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# Secondary school agricultural teachers understanding of the differences between agricultural awareness and agricultural literacy in Iowa

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**Secondary school agricultural teachers understanding of the differences between  
agricultural awareness and agricultural literacy in Iowa**

by

**Ashley Nicole Eason**

A thesis submitted to the graduate faculty  
in partial fulfillment of the requirements for the degree of

**MASTER OF SCIENCE**

Major: Agricultural Education

Program of Study Committee:  
Robert Allen Martin, Major Professor  
Michael Steven Retallick  
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Iowa State University

Ames, Iowa

2014

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**DEDICATION**

Dedicated to my Husband Jarrett Eason and to my Parents David and Robin Batts Sr.

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**ABSTRACT**

The focus of this study was an assessment of the understanding of the concepts of agricultural awareness and agricultural literacy as perceived by agricultural education teachers. The purpose of this study was to identify perceptions of agriculture teachers regarding the understanding of the concepts of agricultural awareness and agricultural literacy in the study of agriculture in the state of Iowa. To also develop consensus definitions of agricultural awareness and agricultural literacy. Data provide information for development of a framework for education in and about agriculture and the life sciences. We can conclude from the study there is no consensus definition for agricultural awareness and agricultural literacy among agricultural educator teachers in Iowa. Since there is not a consensus definition for agricultural awareness and agricultural literacy, there is not a clear understanding of the two definitions. There needs to be consensus definition of agricultural awareness and agricultural literacy taught to agricultural educators at the collegiate level. There needs to be a consensus definition of agricultural awareness and agricultural literacy taught in the elementary, middle and high school, and agricultural programs such as FFA, 4H, and agricultural fairs. It is recommended that the Agricultural Awareness and Literacy Framework Model that was developed in 2008, should be used in both formal and non-formal educational settings. The course curricula at a formal educational institution can be designed in such ways that they impart the interest in agriculture at the elementary level and knowledge and expertise at high school and post-secondary levels, respectively. If knowledge is imparted by the time students leave the high school, they can make informed decisions regarding careers and their concerns about food and their environment.



## **CHAPTER 1 INTRODUCTION**

Agriculture has been very important for the United States and has “fed, clothed, and provided building materials for millions of Americans” (p.63) and people of other countries (Harris & Birkenholz, 1996). America’s food and fiber systems determine the general welfare of its public (Leising, Pense, and Portillo, 2003). According to the National Research Council (1988), much of the American general public is unaware of where and how the food they eat is produced. In addition, many people are not aware of the career opportunities in the food and natural resource industry. This information indicates the need for educating people about agriculture. In order to achieve this goal, it is important to determine what constitutes agricultural awareness and agricultural literacy.

“The knowledge and perception of agriculture held by students and adults...” is referred to as agricultural literacy (Wright, Stewart, & Birkenholz 1994). In order to find a consensus definition for agricultural literacy, Frick, Kahler, and Miller (1991) surveyed 78 professionals from all over the United States and defined agricultural literacy as “... possessing knowledge and understanding of our food and fiber system. An individual possessing such knowledge would be able to synthesize, analyze, and communicate basic information about agriculture” (p.52)

### **Statement of the Problem**

Agricultural knowledge systems play a central role in developing and disseminating knowledge, information and technologies relevant to improving global food security and environmental sustainability (Acker, 1999). Basic agricultural knowledge includes: production of plant and animal products, the economic impact of agriculture, its societal significance, agriculture’s important relationship with natural resources and the environment, the marketing and processing of agricultural products, public agricultural policies, the global significance of

agriculture, and the distribution of agricultural products (Balschweid, Thompson, and Cole, 1997)

The notion of agricultural literacy, since its inception, has been based on the premise that every person should possess a minimum level of knowledge of the industry, which produces and markets food needed for human survival. Consumers, as well as policy makers, need to be “agriculturally literate” in order to respond appropriately as issues arise (Frick, Birkenholz, and Machtmes, 1995). To address the problem of society, which has become increasingly illiterate (in an agricultural sense) with each passing generation (Birkenholz, 1990), there was a need to assess the knowledge and perceptions of selected United States citizens regarding agriculture, food, and food production.

Although agricultural literacy and agricultural awareness are closely related, the term agricultural awareness was used for this study and was conceptualized as “experiencing or exploring agriculture as it relates to the subject matter being studied or context of life being lived; the ability to identify the connections of agriculture to areas of study or life” (Knobloch, 1997, p.12)

Knobloch and Martin (2002) underscored the need for agricultural awareness while linking the philosophical basis for agricultural literacy to Dewey’s early philosophy on experiential learning (Pense, Leising, Portillo, and Igo, 2005).

Perhaps a greater problem is that many people perceive agriculture as only farming and ranching. This perception is evident in children. Elementary school children interpret the industry as the farmer, the cow, the tractor, the rancher, and many other stereotypes (DeWerff, 1989). Many times children have the idea that food simply comes from the store (Blackburn, 1999).

Swan and Donaldson (1970) pointed out that many misconceptions existing about farms, plants, animals, and other aspects of agriculture and life can be corrected when children are taught about agriculture. The AgriFood Education Program of the Texas A&M University Agriculture Program is trying to combat those misconceptions. The mission is to provide experiential and outdoor learning events on agriculture, natural resources, biotechnology, food, and environmental topics (Blackburn, 1999).

### **Purpose of the Study**

The purpose of this study was to describe selected secondary agricultural teachers perceptions of agricultural awareness and literacy in the state of Iowa. Review of literature indicated that the terms agricultural awareness and agricultural literacy mean different things to different people.

The objectives of this study were to:

1. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness.
2. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural literacy.
3. Identify the demographic characteristics of secondary agriculture teachers in Iowa.
4. Develop consensus definition of agricultural awareness.
5. Develop consensus definition of agricultural literacy.

### **Research Questions**

The four principal research questions that are presented to frame specific exploratory questions for this study were:

1. What are the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness?
2. What are the perceptions of secondary agricultural teachers regarding the definition of agricultural literacy?
3. What is the consensus definition of agricultural awareness?
4. What is the consensus definition of agricultural literacy?

### **Significance of the Study**

The focus of this study was an assessment of the understanding of the concepts of agricultural awareness and agricultural literacy as perceived by agricultural teachers. Researchers have found that teachers with agricultural experience had more agricultural knowledge and more accurate perceptions (Terry, Herring, and Larke, 1992; Humphrey, Stewart, and Linhardt, 1994) (KM, 2000). While it may be difficult for the general public to define the term “agricultural literacy” or “agricultural awareness,” private foundations and government agencies have financially supported the idea that there is a need for the general public to have a basic understanding of agriculture, the agricultural industry, and its importance to our country and citizens (Frick, 1990). The entire agricultural awareness and agricultural literacy issue is critical and needs to be taken seriously by agricultural and educational leaders at every level (Knobloch and Martin, 2000).

### **Definition of Terms**

1. Agricultural Education Teacher: Teachers at the secondary school level (urban and rural) who teach curriculums related to the agricultural sciences.
2. Agricultural knowledge includes: production of plant and animal products, the economic impact of agriculture, its societal significance, agriculture's important relationship with natural resources and the environment, the marketing and processing of agricultural products, public agricultural policies, the global significance of agriculture, and the distribution of agricultural products (Balschweid, Thompson, and Cole, (1997)
3. Agricultural literacy: Having “an understanding of the food and fiber systems, including the history and current economic, social, and environmental significance to all Americans” (Malecki, 2004; Regents University of California, 2001; Kurth, 1997)
4. Consensus: General agreement or concord; harmony
5. Educational delivery systems: Set of instructional methods or procedures used to transfer knowledge of a program, product, technology, or service to the public (Business Dictionary, 2008 Martin, 1991).
6. Perception: A process that involves the senses and enables individuals to arrive at true beliefs about their environment (Coats, 1998).

## **CHAPTER 2 REVIEW OF THE LITERATURE**

The purpose of this study was to identify perceptions of agriculture teachers regarding the understanding of the concepts of agricultural awareness and agricultural literacy in the study of agriculture in the state of Iowa. The study sought to find a consensus definition of agricultural awareness and agricultural literacy so that secondary agriculture teachers can provide the students and the general public with the basic understanding of agriculture, the agricultural industry, and its importance to our country and citizens.

### **Historical Background of Agricultural Education**

Agricultural education is a systematic program of instruction available to students desiring to learn about the science, business, and technology of plant and animal production and/or about the environmental and natural resources systems. Agricultural education first became a part of the public education system in 1917 when the U.S. Congress passed the Smith-Hughes Act. Today, over 800,000 students participate in formal agricultural education instructional programs offered in grades seven-adult throughout the 50 states and 3 U. S. territories.

Agricultural education envisions a world where all people value and understand the vital role of agriculture, food, fiber, and natural resources systems in advancing personal and global well-being. Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems. Agricultural education instruction is provided at the local level through the nation's schools. State leadership is provided through various agencies and institutions including state departments of education, state departments of agriculture, land grant universities, community colleges, and other entities. The U. S. Department of Education provides federal leadership. All of the

agricultural education organizations have local, state, and national programs and activities. The umbrella organization for the agricultural education community is the National Council for Agricultural Education (The Council) (National FFA Organization).

### **Public Perceptions of Agricultural Awareness and Agricultural Literacy**

Men and women of all ages and ethnic groups have a vested interest in agriculture (Law & Pepple, 1990). Consumers as well as policy makers need to be "agriculturally literate" in order to respond appropriately as issues arise. Most Americans, whether young or old, have limited knowledge about agriculture and food production. Many would agree with the need for a basic understanding of agriculture, the agricultural industry, and its importance to our country and citizens. Mawby (1984, p. 72) noted that by "...educating Americans in the wise management of food supplies and related renewable resources, we can anticipate more knowledgeable decision-making about agriculture in the future" (Frick, Birkenholz, Gardner, and Machtmes, 1995).

Agricultural literacy is a concept founded on the premise that citizens of the United States should possess a basic understanding of the industry of agriculture. Teachers in elementary and secondary schools should be encouraged to develop a greater understanding of the importance and significance of agriculture in this country and the world. Instructional assistance should be provided through pre-service and in-service programs that could facilitate the use of agricultural examples in elementary and secondary school classes. Graduates of our secondary school systems should not be considered to have received a "well-rounded education" if they lack an understanding and appreciation of the significance of agriculture in their daily lives (Frick, Birkenholz, Gardner, and Machtmes, 1995).

It might also be concluded that more positive perceptions might result if the agricultural literacy knowledge level of United States citizens were to be enhanced. Recognizing the

relationship between agricultural knowledge and perceptions, it is hypothesized that programs directed toward the 30 plus percent of the knowledge responses, which were “incorrect”, or "don't know" would result in an even more positive perception of agriculture (Frick, Birkenholz, Gardner, and Machtmes, 1995).

Therefore, it was recommended that educational programs be first directed to address the agricultural knowledge that the targeted audience does not know rather than verifying the agricultural knowledge they do know (Frick, Birkenholz, Gardner, and Machtmes, K., 1995). The consuming public has little knowledge of where and how food is produced and consumer groups are raising questions about the safety of the food supply (National Research Council, 1988). In addition, media reports of food contamination and related illness have focused concern on the safety of the food supply. The level of knowledge about agricultural practices and related perceptions by U.S. consumers has created a concern about the quality and safety of our food supply (Birkenholz and Stewart, 1991).

The concern about the public perceptions about agriculture, food, and food production is not new. Hamlin (1962) noted that voters elect representatives who create farm policy and without knowledge, could be responsible for the demise of the agricultural industry. Others (Mayer & Mayer, 1974; Mawby, 1984; Nipp, 1988; National Research Council, 1988) have cited the importance of agriculture and the need for the public to be informed. “People make sense of literacy as a social phenomenon, literacy lies at the root of their attitudes. . .and their actions” (Barton, 1990, p. 7). Public policy affecting agriculture and society is directly affected by societal goals. These goals have been decided by people who have little knowledge about agriculture, how it relates to society, and its economic and global significance to our nation (Deavers, 1987; North Carolina State University, 1988; Nipp, 1988).



