cultural practices (seeding rates, fertilization, field preparation, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crop variety selection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pest management issues (insects/entomological, plant diseases, weed control, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Market issues (selling and buying commodities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

It is important that information regarding the production of agronomic crops is accurate. Please rate the accuracy of each of the following AgCenter sources.

	Not at all accurate	Somewhat accurate	Moderately accurate	Highly accurate	Extremely accurate
LSU AgCenter Website (lsuagcenter.com)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Research publications (Louisiana Agriculture magazine, Louisiana Ag Summary, fact sheets, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parish extension office/extension agents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Area research station personnel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter newsletters/publications (electronic or print)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSU AgCenter radio and television news segments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are there any comments that you would like to make regarding how you receive or use information in your operation that may be important to this study?

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Personal Information

What is your age as of your last birthday?

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What is your gender?

- Male
- Female

Are you of Hispanic, Latino or Spanish origin?

- Yes
- No

What is your race? (check one)

- African American/Black
  - American Indian
  - Asian
  - Caucasian/White
  - Hawaiian/Pacific Islander
  - Other, please specify
- 

Check each of the crops below in which you provide consulting services.(Check all that apply.)

- Corn
- Cotton
- Milo/grain sorghum
- Rice
- Soybeans
- Sugarcane
- Sweet potatoes
- Wheat

How long in years have you provided consulting services to agronomic crop producers?

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Approximately how many total acres per year do you have under contract for your consulting services?

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What is the highest level of education you have completed? (Check one)

- Less than high school
- High school graduation or GED
- Technical college/school, business school, some college or associate degree
- College degree
- Advanced degree (master's or doctorate)

Thank you for completing the survey. The information gained from this study will be helpful in developing effective communication strategies for interacting with those involved with agriculture and crop consulting. Also, you are now entered for a drawing with the winner receiving a Cabela's gift card. You will be notified via e-mail if you are the winner. Thanks again for your valuable input.

## VITA

The author was born September 16, 1965, to the parents of Kenny and Sally Gautreaux, in Baton Rouge, Louisiana. He attended elementary school in Baton Rouge and Green River, Wyoming. He attended high school at Redemptorist High School in Baton Rouge and graduated in May 1983.

Upon graduation he entered Louisiana State University in August 1983. He graduated from Louisiana State University in December of 1987 with a Bachelor of Arts and Science degree in secondary education. In 1989 he began work on his Master of Journalism degree at Louisiana State University. He completed this degree in August of 1992.

In August 1992 he began working at Louisiana Public Broadcasting as an associate producer in Baton Rouge, Louisiana. In September 1997, he was promoted to producer. In August 1998 he began working for the LSU AgCenter as an associate communication specialist. On July 1, 2004, he was promoted to assistant communication specialist. On July 1, 2010, he was promoted to communication specialist.

On June 14, 1991, he married Monique “Niki” Banta. They became proud parents of a daughter, Alexandra Nicole, on April 10, 1994. Their second daughter, Juliette Elie, was born on March 1, 2001.

During 2004, he began his doctoral program in the School of Human Resource Education and Workforce Development and is now a candidate for a doctorate.