Townsend (1990) believed that a pre-secondary agricultural education program can build a positive attitude with students that will let them develop into positive leaders. Perritt and Morton (1990) believed that if you give younger students pre-secondary agriculture that you can develop a positive association with agriculture. They stated, "The younger you start them the better they will become" (p. 14), implying we should be incorporating agricultural literacy concepts into the curriculum early in the educational process. Kuempel and Spivey (1991) agreed with the concept of improving perceptions of agriculture programs by introducing agriculture classes to pre-secondary students and incorporating agriculture into academic courses (Wright, Stewart, and Birkenholz 1994).

Much attention has been given to the fact that the American society is "agriculturally ignorant." Coon and Cantrell (1985) pointed out that, "Today, the public's image of agriculture is a kaleidoscope of leftover attitudes and images of what agriculture was in the '40's, '50's and early '60's" (p.22) (Terry and Lawver, 1995).

There are those people who believe it is vital that the general public have accurate perceptions about agriculture for several reasons. Agriculture is important because of its impact upon our society, the economy, the environment, and personal health. University students represent the next generation of policy-makers. Because most people in this country do not have to be concerned about the supply of high quality food and fiber, many fail to understand its benefits to our society (USDA, 1983).

This shift away from an agrarian society has created a population that has less experience and knowledge regarding agriculture. The need for public support of agriculture and the agricultural industry increases as fewer people become directly involved in production agriculture. Further, educational need arises from the inability of the American public to receive

agricultural knowledge from everyday experiences, as they would have in previous decades.

Terry and Lawver (1995) noted that it is vital for Americans to have an accurate understanding of agriculture because of agriculture's impact on society, the economy, and the environment (Meunier, Talbert, and Latour, 2002).

The need for agricultural education arises from the inability of the American public to receive agricultural knowledge from everyday experiences, as they would have in previous decades. Frick (1988) demonstrated the importance of agriculture's significance to society. He stated "agriculture significantly affects many facets of our society...our standard of living; the dimensions of world food needs; international trade; and employment opportunities" (p. 13). Dissemination of accurate agricultural information can be a cumbersome task if the term agricultural literacy is not clearly defined (Meunier, Talbert, and Latour, 2002).

Balschweid, Thompson, and Cole (1998) found classroom teachers felt the greatest barriers to implementing agriculture in classrooms were time to make the necessary curricular changes and locating agricultural materials and information. These barriers would be greatly lessened if teachers were agriculturally aware, meaning they possessed a better working knowledge of agriculture and agricultural practices. In this context, working knowledge refers to an understanding of basic information related to agriculture, such as crops, livestock, and agricultural products (Meunier, Talbert, and Latour, 2002).

### **Student Perceptions of Agricultural Awareness and Agricultural Literacy**

The decline in the number of students entering the field of agriculture has been on the rise over the years. As reported by the United States Department of Agriculture (1998), five major challenges face the U.S. agricultural industry in the next decade: (1) maintaining an agricultural system that's highly competitive in the global economy, (2) balancing agricultural production

and the environment, (3) providing a safe and secure food supply for all citizens, (4) maintaining a healthy, well-rounded population, and (5) increasing the number of people entering the field, economic opportunities and improving the quality of life for all Americans. Although the numbers of American farms have declined over the years, American farmers still provide enough food for the American people and much of the world (Scott and Lavergne, 2004).

On average, American consumers spend just 10 percent of their disposable income for food, which is lower than any other national in the world (American Farm Bureau, 2002). To sustain agriculture at its current status, recruitment of outstanding individuals must be enhanced. To enhance recruitment, more effective recruitment strategies must be implemented. To develop effective recruitment strategies, it is necessary to research students' decision-making processes and their images of agriculture (Lucas, 1993).

Concern has grown among leaders in the American agricultural community that they will face shortages of qualified workers in the future. Now that the nineties have arrived and after several years of declining student enrollment in their agriculture programs, state universities and land grant colleges are beginning to experience an increase at the bachelors level (FAEIS, 1990). Enrollments, however, continue to decline in master's and doctoral programs (RICOP, 1990) and also in agriculture programs at the secondary school level. (NFFAC, 1989; Cecchettini, Sommer, and Leising, 1992).

Mallory & Sommer (1986) suggest that these enrollment declines can be related to negative perceptions of careers in agriculture among high school students, as high school students were unaware of the range of career opportunities in agriculture and equated agriculture with farming alone. Orthel, Sorensen, Lierman, & Riesenber (1989) reached a similar conclusion--"The students perceive agriculture as farming and ranching only (p. 10)." Both

studies point to the limited perception high school students have of what constitutes the agricultural industry. (Cecchetti, Sommer, and Leising, 1992).

According to Foster and Henson (1992), the agricultural industry is the foundation for any society; however, in the United States, ethnic minorities' and women' involvement in agriculture is limited. Various demographic estimates indicate that ethnic minority populations are steadily increasing, and more of these students will need to be recruited into agriculture-related careers in order to sustain the agricultural industry for the future and to help ensure that the United States remains competitive in the global economy (Mitchell, 1993). In relation to these factors, the demand for agricultural graduates, in particular ethnic minorities, is high, but the supply is very low. Tally (1996) further believes that the lack of minority representation in the production and sale of agricultural commodities can be greatly attributed to traditional perceptions of agriculture (Alston and Crutchfield, 2009).

The traditional perception of agriculture "is a contributing factor to the current shortage and available supply of individuals with knowledge and expertise in the food and agricultural sciences (Thompson & Russell, 1993, p. 55)." People see agriculture as relevant to their daily lives with respect to what they eat and in how food is processed. They do not see the relevance of participating in agriculture as a career, particularly minority populations (Alston and Crutchfield, 2009).

"The decisions of individuals to select agriculture as a field of study or to become actively engaged in an agricultural career may be predicted by examining their beliefs about agriculture (Thompson and Russell, 1993, p. 55)." Studies have shown that minority youth do not participate in agricultural programs because of perceptual concerns regarding the industry.

Many minorities exhibit limited awareness of the science demands faced by students who want to prepare for professional careers in the food and agricultural sciences" (Wiley, Bowen, Bowen, and Heinsohn, 1997, p. 21).

Minority youths' perceptions of agriculture in urban areas differ from those in rural areas. White, Stewart, and Linhardt (1991) observed that inner city students believe persons working in agriculture should have an agricultural background, will work outdoors, have opportunity for advancement, and can learn the skills needed for employment on the job. They also agree that inner city students believe that career opportunities are available in many areas of agriculture, but they believe the greatest opportunity for jobs exist in engineering, education, Extension, food service and lodging management, and horticulture. There needs to be a heightened awareness of the urban population to the value of agriculture and agribusiness.

According to Cano and Bankston (1992), reaching and serving minority populations will require greater consideration in the future. Youth perceptions of agriculture have developed from parents, school administrators, and counselors. Thompson and Russell (1993) stated that groups with more positive beliefs and intentions towards agriculture are persons with formal education beyond high school and residents of large urban communities. Thompson and Russell (1993) perceived that high school students who have taken course work in agriculture expressed more favorable beliefs about agricultural careers and are more inclined to consider an agricultural area of study than those students without such exposure (Alston and Crutchfield, 2009).

Many students see agriculture in its narrow sense of interpretation: "the farmer; the cow, plow, and sow man; the wheat farmer and livestock rancher; and many other stereotypes" (p. 15). This problem is further complicated by the productivity of the land and population growth. The

combination of these factors means less land is needed for agriculture allowing the growth of residential areas. DeWerff concluded, “It is a small wonder that few Americans have an accurate understanding of modern agriculture” (p. 14 DeWerff, 1989)

### **Summary of Review of Literature**

It is evident that there is some confusion about the definition of the terms “agricultural awareness” and “agricultural literacy”. In addition, there has been little research conducted focused on the secondary educators’ understanding of agricultural awareness and literacy in the state of Iowa.

Agricultural literacy is defined as possessing knowledge and understanding of our food and fiber system. An individual possessing such knowledge would be able to synthesize, analyze, and communicate basic information about agriculture. Basic agricultural information includes the production of plant and animal products, the economic impact of agriculture, its societal significance, agriculture’s important relationship with natural resources and the environment, the marketing of agricultural products, the processing of agricultural products, public agricultural policies, the global significance of agriculture, and the distribution of agricultural products. Agricultural literacy describes the understanding and knowledge necessary to synthesize, analyze, and communicate basic information about agriculture. Agricultural literacy knowledge encompasses 11 broad agricultural subject areas which include: 1) agriculture’s important relationship with the environment, 2) processing of agricultural products, 3) public agricultural policies, 4) agriculture’s important relationship with natural resources, 5) production of animal products, 6) societal significance of agriculture, 7) production of plant products, 8) economic impact of agriculture, 9) marketing of agricultural products, 10) distribution of agricultural products, and 11) global significance of agriculture. The National Academy of Science (NAS)

Committee recommended that the curriculum of education about agriculture and education in agriculture be broadened. The 11 agricultural subject areas identified from this study can provide the framework for expanding agricultural education's curriculum (Frick, Kahler, and Miller, 1991).

There is no known official definition of agricultural awareness. After extensive research on the term awareness, it was found that awareness is having knowledge or knowing that a subject is in existence. Merriam-Webster defined awareness as having or showing realization, perception, or knowledge.

With agricultural awareness it is not required for you to fully understand the ins and outs of agriculture such as: the production of plant and animal products, the economic impact of agriculture, its societal significance, agriculture's important relationship with natural resources and the environment, the marketing of agricultural products, the processing of agricultural products, public agricultural policies, the global significance of agriculture, and the distribution of agricultural products. However, agricultural awareness does require a person to have basic interest and attraction to a topic in agriculture. This interest may be temporary and more than likely not transferable to new situations over the long term.

At times agricultural awareness and agricultural literacy terms may be intertwined and interchangeable which causes a misunderstanding among the public when it comes to understanding agricultural awareness and agricultural literacy. Having a common definition and understanding of the two terms would help focus the course content for imparting agricultural education to not only students but also to the public. In addition, teaching methods and strategies can be designed effectively if there is a consensus understanding of the two terms.

**CHAPTER 3**  
**METHODOLOGY**  
**Purpose**

The purpose of this descriptive cross-sectional survey design research study was to determine perceptions of all secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy in Iowa.

The objectives of this study were to:

1. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness.
2. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural literacy.
3. Identify the demographic characteristics of secondary agriculture teachers in Iowa.
4. Develop consensus definition of agricultural awareness.
5. Develop consensus definition of agricultural literacy.

This chapter contains the following sections: phase one of the study, audience of the study, research design, target population and sampling frame, instrumentation, sample design, survey mode and data collection, data processing and post collection, assumptions of the study, and limitations/delimitations.



## **Prior Research of Professional Educators Perceptions of Agricultural Awareness and Literacy**

During a summer internship through the George Washington Carver program in 2008, research was completed on the focus of the Professional Educators Understanding of Agricultural Awareness and Literacy. This study was an assessment of the understanding of the concepts of agricultural awareness and agricultural literacy as perceived by agricultural teachers, adult educators, and leaders in the industry. Data provide information for development of a framework for education in and about agriculture and the life sciences. The study found that there was no common understanding of the terms agricultural awareness and agricultural literacy and the definitions differed among the respondents. It was evident that there was some confusion about the definition of the terms “agricultural awareness” and “agricultural literacy”.

The purpose of this study was to describe selected professional educators’ and industry leaders’ understanding of agricultural awareness and literacy. Review of the literature indicated that the terms agricultural awareness and agricultural literacy mean different things to different people. A secondary purpose was to identify best practices used to promote agricultural awareness and literacy in agriculture. In addition, there had been little research conducted focused on the educators’ and industry leaders’ understanding of agricultural awareness and literacy in the state of Iowa.

Descriptive statistics were used to analyze the data. Data were analyzed using Microsoft® Excel® 2007 version. Eight (62%) of the respondents were male and five (38%) were female. The sample consisted of seven (54%) agriculture teachers representing different schools of Iowa, two (16%) commodity board professionals, and two (15%) Iowa State University extension professionals and two Iowa State University staff involved in educating clients (15%). Nine (69%) of the professionals had a Bachelor’s degree, three (23%) had a Master’s degree, and one

(8%) had a doctoral degree. All the professionals grew up on farms. The understanding of the terms agricultural awareness and literacy varied among the respondents.

The common theme that emerged from the interviews was that an overwhelming majority of the participants (92%) felt that the terms “agricultural awareness and agricultural literacy” are different but the definitions of the terms differed among the respondents. Only one (8%) participants stated that both the terms are meshed together and it is difficult to differentiate them. The common understanding of the majority of the respondents was that agricultural awareness is a shallow understanding of the concepts, whereas agricultural literacy was a deeper understanding of the concepts. They expressed that agricultural awareness is a basic interest toward the subject, whereas agricultural literacy is a higher level of understanding of the concepts. It was interesting to note that the definitions and examples the participants gave for the terms differed greatly among the respondents.

The respondents listed some activities they do in their job, which they felt are useful in imparting awareness and literacy relative to agriculture to their clients. Some of the activities listed by the respondents under the agricultural awareness category were Food for America program, petting zoo, farm safety day, Grow Cabbage program, Iowa State fair, pork information gateway program, websites, and use of mass media. Some of the activities that were listed under the agricultural literacy category were state 4-H conference, FFA activities, SAE activities, pork information gateway program, websites, and mass media. It is interesting to note that some activities were listed under both the categories. The respondents said that they would use different approaches under the same activities to impart awareness and literacy relative to agriculture depending on the level of cognition and interest of the client. The results from this study resulted in developing a framework for agricultural awareness and literacy (Fig 1), which

can be used by the educators in identifying the stage of the client and imparting awareness and literacy, as the case may be.

### **Agricultural Awareness and Literacy Framework**

Based on the results of the previous study and the review of literature, an '*Agricultural Awareness and Literacy Framework*' was developed. This framework depicts five stages in an ascending order based on the level of cognition of the characteristics associated with each stage. The characteristics associated with each stage were developed based on Bloom's taxonomy. These characteristics either lead to the particular stage or manifest themselves as a result of the stage. The stages are listed below:

1. Being aware of agriculture – Having a basic interest or attraction to the subject.
2. Being informed about agriculture – Gaining familiarity and basic knowledge of the subject
3. Being literate about agriculture – Comprehending concepts and principles
4. Being educated in agriculture – Applying and analyzing knowledge and skills.
5. Being an agricultural educator – Synthesizing and sharing, facilitating learning.

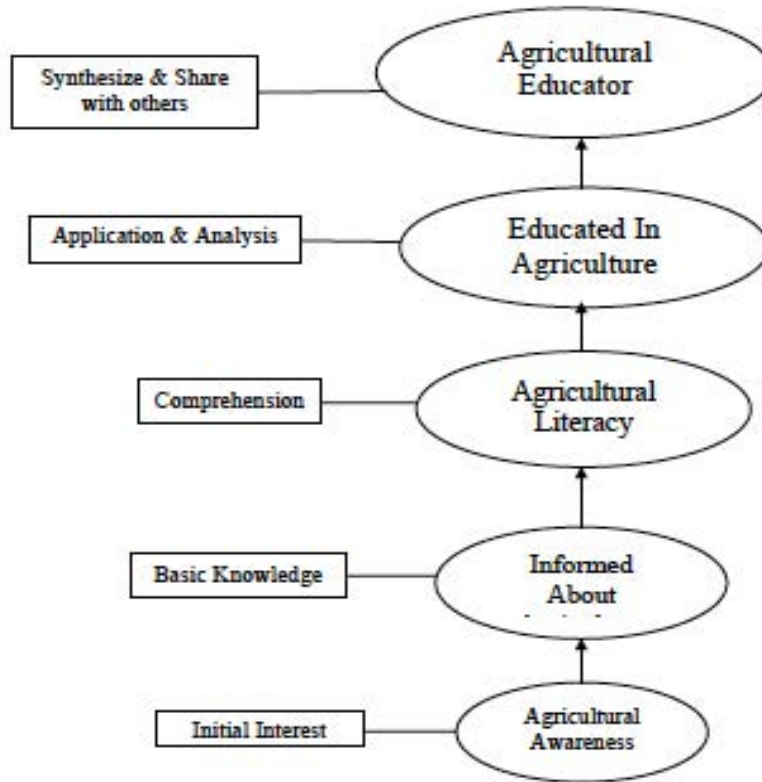
The '*Agricultural Awareness and Literacy Framework*' depicts awareness as the first stage in the process of education relative to agriculture and this process ends when a person reaches a stage where he/she becomes an agricultural educator. This framework suggests that one needs to have a basic interest in order to become aware of a topic or exposure to a topic may also arouse interest. This awareness will lead to seeking of more information relative to that topic. This action results in education about agriculture where a person is knowledgeable. This stage leads to the agricultural literacy stage that is characterized by comprehension skills. These skills may lead a person to be educated in agriculture through a formal educational program. This stage

is characterized by application and analytical skills. This is a higher order cognitive skill according to Bloom's taxonomy. The final stage is becoming an agricultural educator. An educator possesses synthesizing skills. At this stage, the person will be sharing information and educating others about and in agriculture. The educator may be educating people who are situated at different stages depicted in this framework. This framework identifies the stages from being aware to being an educator as linear or sequential.

It was recommended that this framework be used to arrive at a consensus definition for the terms 'agricultural awareness' and 'agricultural literacy'. This model is applicable to both formal and non-formal educational settings. The course curricula at a formal educational institution can be designed in such ways that they impart the interest in agriculture at the elementary level and knowledge and expertise at high school and post-secondary levels respectively. If knowledge is imparted by the time students leave the high school, they can make informed decisions regarding careers and their concerns about food and their environment.

In non-formal educational settings like adult and extension education, the stages as depicted in the framework can be used by educators in identifying the stage the client is in, as depicted in this framework, and make a decision on what skills need to be imparted to the client. The teaching methods and aids may also be designed based on the stage to be served. Therefore, using this framework the definitions of "agricultural awareness" and "agricultural literacy" can be differentiated and used to more precisely identify the need for education about and in agriculture called for in the situation.

Agricultural Awareness and Literacy Framework



*Fig 1. Agricultural Awareness and Literacy Framework*

### Population of the Study

The population of the study consisted of secondary agriculture education teachers in Iowa who were procured from the 2010-2011 Iowa State Department of Education. The census study consisted of 195 agriculture education teachers from Iowa.

### **Research Design**

The purpose of this descriptive cross-sectional survey design research study was to determine perceptions of all secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy in Iowa. Measurement error can be a threat to internal validity in this study, which would be minimized by adopting a valid and reliable questionnaire to collect data. This study was a census study.

The target population for this study consisted of all agriculture teachers in the state of Iowa. A list of the potential participants was procured from the Iowa State Department of Education.

To minimize the frame error, the list of the agricultural teachers was compared with the names from each staff directory as to not duplicate the teachers that are on the list.

### **Instrumentation**

The questionnaire approach to data collection was considered appropriate for this study because similar procedures have been successfully used by researchers (Cooper and Graham, 2001) to conduct similar studies. These questions were developed by a team of experts including faculty, staff, and graduate assistants in the department of Agriculture Educations and Studies at Iowa State University familiar with the subject and for face and content validity.

The questionnaire consisted of two parts: demographic and perception questions. The first part of the questionnaire had the demographic questions: highest educational level, gender, age, agricultural related jobs, and number of years of teaching agricultural education. The second part of the questionnaire had participants choosing between agricultural awareness or agricultural literacy to determine the true perceptions of agricultural awareness and agricultural literacy. Clear instructions were provided throughout the questionnaire to help potential respondents to better understand the procedures for their responses.

### **Survey Mode and Data Collection**

Following the approval for the study from the Institutional Research Board at Iowa State University, introductory letters containing the purpose of this study, potential usefulness, confidentiality, and consent details were sent to the participants via email and consent was assumed if they agreed to participate in the study. The introductory letter informed the potential respondents about their selection to participate in this study, which were voluntary and they could withdraw at any time during the study.

The code number on the questionnaire will be the same as the code number assigned to the subject and was used to identify respondents who would return their completed questionnaire. This provided (1) some degree of anonymity to the subjects, and (2) the researcher a method for installing follow-up procedures with non-respondents. Two weeks after emailing the initial packet, an email reminder was sent to non-respondents explaining that their response was important for this study. After this reminder, the third follow up was made, each in ten-day gaps. In the first follow up, a second complete email packet was sent to the non-respondent. In the second follow up, non-respondents were reminded by an email message, and by email in the third follow up. There were a total of four surveys sent to participants. Their response rate was calculated as a percentage of the total number of questionnaires emailed to all participants. Of the 195 surveys, 91 surveys (46 %) were returned. The researcher kept a logbook of all events that occurred throughout the data collection process.

### **Data Processing and Post-Collection**

Descriptive statistics was used to analyze the data from the study. Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 17.0. Descriptive statistical tools

that were used in the data analysis for this study are the mean, standard deviation, frequencies and percentages. Completed questionnaires served as a data source for the study.

An independent t-test was used to test the significance of perceptions between respondents and non-respondents. A level of significance was set at 0.05.

### **Pilot Test**

Face validity and reliability were established during the pilot study consisting of 20 Iowa secondary agriculture education teachers. Face validity according to Miller (1999a, p. 16) indicates that an instrument “look like” (according to the researcher’s respondent) it is measuring what it is suppose to measure. Twenty Iowa secondary agriculture teachers were emailed a preliminary survey on April 26, 2011, along with a cover letter explaining the purpose of the study. Teachers were asked to complete the survey; eleven surveys were received from this emailing. The final data set was used to determine the instrument’s reliability. The twenty-four statements items where respondents had to decide between agricultural awareness and agricultural literacy were tested for reliability by using the Cronbach’s Alpha. Reliability was found to have a Cronbach’s Alpha Reliability of .68. The instrument was found to be reliable.

### **Non-response Error**

Non-response error was addressed by comparing early respondents to late respondents. A chi-square of independence was performed to determine if there was a significant relationship between early and late respondents. The following variables were used: years teaching agriculture, age, gender, and highest level of education. The chi-square values were not significant ( $\alpha \leq .05$ ). There was no significant difference; therefore, because they were similar, generalization could be made. However, due to the low response rate of 46%, generalization was limited to those who responded to the survey.



### **Assumptions of the Study**

The following basic assumptions were made for the purpose of this study:

1. The participants in this study fully understood the purpose and objectives of this study.
2. The participants were honest and professional in their responses of their perceptions in the questionnaire.
3. The agriculture education teacher understood the questionnaire.
4. The agriculture education teachers would be truthful, honest, and objective when answering questionnaire.
5. The findings would be useful to agricultural educators' involved promoting agricultural awareness and agricultural literacy in agriculture.
6. A quantitative study was the best method to obtain the necessary information.

### **Limitations/Delimitations**

1. This study was limited to the secondary agricultural teachers of Iowa.
2. This study explored the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, however, people's perceptions may change, and therefore the findings may only be relevant to the period when data was collected for the study.
3. This study explored secondary agricultural teachers' level of education maintaining to their perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy.

**CHAPTER 4**  
**RESULTS AND FINDINGS OF THE STUDY**  
**Purpose of the Study**

The purpose of this study was to describe selected secondary agricultural teachers understanding of agricultural awareness and literacy in the state of Iowa. Review of literature and research findings indicated that the terms agricultural awareness and agricultural literacy mean different things to different people. Questions for this study were directed to Iowa agricultural educators in the public school system. The objectives of the study were reflected in the following research statements:

The objectives of this study were to:

1. Identify the demographic characteristics of secondary agriculture teachers in Iowa.
2. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness.
3. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural literacy.
4. Develop consensus definition of agricultural awareness.
5. Develop consensus definition of agricultural literacy.

**Findings**

The accessible population included 195 Iowa agricultural education teachers who were procured from the 2010-2011 Iowa State Department of Education. Of the 195 surveys, 91 surveys (46 %) were returned.

### Demographic Characteristics of Respondents

Fifty-nine (64.8 %) of the respondents were male and thirty-two (35.2%) of the respondents were female.

Table 1. Gender of Respondents (n=91)

<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
1. Male	59	64.8
2. Female	32	35.2

The age of respondents in this study ranged from 21 to above the age of 40 with a mean age of 31-35 years of age. The largest number of respondents fell in the above the age 40 year old age group (38.5%). Table 2 shows the distribution of respondents' age, corresponding frequency, and percentage within four-year ranges.

Table 2. Distribution of Respondents

<b>Age Range</b>	<b>Frequency</b>	<b>Percent</b>
21-25	15	16.5
26-30	11	12.1
31-35	9	20.9
36-40	11	12.1
Above 40	35	38.5

M=3.44

SD=1.50

Of the respondents, fifty-five individuals (60.4%) held a Bachelors degree; thirty-six (39.6%) individuals held a Masters degree; no individuals (0 %) held a Doctorial degree; and no individuals (0%) listed their degree as other (see Table 3).

Table 3. Distribution of Agricultural Education Teachers Highest Level of Education Attained (n=91)

<b>Level of Education</b>	<b>Frequency</b>	<b>Percent</b>
Bachelor's	55	60.4
Master's	36	39.6
PhD	0	0.0

Table 4 illustrates the years of experience of the agricultural education teachers in this study. Years of experience ranged 1 year to above 20 years.

Table 4. Distribution of Agricultural Education Teachers' Years of Teaching Experience (n=91)

<b>Years of Teaching Experience</b>	<b>Frequency</b>	<b>Percent</b>
1-5	25	27.5
6-10	19	20.1
11-15	16	17.6
16-20	7	7.7
Above 20	24	26.4

M=2.84      SD=1.55

The male age of respondents in this study ranged from 21 to above the age of 40 with a mean age of 31-35 years of age. The largest number of respondents fell in the above the age of 40-year-old age group (38.5%). Table 5 shows the distribution of respondents' age, corresponding frequency, and percentage within four-year ranges.

Table 5. Distribution of Male Respondents (n=59)

<b>Male Respondents</b>	<b>Frequency</b>	<b>Percent</b>
21-25	5	5.5
26-30	5	5.5
31-35	8	8.8
36-40	8	8.8
Above 40	33	36.3

M=38.2      SD=3.02

The female age of respondents in this study ranged from 21 to above the age of 40 with a mean age of 31-35 years of age. The largest number of respondents fell in the above the age 31-35 year old age group (12.1%). Table 6 shows the distribution of respondents' age, corresponding frequency, and percentage within four-year ranges.

Table 6. Distribution of Female Respondents (n=32)

<b>Female Respondents</b>	<b>Frequency</b>	<b>Percent</b>
21-25	10	11.0
26-30	6	6.6
31-35	11	12.1
36-40	3	3.2
Above 40	2	2.2
<hr/>		
M=37.33	SD=3.57	

Table 7 illustrates the agriculturally related jobs of the agricultural education teachers in this study.

Table 7. Distribution of Agricultural Education Teachers' Agriculturally related jobs (n=91)

<b>Agriculturally Related Jobs</b>	<b>Frequency</b>	<b>Percent</b>
USDA	3	3.3
Extension	9	9.9
Other Governmental Agencies	0	0.0
Agricultural Business Company	30	33.0
Other Related Jobs	32	35.2
<hr/>		
M=37.33	SD=3.57	

Of the thirty-two respondents that listed other related jobs, twenty-one respondents listed farming for their agriculturally related jobs besides as an agriculture education teacher, and eleven respondents that listed other, listed agricultural and tractor manufacturing facilities, banking, draft horse journals, meat cutter, meat packing, Farm Bureau, swine facility, Iowa Soybean Association, commodity association, businesses such as public and engineering, and AGCO Corporation.

### Secondary Agricultural Teachers Total Population

To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, the researcher designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1). Table 8 illustrates the total population of the perceptions of secondary agricultural teachers.

Table 8 Secondary Agricultural Teachers Total Population  
*Frequencies and Percentages for Perceptions of Agricultural Awareness and Agricultural Literacy*

Statement	Agricultural Awareness		Agricultural Literacy	
	Frequency	Percent	Frequency	Percent
Having a conscious mind about agriculture.	79	86.8	12	11.8
Having a cognizant mind about agriculture.	44	48.4	47	51.6
Having an understanding of the food and fiber systems, including the history and current economic, social, and environmental significance to all Americans.	36	39.6	55	60.3
Having an education about agriculture science	16	17.6	75	82.4
Having an understanding about agriculture science.	50	54.9	41	45.1
Does not require the student to become proficient in a given area, but requires general knowledge about it.	79	86.8	12	13.2
Agriculture taught in elementary school.	80	87.9	11	12.1
Agriculture is a continuous educational process.	18	19.8	73	80.2
Having a basic interest in the subject of agriculture	80	87.9	11	12.1
Having an attraction in the subject of agriculture.	61	67.0	30	33.0
Gaining basic knowledge in the subject of agriculture.	46	50.5	45	49.5
Gaining familiarity in the subject of agriculture.	64	70.3	27	29.7
Comprehending concepts about agriculture.	19	20.9	72	79.1
Comprehending principles about agriculture	15	16.5	76	83.8
Applying knowledge about agriculture.	12	13.2	79	86.8
Applying skills in agriculture.	13	14.3	78	85.7
Analyzing problems in agriculture.	12	13.2	79	86.8

Table 8 continued

Developing skills in agriculture.	16	17.6	75	82.4
Synthesizing issues in agriculture.	13	14.3	78	85.7
Facilitating learning about agriculture.	20	22.0	71	78.0
Teaching a lesson of instruction on the importance of agriculture in the 21st century.	41	45.1	50	55.9
Teaching a unit of instruction on basic meat science to 8th grade students.	40	44.0	51	56.0
Food for America, Farm Safety Day, Iowa Agriculture Youth Institute, Grow Cabbage Program, and the State Fair, is representatives of this area.	70	76.9	21	23.1
On-going classroom instruction, all 4-H & FFA activities), and SAE, are representatives of this area.	17	18.7	74	81.3

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### Secondary Agricultural Teachers Male Population

To identify the perceptions of secondary male agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1). Table 9 illustrates the male population of the perceptions of secondary agricultural teachers.

Table 9 Secondary Agricultural Teachers Male Population  
*Frequencies and Percentages for Perceptions of Agricultural Awareness and Agricultural Literacy*

Statement	Agricultural Awareness		Agricultural Literacy	
	Frequency	Percent	Frequency	Percent
Having a conscious mind about agriculture.	55	93.2	4	6.8
Having a cognizant mind about agriculture.	32	54.2	27	45.8
Having an understanding of the food and fiber systems, including the history and current economic, social, and environmental significance to all Americans.	26	44.1	33	55.9
Having an education about agriculture science	11	18.6	48	81.4
Having an understanding about agriculture science.	32	54.2	27	45.8
Does not require the student to become proficient in a given area, but requires general knowledge about it.	52	88.1	7	11.9
Agriculture taught in elementary school.	52	88.1	7	11.9
Agriculture is a continuous educational process.	17	28.8	42	71.2
Having a basic interest in the subject of agriculture	52	88.1	7	11.9
Having an attraction in the subject of agriculture.	35	59.3	24	40.7
Gaining basic knowledge in the subject of agriculture.	28	47.5	31	52.5
Gaining familiarity in the subject of agriculture.	40	67.8	19	32.2
Comprehending concepts about agriculture.	14	23.7	45	76.3
Comprehending principles about agriculture	11	18.6	48	81.4
Applying knowledge about agriculture.	7	11.9	52	88.1
Applying skills in agriculture.	9	15.3	50	84.7
Analyzing problems in agriculture.	8	13.6	51	86.4
Developing skills in agriculture.	10	16.9	49	83.1



Table 9 continued

Synthesizing issues in agriculture.	9	15.3	50	84.7
Facilitating learning about agriculture.	15	25.4	44	74.6
Teaching a lesson of instruction on the importance of agriculture in the 21st century.	26	44.1	33	55.9
Teaching a unit of instruction on basic meat science to 8th grade students.	26	44.1	33	55.9
Food for America, Farm Safety Day, Iowa Agriculture Youth Institute, Grow Cabbage Program, and the State Fair, is representatives of this area.	48	81.4	11	18.6
On-going classroom instruction, all 4-H & FFA activities), and SAE, are representatives of this area.	14	23.7	45	76.3

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### Secondary Agricultural Teachers Female Population

To identify the perceptions of secondary female agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1). Table 10 illustrates the female population of the perceptions of secondary agricultural teachers.

Table 10 Secondary Agricultural Teachers Female Population  
*Frequencies and Percentages for Perceptions of Agricultural Awareness and Agricultural Literacy*

Statement	Agricultural Awareness		Agricultural Literacy	
	Frequency	Percent	Frequency	Percent
Having a conscious mind about agriculture.	2	6.25	30	93.8
Having a cognizant mind about agriculture.	12	37.5	20	62.5
Having an understanding of the food and fiber systems, including the history and current economic, social, and environmental significance to all Americans.	10	31.3	22	68.8
Having an education about agriculture science	5	15.6	27	84.4
Having an understanding about agriculture science.	18	56.3	14	43.8
Does not require the student to become proficient in a given area, but requires general knowledge about it.	27	84.4	5	15.6
Agriculture taught in elementary school.	27	84.4	5	15.6
Agriculture is a continuous educational process.	2	6.25	30	93.8
Having a basic interest in the subject of agriculture	27	84.4	5	15.6
Having an attraction in the subject of agriculture.	25	78.1	7	21.9
Gaining basic knowledge in the subject of agriculture.	19	59.4	13	40.6
Gaining familiarity in the subject of agriculture.	23	71.9	9	28.1
Comprehending concepts about agriculture.	6	18.8	26	81.3
Comprehending principles about agriculture	4	12.5	28	87.5
Applying knowledge about agriculture.	5	15.6	27	84.5
Applying skills in agriculture.	4	12.5	28	87.5
Analyzing problems in agriculture.	4	12.5	28	87.5
Developing skills in agriculture.	6	18.8	26	81.3
Synthesizing issues in agriculture.	4	12.5	28	87.5

Table 10 continued

Facilitating learning about agriculture.	5	15.6	27	84.5
Teaching a lesson of instruction on the importance of agriculture in the 21st century.	15	46.9	17	53.1
Teaching a unit of instruction on basic meat science to 8th grade students.	14	43.8	18	56.3
Food for America, Farm Safety Day, Iowa Agriculture Youth Institute, Grow Cabbage Program, and the State Fair, is representatives of this area.	22	68.8	10	31.3
On-going classroom instruction, all 4-H & FFA activities), and SAE, are representatives of this area.	3	9.4	29	90.6

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### Comments

The last question of the survey asked, “What general comments do you have regarding agricultural awareness and agricultural literacy?” There were twenty-three respondents (25%) of the ninety-one respondents who chose to leave comments regarding their opinions on agricultural awareness and agricultural literacy. The comments were coded to match the Agricultural Awareness and Literacy Framework (AAALF) (Figure 1).

Thirteen respondents (57%) of the twenty-three respondents who made comments defined agricultural awareness and agricultural literacy that matched the AAALF.

**1. Being aware of agriculture – Having a basic interest or attraction to the subject.**

*Respondents defined being aware of agriculture as having basic knowledge of knowing that food products comes from the farm, knowing that agricultural awareness is relevant to everyone, and knowing that agricultural exist but not truly understanding agriculture concepts.*

**2. Being informed about agriculture – Gaining familiarity and basic knowledge of the subject**

*Respondents defined being informed about agriculture as having basic understanding of where your food, fiber, and natural resources come from, developing consumer intelligence, and that the agriculture industry includes and provides to humans.*

**3. Being literate about agriculture – Comprehending concepts and principles**

*Respondents defined being literate about agriculture as developing, enhancing, and in depth knowledge of agriculture. As well as understanding, the function of agriculture and knowing that agricultural is a complex study.*

**4. Being educated in agriculture – Applying, analyzing knowledge, and skills.**

*Respondents defined being educated in agriculture as the application of knowledge in the food, fiber, and natural resource sector. Being educated in agriculture involves a great depth and breadth of agriculture practices, principles, and skills. As well as being involved in the facet of production and/or processing.*

**5. Being an agricultural educator – Synthesizing, sharing, and facilitating learning**

*Respondents defined being an agricultural educator as understanding and synthesis of agricultural knowledge. Educating the public about the importance of agriculture and its role in our lives. Education through agriculture education programs and FFA by providing students and members with the knowledge they need.*

There were three respondents (13%) of the twenty-three respondents that stated the terms agricultural awareness and agricultural literacy are the same. There were comments from respondents that said the term agricultural awareness and agricultural literacy were interchangeable. Respondents felt that many of the questions could have been described as both and was not sure of how the two terms agricultural awareness and agricultural literacy are different in some cases.

There were seven respondents (30%) of the twenty-three respondents that stated society is moving farther away from agrarian roots, the public need to be made aware of the importance of agriculture to their society through proper teachings in agricultural education. Respondents stated that agricultural awareness is mandatory and agricultural literacy is a benefit. In addition, it was stated that preparing the future needs of food and fiber in the world will take first awareness and then literacy to meet a true understanding of agriculture.

**CHAPTER 5**  
**DISCUSSION OF THE RESULTS**  
**Purpose of the Study**

The purpose of this study was to describe selected secondary agricultural teachers understanding of agricultural awareness and agricultural literacy in the state of Iowa. Review of literature and research findings indicated that the terms agricultural awareness and agricultural literacy mean different things to different people. Questions for this study were directed to Iowa agricultural educators in the public school system. The objectives of the study were reflected in the following research statements:

The objectives of this study were to:

1. Identify the demographic characteristics of secondary agriculture teachers in Iowa.
2. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness.
3. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural literacy.
4. Develop consensus definition of agricultural awareness.
5. Develop consensus definition of agricultural literacy.

**Secondary Agricultural Teachers Total Population**

To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

There were eleven agricultural awareness statements and thirteen agricultural literacy statements designed toward defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework.

Out of the eleven agricultural awareness statements, two (18.0%) statements that were focused on agricultural awareness and the majority identified as agricultural literacy statements. Out of the thirteen agricultural literacy statements, all (100%) were identified as agricultural literacy statements.

### **Secondary Agricultural Teachers Male Population**

To identify the perceptions of secondary male agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, two (18.0%) statements that were focused on agricultural awareness and the majority identified as statements of agricultural literacy. Out of the thirteen agricultural literacy statements, all (100%) identified as agricultural literacy statements.

### **Secondary Agricultural Teachers Female Population**

To identify the perceptions of secondary female agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, four (36.0%) statements that were focused on agricultural awareness and the majority identified as statements of agricultural

literacy. Out of the thirteen agricultural literacy statements, all (100%) identified as agricultural literacy statements.

### **Age of Respondents**

There were fifteen respondents (16.5%) who were between the ages of 21-25. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, all (100.0%) statements that were focused on agricultural awareness were identified as agricultural literacy statements by a majority of the respondents. Out of the thirteen agricultural literacy statements, one (7.0%) was identified as an agricultural awareness statement.

Eleven respondents (12.1%) were between the ages of 26-30. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, two (18.0%) statements that were focused on agricultural awareness were identified as agricultural literacy statements by the majority of the respondents. Out of the thirteen agricultural literacy statements, three (23.0%) were identified as an agricultural awareness statement.

Nineteen respondents (20.9%) were between the ages of 31-35 years of age. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural

awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, two (18.0%) statements that were focused on agricultural awareness were identified as agricultural literacy statements by majority of the respondent. Out of the thirteen agricultural literacy statements, all (100%) were identified as agricultural literacy statements.

Eleven respondents (12.1%) were between the ages of 36-40. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, two (18.0%) statements that were focused on agricultural awareness were identified as agricultural literacy statements. Out of the thirteen agricultural literacy statements, two (15.0%) were identified as agricultural awareness literacy statements.

Thirty-five respondents (38.5%) were above the age of 40. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, three (27.0%) statements that were focused on agricultural awareness were identified as agricultural literacy statements by a



majority of the respondents. Out of the thirteen agricultural literacy statements, all (100%) were identified as agricultural literacy statements.

### **Number of Years of Teaching Agriculture Experience of Respondents**

Twenty-five respondents (27.5%) had 1-5 years of teaching agriculture experience. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, all (100.0%) statements that were focused on agricultural awareness were identified as agricultural literacy statements by a majority of the respondents. Out of the thirteen agricultural literacy statements, one (7.0%) was identified as agricultural awareness.

Nineteen respondents (20.1%) had 6-10 years of teaching agriculture experience. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, two (18.0%) statements that were focused on agricultural awareness were identified as agricultural literacy statements by majority of the respondents. Out of the thirteen agricultural literacy statements, all (100%) were identified as agricultural literacy statements.

Sixteen respondents (17.6%) had 11-15 years of teaching agriculture experience. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural

awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, one (9.0%) statements that was focused on agricultural awareness was identified as an agricultural literacy statement by majority of the respondents. Out of the thirteen agricultural literacy statements, one (7.0%) was identified as agricultural awareness statements.

Seven respondents (7.7%) had 16-20 years of teaching agriculture experience. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, four (36.0%) statements that were focused on agricultural awareness were identified as agricultural literacy statements by a majority of the respondents. Out of the thirteen agricultural literacy statements, three (23.0%) were identified as agricultural awareness statements.

Twenty-four respondents (26.4%) had above 20 years of teaching agriculture experience. To identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness and agricultural literacy, we designed statements that were focused on defining agricultural awareness and agricultural literacy, based on the Agricultural Awareness and Literacy Framework (Figure 1).

Out of the eleven agricultural awareness statements, four (36.0%) statements that were focused on agricultural awareness were identified as agricultural literacy statements by a

majority of the respondents. Out of the thirteen agricultural literacy statements, all (100%) were identified as agricultural literacy statements.

**CHAPTER 6**  
**SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**  
**Purpose of the Study**

The purpose of this study was to describe selected secondary agricultural teachers understanding of agricultural awareness and agricultural literacy in the state of Iowa. Review of literature and research findings indicated that the terms agricultural awareness and agricultural literacy mean different things to different people. Questions for this study were directed to Iowa agricultural educators in the public school system. The objectives of the study were reflected in the following research statements:

The objectives of this study were to:

1. Identify the demographic characteristics of secondary agriculture teachers in Iowa.
2. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural awareness.
3. Identify the perceptions of secondary agricultural teachers regarding the definition of agricultural literacy.
4. Develop consensus definition of agricultural awareness.
5. Develop consensus definition of agricultural literacy.

**Summary**

The accessible population for the study included 195 teachers who were currently teaching secondary agriculture education during the school year of 2010-2011 in Iowa. Most of the teachers included males above the age of 40 (36.3%). Most of the teachers included males that have taught over 20 years (26.4%) who are currently teaching secondary agriculture education.

When applying the Agricultural Awareness and Literacy Framework to the survey statements that were focused on agriculture awareness nine (81.0%) of the eleven statements, a majority of the respondents chose agricultural statements as being agricultural awareness. Two (18.0%) of the eleven respondents survey statements that were focused on agriculture awareness had a majority of the respondents identify the agricultural statements as agricultural literacy statements.

When applying the Agricultural Awareness and Literacy Framework to the survey statements that were focused on agriculture literacy, thirteen (100.0%) of the thirteen statements had a majority of the respondents select the statements as agricultural literacy statements. Of the survey statements that were focused on agriculture literacy, none (0.0%) of the thirteen statements had a majority of the respondents selecting agricultural statements as agricultural awareness statements.

The results of this study indicated that the understanding of what constitutes agricultural awareness and agricultural literacy varied among Iowa secondary agricultural teachers. Since there was no consensus, an implication from the study will help to start developing a consensus or agreement for defining agricultural awareness and agricultural literacy. Having a common definition and understanding of the terms would help focus the course content for imparting agricultural education. In addition, teaching methods and strategies could be designed effectively if there is a consensus understanding of the terms.

A *suggested* definition for agricultural awareness and agricultural literacy was developed from the Agricultural Awareness and Literacy Framework Model.

**Agricultural awareness** is defined as having a basic interest or attraction to the subject of agriculture, gaining familiarity, and basic knowledge of the agriculture.

**Agricultural literacy** is defined as comprehending concepts, principles, and being able to apply, analyze knowledge, and skills in agriculture.

### **Conclusion**

We can conclude from the study there is no consensus definition for agricultural awareness and agricultural literacy among agricultural education teachers in Iowa. Since there is not a consensus definition for agricultural awareness and agricultural literacy, there is not a clear understanding of the two definitions. There needs to be a consensus definition of agricultural awareness and agricultural literacy taught to agricultural educators at the collegiate level. There needs to be a consensus definition of agricultural awareness and agricultural literacy taught in the elementary, middle and high school, and agricultural programs such as FFA, 4H, and agricultural fairs.

### **Recommendations**

The following recommendations are based on the results of this study of Iowa Agricultural Education Teachers perceptions on defining agricultural awareness and agricultural literacy.

1. It is recommended that the suggested definitions be taken further for consideration to be used in the curriculum.
2. Another important recommendation from this study is that course curricula at elementary and high schools be developed based on definitions in such ways that the concepts impart the interest in agriculture at the elementary level and knowledge and expertise at high school and post-secondary levels, respectively.

3. It is recommended that additional research should be conducted to determine the nature of agricultural awareness and agricultural literacy of students in agricultural education programs in Iowa.
4. It is recommended that the study be replicated on a regional or national basis.
5. It is recommended that the Agricultural Awareness and Literacy Framework Model that was developed in 2008, should be used in both formal and non-formal educational settings. The course curricula at a formal educational institution can be designed in such ways that they impart the interest in agriculture at the elementary level and knowledge and expertise at high school and post-secondary levels respectively. If knowledge is imparted by the time students leave the high school, they can make informed decisions regarding careers and their concerns about food and their environment.

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## APPENDIX A

### Appendix A

#### Secondary School Agricultural Educators Perceptions of Agricultural Awareness and Agricultural Literacy

The questionnaire is designed to measure your perceptions of agricultural awareness and agricultural literacy. There is no right or wrong answer for each question. However, it is important for you to respond as accurately as possible by indicating the appropriate response.

#### **Part I. General Information**

1. What is your gender?
  - a) Female
  - b) Male
  
2. What is your age?
  - a) 21-25
  - b) 26-30
  - c) 31-35
  - d) 36-40
  - e) Above 40
  
3. What is your highest educational qualification?
  - a) Bachelor's Degree
  - b) Master's Degree
  - c) Doctorate
  - d) Other (Please Specify) \_\_\_\_\_
  
4. What was your college major/s? Please list below.
 

---
  
5. Have you ever worked for an agriculturally related job besides as an agriculture education teacher? (Examples: USDA, Farming, Extension, e.g.)  
(Please circle one)
  - a) Yes
  - b) No

If yes, please check all that apply.

- USDA
- Extension
- Other Governmental Agencies
- Agricultural Business Company
- Other (Please Specify) \_\_\_\_\_

6. How many years have you been teaching agricultural education?
- a) 1-5
  - b) 6-10
  - c) 11-15
  - d) 16-20
  - e) Above 20

**Part II. Perceptions regarding Agricultural Awareness and Agricultural Literacy**

For the following statements, please indicate whether these statements represent agricultural awareness or represent agricultural literacy.

	Agricultural Awareness	Agricultural Literacy
1. Having a conscious mind about agriculture.		
2. Having a cognizant mind about agriculture.		
3. Having an understanding of the food and fiber systems, including the history and current economic, social, and environmental significance to all Americans.		
4. Having an education about agriculture science.		
5. Having an understanding about agriculture science.		
6. Does not require the student to become proficient in a given area, but requires general knowledge about it.		
7. Agriculture taught in elementary school.		
8. Agriculture is a continuous educational process.		
9. Having a basic interest in the subject of		

agriculture.		
10. Having an attraction in the subject of agriculture.		
11. Gaining basic knowledge in the subject of agriculture.		
12. Gaining familiarity in the subject of agriculture.		
13. Comprehending concepts about agriculture.		
14. Comprehending principles about agriculture.		
15. Applying knowledge about agriculture.		
16. Applying skills in agriculture.		
17. Analyzing problems in agriculture.		
18. Developing skills in agriculture.		
19. Synthesizing issues in agriculture.		
20. Facilitating learning about agriculture.		
21. Teaching a lesson of instruction on the importance of agriculture in the 21st century.		
22. Teaching a unit of instruction on basic meat science to 8th grade students.		
23. Food for America, Farm Safety Day, Iowa Agriculture Youth Institute, Grow Cabbage Program, and the State Fair, are representatives of this area.		

24. On-going classroom instruction, all 4-H & FFA activities), and SAE, are representatives of this area.		
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25. What general comments do you have regarding agricultural awareness and agricultural literacy? List comments in the blank space.

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## APPENDIX B

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

Institutional Review Board  
Office for Responsible Research  
Vice President for Research  
1138 Pearson Hall  
Ames, Iowa 50011-2207  
515 294-4566  
FAX 515 294-4267

**Date:** 4/22/2011

**To:** Ashley Batts  
223 Curtiss Hall

**CC:** Dr. Robert Martin  
201 Curtiss Hall

**From:** Office for Responsible Research

**Title:** Secondary Agricultural Teachers Understanding of the Differences between Agricultural Awareness and Literacy

**IRB Num:** 11-111

**Submission Type:** New

**Exemption Date:** 4/21/2011

The project referenced above has undergone review by the Institutional Review Board (IRB) and has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b). The IRB determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as proposed in the IRB application, including obtaining and documenting informed consent if you have stated in your application that you will do so or if required by the IRB.**
- **Any modification of this research should be submitted to the IRB on a Continuing Review and/or Modification form, prior to making any changes, to determine if the project still meets the federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB proposal will need to be submitted and approved before proceeding with data collection.**

Please be sure to use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.

Please note that you must submit all research involving human participants for review by the IRB. Only the IRB may make the determination of exemption, even if you conduct a study in the future that is exactly like this study.

**FUNDING INFORMATION**

<input checked="" type="checkbox"/> Internally funded, please provide account number:
<input type="checkbox"/> Externally funded, please provide funding source and account number:
<input type="checkbox"/> Funding is pending, please provide OSPA Record ID on GoldSheet: Title on GoldSheet if different from above:
<input type="checkbox"/> Other: (e.g., <i>funding will be applied for later</i> )
<input checked="" type="checkbox"/> Student Project—no funding or funding provided by student (per PI 3/14/11 AS)

**SCIENTIFIC REVIEW**

Although the assurance committees are not intended to conduct peer review of research proposals, the federal regulations include language such as “consistent with sound research design,” “rationale for involving animals or humans” and “scientifically valuable research,” which requires that the committees consider in their review the general scientific relevance of a research study. Proposals that do not meet these basic tests are not justifiable and cannot be approved. If an assurance review committee(s) has concerns about the scientific merit of a project and the project was not competitively funded by peer review or was funded by corporate sponsors, the project may be referred to a scientific review committee. The scientific review committee will be an ad hoc and will consist of your ISU peers and outside experts as needed. If this situation arises, the PI will be contacted and given the option of agreeing that a consultant may be contacted or withdrawing the proposal from consideration.

Yes  No Has or will this project receive peer review?

If the answer is “yes,” please indicate who did or will conduct the review:

If a review was conducted, please indicate the outcome of the review:

**COLLECTION OR RECEIPT OF SAMPLES**

Will you be: (Please check all that apply.)

Yes  No Receiving samples from outside of ISU? See examples below.  
 Yes  No Sending samples outside of ISU? See examples below.

Examples include: genetically modified organisms, body fluids, tissue samples, blood samples, pathogens.

If you will be receiving samples from or sending samples outside of ISU, please identify the name of the outside organization(s) and the identity of the samples you will be sending or receiving outside of ISU. If the outside organizations have not been identified, please check no for both questions above.

NA

Please note that **some samples may require a USDA Animal Plant Health Inspection Service (APHIS) permit, a USPHS Centers for Disease Control and Prevention (CDC) Import Permit for Etiologic Agents, a Registration for Select Agents, High Consequence Livestock Pathogens and Toxins or Listed Plant Pathogens, or a Material Transfer Agreement (MTA) [EH&S Website](#)**

**ASSURANCE**

- I certify that the information provided in this application is complete and accurate and consistent with any proposal(s) submitted to external funding agencies.
- I agree to provide proper surveillance of this project to ensure that the rights and welfare of the human subject or welfare of animal subjects are protected. I will report any problems to the appropriate assurance review committee(s).
- I agree that I will not begin this project until receipt of official approval from all appropriate committee(s).
- I agree that modifications to the originally approved project will not take place without prior review and approval by the appropriate committee(s), and that all activities will be performed in accordance with all applicable federal, state, local and Iowa State University policies.

**CONFLICT OF INTEREST**

A conflict of interest can be defined as a set of conditions in which an investigator's or key personnel's judgment regarding a project (including human or animal subject welfare, integrity of the research) may be influenced by a secondary interest (e.g., the proposed project and/or a relationship with the sponsor). ISU's Conflict of Interest Policy requires that investigators and key personnel disclose any significant financial interests or relationships that may present an actual or potential conflict of interest. By signing this form below, you are certifying that all members of the research team, including yourself, have read and understand ISU's Conflict of Interest policy as addressed by the ISU Faculty Handbook (<http://www.provost.iastate.edu/faculty>) and have made all required disclosures.

- Yes  No Do you or any member of your research team have an actual or potential conflict of interest?  
 Yes  No If yes, have the appropriate disclosure form(s) been completed?

**SIGNATURES**

*Ashley Nicole Bots* 2/22/2011  
 Signature of Principal Investigator Date

*W. Wade Martin* 2/22/2011  
 Signature of Department Chair Date

The Major Professor/Supervising Faculty member must sign the cover page in the section entitled "For Student Projects".

**PLEASE NOTE: Any changes to an approved protocol must be submitted to the appropriate committee(s) before the changes may be implemented.**

**Please proceed to SECTION II.**

**SECTION II: IRB SECTION - STUDY SPECIFIC INFORMATION**

Please complete all of the following questions.

**STUDY OBJECTIVES**

Briefly explain in **language understandable to a layperson** the specific aim(s) of the study.

**The specific purpose of this study is to identify the perceptions of secondary agricultural teachers in the State of Iowa regarding aspects relative to agricultural awareness and agricultural literacy and their perceptions of agricultural awareness and agricultural literacy.**

**BENEFITS TO SOCIETY AND PARTICIPANTS**

Explain in **language understandable to a layperson** how the information gained in this study will advance knowledge, and/or serve the good of society. Please also describe the direct benefits to research participants; if there are no direct benefits to participants, indicate that. **Note:** monetary compensation cannot be considered a benefit to participants.

Determining the definition of agricultural awareness and agricultural literacy and the identification of the best practices and the concepts that can be used in helping the public become aware and literate about the agricultural and life sciences which will lead to the development of new curriculum materials and a better understanding of the concepts of agricultural awareness and agricultural literacy.

**PART A: PROJECT INVOLVEMENT**

- 1)  Yes  No Is this project part of a Training, Center, Program Project Grant?  
Director Name: \_\_\_\_\_ Overall IRB ID: \_\_\_\_\_
- 2)  Yes  No Is the purpose of this project to develop survey instruments?
- 3)  Yes  No Does this project involve an investigational new drug (IND)? Number: \_\_\_\_\_
- 4)  Yes  No Does this project involve an investigational device exemption (IDE)? Number: \_\_\_\_\_
- 5)  Yes  No Does this project involve existing data or records?
- 6)  Yes  No Does this project involve secondary analysis?
- 7)  Yes  No Does this project involve pathology or diagnostic specimens?
- 8)  Yes  No Does this project require approval from another institution? Please attach letters of approval.
- 9)  Yes  No Does this project involve DEXA/CT scans or X-rays?

**PART B: MEDICAL HEALTH INFORMATION OR RECORDS**

- 10)  Yes  No Does your project require the use of a health care provider's records concerning past, present, or future physical, dental, or mental health information about a subject? The Health Insurance Portability and Accountability Act established the conditions under which protected health information may be used or disclosed for research purposes. If your project will involve the use of any past or present clinical information about someone, or if you will add clinical information to someone's treatment record (electronic or paper) during the study, you must complete and submit the Application for Use of Protected Health Information.

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Director Name: \_\_\_\_\_ Overall IRB ID: \_\_\_\_\_
- 2)  Yes  No Is the purpose of this project to develop survey instruments?
- 3)  Yes  No Does this project involve an investigational new drug (IND)? Number: \_\_\_\_\_
- 4)  Yes  No Does this project involve an investigational device exemption (IDE)? Number: \_\_\_\_\_
- 5)  Yes  No Does this project involve existing data or records?
- 6)  Yes  No Does this project involve secondary analysis?
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- 9)  Yes  No Does this project involve DEXA/CT scans or X-rays?

**PART B: MEDICAL HEALTH INFORMATION OR RECORDS**

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**PART C: ANTICIPATED ENROLLMENT**

<b>Estimated number of participants to be enrolled in the study</b> Total: 240    Males: 190    Females: 50	
Check if any enrolled participants are:	Check below if this project involves either:
<input type="checkbox"/> Minors (Under 18)	<input checked="" type="checkbox"/> Adults, non-students
Age Range of Minors:	<input type="checkbox"/> Minor ISU students
<input type="checkbox"/> Pregnant Women/Fetuses	<input type="checkbox"/> ISU students 18 and older
<input type="checkbox"/> Cognitively Impaired	<input type="checkbox"/> Other (explain)
<input type="checkbox"/> Prisoners	
<b>List estimated percent of the anticipated enrollment that will be minorities if known:</b>	
American Indian:	Alaskan Native:
Asian or Pacific Islander:	Black or African American:
Latino or Hispanic:	

**PART D: PARTICIPANT SELECTION**

Please use additional space as necessary to adequately answer each question.

11. Explain the procedures and rationale for selecting participants, including the inclusion and exclusion criteria (e.g., where will names come from, what persons will be included or excluded and why, etc.).

Participants will include secondary agriculture teachers. These participants are part of professional organization which have directories available to the public. *Since its creation, the profession has had predominantly male*

12. Describe the procedures for contacting participants (e.g., letter, email, flyer, advertisements, phone call, etc.). Attach copies of any letters, scripts, flyers, or advertisements that will be used. Recruitment materials should include a statement of the voluntary and confidential nature of the research.
- teachers of agriculture. It was not until 1969 that women could be accepted into the educational program in agriculture. Since that time, the number of female agriculture teachers nationally has grown, but at a slower pace than desired. This is the reason for the different numbers. (per PL 3/14/11 A-2)*

Five letters will be sent electronically, with the survey link included. Emails will be sent to the subjects informing them about their selection to participate. Following the approval for the study from the IRB at ISU, introduction letters containing the purpose of this study, potential usefulness, confidentiality, and consent details was sent to the participants via email and consent will be assumed if they agree to participate in the study. The introduction letter will inform the respondents about their selection to participate in this study, which is voluntary and they can withdraw at any time during the study. The code number on the questionnaire will be the same as the code number assigned to the subject and will be used to identify respondents who would return their completed questionnaire. This will provide (1) some degree of anonymity to the subjects, and (2) the researcher a method for installing follow-up procedures with non-respondents. Two weeks after emailing the initial packet, an email reminder will be sent to non-respondents explaining that their response is important for this study. After this reminder, the third follow up will be made, each in ten-day gaps. In the first follow up, a second complete email packet will be sent to the non-respondent. In the second follow up, non-respondents will be reminded by email, and by email in the third follow up. Response rate will be calculated as a percentage of the total number of questionnaire emailed to all participants. In order to handle the non-response rate the researcher will use the Double-dip method. The researcher will keep a logbook of all events that occur throughout the data

collection process.

#### PART E: RESEARCH PLAN

Include sufficient detail for IRB review of this project independent of the grant, protocol, or other documents.

13. The information needed here is similar to that in the "methods" or "procedures" sections of a research proposal—it should describe the flow of events that will occur during your interactions with subjects. Please describe in detail your plans for collecting data from participants, including all procedures, tasks, or interventions participants will be asked to complete during the research (e.g., random assignment, any conditions or treatment groups into which participants will be divided, mail survey or interview procedures, sensors to be worn, amount of blood drawn, etc.). This information is intended to inform the committee of the procedures used in the study and their potential risk. Please do not respond with "see attached" or "not applicable."

The target populations for this study consisted of all agriculture teachers in the state of Iowa. A list of the potential participants will be procured from the Iowa State Department of Education. I will identify the people who have a chance to be included in the survey, by agriculture teachers' acceptance to be part of the research. To minimize the frame error, the list of the agricultural teachers will be compared with the names from each staff directory as to not to duplicate the teachers that are in the list. The questionnaire will consist of two parts: demographic and perception questions. The first part of the questionnaire will have the demographic questions: highest educational level, gender, age, agricultural related jobs, and number of years of teaching agricultural education. The second part of the questionnaire will be choosing between agricultural awareness or agricultural literacy to determine the true perception of agricultural awareness or agricultural literacy. Clear instructions will be provided throughout the questionnaire to help potential respondents to better understand the procedures for their responses. A pilot test will be conducted and 10-20 people will be randomly selected from the total population. The feedback received from agricultural professionals after the study will be incorporated in the survey instrument to improve its face and content validity. Reliability of the instrument (Cronbach's coefficient,  $\alpha$ ) will be determined from the pilot study data. Should the Cronbach's alpha be less than 0.7 (Nunnally, 1978), researchers will take care to re-examine and correct the statements in the questionnaire in order to improve the alpha value of the instrument. The final improved questionnaire will be emailed to the potential respondents of this study for data collection. The incomplete questionnaires will not be used for the data analysis or included in any part of this research. Descriptive statistics will be used to analyze the data from the study. Data will be analyzed using SPSS version 17.0. Descriptive statistical tools that will be used in the data analysis for this study are the mean, standard deviation, frequencies and percentages. Completed questionnaires will serve as data source for the study. Independent t-test will be used to test the significance of perceptions between respondents and non-respondents. A level of significance would be set at 0.05. Findings of the study will be used to prepare a Master of Science thesis. After the approval of thesis by the advisory committee, all questionnaires will be destroyed.

14. For studies involving pathology/diagnostic specimens, indicate whether specimens will be collected prospectively and/or already exist "on the shelf" at the time of submission of this review form. If prospective, describe specimen procurement procedures; indicate whether any additional medical information about the subject is being gathered, and whether specimens are linked at any time by code number to the participant's identity. If this question is not applicable, please type N/A in the response cell.

Not applicable (per PI 3/14/11 AS)

15. For studies involving deception or where information is intentionally withheld from participants, such as the full purpose of the study, please explain how persons will be deceived or what information will be withheld. Additionally, a waiver of the applicable elements of consent will be needed. Please complete the "Waiver of Elements of Consent" form (available at the IRB website). If this question is not applicable, please type N/A in the response cell.

Not Applicable

**PART F: CONSENT PROCESS**

A copy of any translated informed consent documents and an English version should be submitted with the application. Provide the name of the individual who translated the consent documents, their qualifications for translating documents, and in particular informed consent documents, below.

If the consent process does not include documented consent, a waiver of documentation of consent must be requested. If any information about the study is intentionally withheld or misleading (i.e., deception is used), a waiver of the elements of consent must be requested. Forms for requesting waivers are available at the IRB website.

16. Describe the consent process for adult participants (those who are age 18 and older).

An information letter, which will include all the elements of consent and purpose of the research will be sent to all the research participants via an email. This letter will clearly indicate that participation in this survey is voluntary. Consent will be assumed if participants and participate in the survey.

17. If your study involves minor children, please explain how parental consent will be obtained prior to enrollment of the minor(s).

Not Applicable

18. Please explain how assent will be obtained from minors (younger than 18 years of age), prior to their enrollment. Also, please explain if the assent process will be documented (e.g., a simplified version of the consent form, combined with the parental informed consent document). According to the federal regulations assent "...means a child's affirmative agreement to participate in research. Mere failure to object should not, absent affirmative agreement, be construed as assent."

Not Applicable

**PART G: DATA ANALYSIS**

19. Describe how the data will be analyzed (e.g. statistical methodology, statistical evaluation, statistical measures used to evaluate results).

Descriptive and inferential statistics will be used to analyze the data and report the findings.

**PART H: RISKS**

The concept of risk goes beyond physical risk and includes risks to participants' dignity and self-respect as well as psychological, emotional, legal, social or financial risk.

20.  Yes  No Is the *probability* of the harm or discomfort anticipated in the proposed research greater than that encountered ordinarily in daily life or during the performance of routine physical or psychological examinations or tests?
21.  Yes  No Is the *magnitude* of the harm or discomfort greater than that encountered ordinarily in daily life, or during the performance of routine physical or psychological examinations or tests?
22. Describe any risks or discomforts to the participants and how they will be minimized and precautions taken. Do *not* respond with N/A. If you believe that there will not be risk or discomfort to participants, you must explain why.

There is no anticipated risk or discomfort in this study. The survey does not ask the participants to provide any



sensitive information. The participation in the survey is voluntary and the participants can refrain from responding to the questions if deemed necessary by them

23. If this study involves vulnerable populations, including minors, pregnant women, prisoners, the cognitively impaired, or those educationally or economically disadvantaged, what additional protections will be provided to minimize risks?

Not applicable

#### PART I: COMPENSATION

24.  Yes  No Will participants receive compensation for their participation? If yes, please explain.

Do not make the payment an inducement, only a compensation for expenses and inconvenience. If a person is to receive money or another token of appreciation for their participation, explain when it will be given and any conditions of full or partial payment. (E.g., volunteers will receive \$5.00 for each of the five visits in the study or a total of \$25.00 if he/she completes the study. If a participant withdraws from participation, they will receive \$5.00 for each of the visits completed.) It is considered undue influence to make completion of the study the basis for compensation.

#### PART J: CONFIDENTIALITY

25. Describe below the methods that will be used to ensure the confidentiality of data obtained. (For example, who has access to the data, where the data will be stored, security measures for web-based surveys and computer storage, how long data or specimens will be retained, anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased, etc.)

Only the researchers will have access to the data. The names of the participants will not be identified against the data and the data will be deleted after publishing the results. Results will be released online in aggregate form per consented survey. The study data will be stored in a computer program through the Brenton Center Survey Monkey program only available to the researcher. Data will be deleted in August 2011 as soon as full analysis is made (per PI 3/14/11A⇒)

**PART K: REGISTRY PROJECTS**

26. To be considered a registry: (1) the individuals must have a common condition or demonstrate common responses to questions; (2) the individuals in the registry might be contacted in the future; and (3) the names/data of the individuals in the registry might be used by investigators other than the one maintaining the registry.

Yes  No Does this project establish a registry?

If "yes," please provide the registry name below.

\_\_\_\_\_

**Checklist for Attachments**

Listed below are the types of documents that should be submitted for IRB review. Please check and attach the documents that are applicable for your study:

- A copy of the informed consent document **OR**  Letter of introduction containing the elements of consent
- A copy of the assent form if minors will be enrolled
- Letter of approval from cooperating organizations or institutions allowing you to conduct research at their facility
- Data-gathering instruments (including surveys)
- Recruitment fliers, phone scripts, or any other documents or materials participants will see or hear

The original signed copy of the application form and one set of accompanying materials should be submitted for review. **Federal regulations require that one copy of the grant application or proposal be submitted for comparison with the application for approval.**

**FOR IRB USE ONLY:**

Action by the Institutional Review Board (IRB):

- Project approved. Date: \_\_\_\_\_
- Project is exempt. Date: 4/21/11
- Project not approved. Date: \_\_\_\_\_
- IRB approval is not required. Date: \_\_\_\_\_
  - Project is not research according to the federal definition.
  - Project does not include human subjects as defined by the federal regulations.

Quani K. Ament  
IRB Approval Signature

4/21/11  
Date

**SECTION III: ENVIRONMENTAL HEALTH AND SAFETY INFORMATION**

- Yes  No Does this project involve human cell or tissue cultures (primary OR immortalized), or human blood components, body fluids or tissues?

**PART A: HUMAN CELL LINES**

- Yes  No Does this project involve human cell or tissue cultures (primary OR immortalized cell lines/strains) that have been documented to be free of bloodborne pathogens? If the answer is "yes," please answer question 1 below and attach copies of the documentation.

- 1) Please list the specific cell lines/strains to be used, their source and description of use.

CELL LINE	SOURCE	DESCRIPTION OF USE

Add New Row

- 2) Please refer to the ISU "Bloodborne Pathogens Manual," which contains the requirements of the OSHA Bloodborne Pathogens Standard. Please list the specific precautions to be followed for this project below (e.g., retractable needles used for blood draws):

**Anyone working with human cell lines/strains that have not been documented to be free of bloodborne pathogens is required to have Bloodborne Pathogen Training annually. Current Bloodborne Pathogen Training dates must be listed in Section I for all Key Personnel. Please contact Environmental Health and Safety (294-5359) if you need to sign up for training and/or to get a copy of the Bloodborne Pathogens Manual (<http://www.ehs.iastate.edu/cms/default.asp?action=article&ID=214>)**

**PART B: HUMAN BLOOD COMPONENTS, BODY FLUIDS OR TISSUES**

- Yes  No Does this project involve human blood components, body fluids or tissues? If "yes," please answer all of the questions in the "Human Blood Components, Body Fluids or Tissues" section.

- 1) Please list the specific human substances used, their source, amount and description of use.

SUBSTANCE	SOURCE	AMOUNT	DESCRIPTION OF USE
<i>E.g., Blood</i>	<i>Normal healthy volunteers</i>	<i>2 ml</i>	<i>Approximate quantity, assays to be done.</i>

Add New Row

- 2) Please refer to the ISU "Bloodborne Pathogens Manual," which contains the requirements of the OSHA Bloodborne Pathogens Standard. Specific sections to be followed for this project are:

Office for Responsible Research: IRB 9/13/10

Anyone working with human blood components, body fluids or tissues is required to have Bloodborne Pathogen Training annually. Current Bloodborne Pathogen Training dates must be listed in Section I for all Key Personnel. Please contact Environmental Health and Safety (294-5359) if you need to sign up for training and/or to get a copy of the Bloodborne Pathogens Manual (<http://www.ehs.iastate.edu/cms/default.asp?action=article&ID=214>).

## CONTACT 1: PRE-NOTIFICATION

Ashley Batts  
Graduate Student  
Department of Agricultural Education and Studies  
Iowa State University

[Date]

Dear Agriculture Education Teacher:

I am a graduate student at Iowa State University pursuing a graduate degree in Agricultural Education. I am working with Dr. Robert Martin on this project. In a few days, we will begin a statewide study to identify current perceptions of agricultural educators regarding understanding of the differences between agricultural awareness and agricultural literacy in Iowa. As the agricultural educator contact in your school district, your input is valuable.

In the coming days we will be sending you a link to a web-based questionnaire regarding your current perceptions of agricultural educators regarding understanding of the differences between agricultural awareness and agricultural literacy in Iowa. It will take you approximately 10 minutes to complete this questionnaire. Your participation in this study is voluntary and confidential.

Please consider participating in this study. The focus of this study is an assessment of the understanding of the concepts of agricultural awareness and agricultural literacy as perceived by agricultural teachers. It is evident that there is some confusion about the definition of the terms "agricultural awareness" and "agricultural literacy". While it may be difficult for the general public to define the term "agricultural literacy" or "agricultural awareness," private foundations and government agencies have financially supported the idea that there is a need for the general public to have basic understanding of agriculture, the agricultural industry, and its importance to our country and citizens. Across the United States, there are a multitude of organizations working to educate children and youth about agricultural awareness and literacy. Your input will help to identify the professional educators understanding of the terms agricultural awareness and agricultural literacy in Iowa and to develop definitions for agricultural awareness and literacy based on the data generated.

Please watch for an email from us in the coming days. If you have questions or comments please contact Ashley Batts by email at [anbatts@iastate.edu](mailto:anbatts@iastate.edu) or by phone at (515) 294-0896.

Thank you in advance.  
Ashley Batts  
Graduate Research Assistant  
515-294-0896  
[anbatts@iastate.edu](mailto:anbatts@iastate.edu)

Dr. Robert Martin  
Professor  
515-294-0896  
[drmartin@iastate.edu](mailto:drmartin@iastate.edu)

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

## CONTACT 2: FIRST NOTIFICATION

[Date]

Dear Agriculture Education Teacher:

A few days ago, we sent you an email message informing you of an upcoming study. I am a graduate student at Iowa State University pursuing a graduate degree in Agricultural Education. I am working with Dr. Robert Martin on this project. We are conducting a study to determine Iowa agricultural educator's current perceptions of agricultural educators regarding understanding of the differences between agricultural awareness and agricultural literacy.

The link to the questionnaire is: (INSERT SURVEY LINK). Participation consent will be collected prior to beginning the questionnaire.

Your participation in the study is voluntary and you are welcome to withdraw your participation at any time during the study. It will take you approximately 10 minutes to complete this questionnaire. You may skip any questions that you do not feel comfortable answering. Your responses will be held in confidence and used only for statistical purposes.

Please consider participating in this study. The focus of this study is an assessment of the understanding of the concepts of agricultural awareness and agricultural literacy as perceived by agricultural teachers. It is evident that there is some confusion about the definition of the terms "agricultural awareness" and "agricultural literacy". While it may be difficult for the general public to define the term "agricultural literacy" or "agricultural awareness," private foundations and government agencies have financially supported the idea that there is a need for the general public to have basic understanding of agriculture, the agricultural industry, and its importance to our country and citizens. Across the United States, there are a multitude of organizations working to educate children and youth about agricultural awareness and literacy. Your input will help to identify the professional educators understanding of the terms agricultural awareness and agricultural literacy in Iowa and to develop definitions for agricultural awareness and literacy based on the data generated.

Please watch for an email from us in the coming days. If you have questions or comments please contact Ashley Batts by email at [anbatts@iastate.edu](mailto:anbatts@iastate.edu) or by phone at (515) 294-0896.

Thank you in advance.  
 Ashley Batts  
 Graduate Research Assistant  
 515-294-0896  
[anbatts@iastate.edu](mailto:anbatts@iastate.edu)

Dr. Robert Martin  
 Professor  
 515-294-0896  
[drmartin@iastate.edu](mailto:drmartin@iastate.edu)

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

## CONTACT 3

[Date]

Dear Agriculture Education Teacher:

Last week you were invited to participate in a survey designed to identify Iowa agricultural educator's current perceptions of agricultural educators regarding understanding of the differences between agricultural awareness and agricultural literacy. Recently, a link to a web-based questionnaire was sent to you via email. We have not yet received your responses to the questionnaire. Your participation in this study is very important to us.

The link to the survey is: (INSERT SURVEY LINK)

If you have already completed and submitted the questionnaire, please accept our sincere thanks. Otherwise, please complete the questionnaire and submit it. It will take you approximately 10 minutes to complete this questionnaire. Participation consent will be collected prior to beginning the questionnaire.

Please direct any questions or concerns to Ashley Batts at [anbatts@iastate.edu](mailto:anbatts@iastate.edu) or by calling (515) 294-0896.

Your assistance is greatly appreciated.

Sincerely,

Ashley Batts  
Graduate Research Assistant  
515-294-0896  
[anbatts@iastate.edu](mailto:anbatts@iastate.edu)

Dr. Robert Martin  
Professor  
515-294-0896  
[drmartin@iastate.edu](mailto:drmartin@iastate.edu)

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

## CONTACT 4

[Date]

Dear Agriculture Education Teacher:

Two weeks ago, you were invited via email to participate in a survey designed to identify Iowa agricultural educator's current perceptions of agricultural educators regarding understanding of the differences between agricultural awareness and agricultural literacy. We have not yet received your responses to the questionnaire. If you have already completed and submitted the questionnaire to us prior to receiving this postcard, please accept our sincere thanks. Otherwise, please complete the questionnaire and submit it. It will take you approximately 10 minutes to complete this questionnaire. Your participation in this study is very important to us.

The link to the survey is: (INSERT SURVEY LINK). Participation consent will be collected prior to beginning the survey.

Please direct any questions or concerns to Ashley Batts at [anbatts@iastate.edu](mailto:anbatts@iastate.edu) or by calling (515) 294-0896.

Your assistance is greatly appreciated.

Sincerely,

Ashley Batts  
Graduate Research Assistant  
515-294-0896  
[anbatts@iastate.edu](mailto:anbatts@iastate.edu)

Dr. Robert Martin  
Professor  
515-294-0896  
[drmartin@iastate.edu](mailto:drmartin@iastate.edu)

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.



CONTACT 5 (Final contact)

[Date]

Dear Agriculture Education Teacher:

This is our final attempt to contact you and ask you to participate in a survey designed to identify Iowa agricultural educator's current perceptions of agricultural educators regarding understanding of the differences between agricultural awareness and agricultural literacy.

Recently, a questionnaire was sent to you via email and a reminder postcard was mailed to you encouraging your participation. We have not yet received your response to the questionnaire. Please consider completing the instrument. Your participation in this study is very important to us.

If you have already completed and submitted the questionnaire, please accept our sincere thanks. Otherwise, please complete the questionnaire and submit it. It will take you approximately 10 minutes to complete this questionnaire. The following is the link to the questionnaire: (INSERT SURVEY LINK). Participation consent will be collected prior to beginning the questionnaire.

Please direct any questions or concerns to Ashley Batts at [anbatts@iastate.edu](mailto:anbatts@iastate.edu) or by calling (515) 294-0896.

Your assistance is greatly appreciated.

Sincerely,

Ashley Batts  
Graduate Research Assistant  
515-294-0896  
[anbatts@iastate.edu](mailto:anbatts@iastate.edu)

Dr. Robert Martin  
Professor  
515-294-0896  
[drmartin@iastate.edu](mailto:drmartin@iastate.edu)

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, [IRB@iastate.edu](mailto:IRB@iastate.edu), or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

**APPENDIX C****Respondents Comments Regarding Agricultural Awareness and Agricultural Literacy**

**What general comments do you have regarding agricultural awareness and agricultural literacy? List comments in the blank space.**

1. Ag awareness is when you have a basic understanding of where your food, fiber, and natural resources come from. Whereas, literacy is the application of knowledge in the food, fiber, and natural resource sector.
2. I strongly believe that as society moves farther and farther from agrarian roots, AgEd becomes much more important.
3. Preparing for the future needs of food and fiber in the world will take first awareness then literacy to meet.
4. Agricultural awareness is mandatory. Agricultural literacy is a benefit.
5. I have no idea what you are trying to accomplish with this survey.
6. Words like "awareness" and "literacy" do not just have one meaning; hence, the questionnaire strikes me as "strange." When taken out of context, I have concerns about the validity of the questions. Have we done a great service to the agriculture industry by defining the two terms? Probably not.
7. Have to have one to support the other
8. Literacy is developing a deeper knowledge and understanding; where awareness is very general ag education. Awareness is the basic "a ha" moment. Agriculture awareness is a basic knowledge of concepts such as knowing that your milk comes from a dairy cow not just a grocery store.
9. Literacy is understanding that one can apply to real world-awareness is knowing but not really understanding and most likely not being able to apply to real world some of the time.
10. Awareness - realization that ag is relevant and around us in many ways. Literacy- understanding and gaining knowledge of agriculture around us in many ways.
11. I feel people use them interchangeable without giving it a second chance. To me Ag awareness is a general knowledge of agriculture. Ag literacy starts to work on specific words, functions, and processes that occur in agriculture.
12. Agriculture Awareness becomes extremely important as we need to educate the public about the importance of agriculture and its role in our lives. We are able to do this through our agriculture education programs and FFA by providing our students and

members with the knowledge they need, agriculture literacy, to increase the agriculture awareness of the public.

13. Many of the above could have been both. I am not sure how to separate them in some cases.
14. Ag awareness in my mind deals with very basic knowledge and association of agriculture where being literate about agriculture involves a great depth and breadth of agriculture practices, principles, and skills.
15. Since less and less people have a basic knowledge of Agriculture, someone has to teach them about it. Should I call this the basic common sense of Agriculture? Literacy is gaining those concepts that enhance your knowledge in an agriculture area. Should I say getting you ready for the world of work?
16. Literacy is more in depth
17. Both are very important. Ag Awareness is going to attract the masses, ag literacy for those truly interested in the functions of agriculture. Both play vital roles in the ag industry. The more who know the truth about even a small facet of the industry is very important.
18. A lot of technicalities listed in the survey above. Keep it simple: Awareness is more about developing consumer intelligence and literacy is more about developing an understanding to be involved in a facet of production or processing.
19. To me, ag awareness is knowing about ag in general and ag literacy is a detailed understanding and synthesis of that knowledge.
20. We, as agricultural educators and "advocates" (advocates for agriculture) need to start working harder to increase agricultural awareness. Students that are already involved in agriculture, and those people that are instructing them are doing a great job with agricultural literacy and many of the people I have
21. Encountered in the agricultural world know what they are talking about as far as having an understanding of agriculture is concerned. The problem I see is with the number of people who are not even aware of what agriculture is and how important it is to our society. This is the part that really needs to be worked on -promoting agricultural awareness to people who don't understand that they are regularly exposed to the necessity, importance, and benefits of agriculture.
22. All too often we have agricultural program for youth and even adults and we put it under the umbrella of being agriculturally literate because we either take for granted that those teaching or advising are agriculturally literate OR people in charge or advising may themselves not be agriculturally literate but think they are. Our assumptions may be that

because so and so grew up on a farm they must be agriculturally literate when that may not be the case.

23. I believe awareness is having the general public be aware of what agriculture industry includes and provides to humans. Literacy is a more complex study of the area.