KNOWLEDGE, PERCEPTIONS, AND EXPERIENCES OF SECONDARY AGRICULTURE TEACHERS AND 4-H AGENTS REGARDING GLOBAL AGRICULTURAL ISSUES

By

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To my family, for all their continued love and support

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Abstract of Thesis Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Master of Science

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The purpose of this study was to assess the international experiences, knowledge, attitudes, and beliefs of secondary agriculture teachers and 4-H extension agents regarding global agricultural issues. The research utilized survey design methodology. The sample consisted of secondary agriculture teachers nationwide who were part of the National FFA Organization's Agricultural Career Network and 4-H extension agents nationwide who were members of the National Association of Extension 4-H Agents. Data collected were knowledge, attitudes, beliefs, experiences, and demographic data (as measured by a modified version of *The International Agricultural Awareness and Understanding Survey* (Wingenbach et al., 2003)).

Descriptive statistics, correlations, and T-tests were used to determine if significant differences existed between agriculture teachers and 4-H agents and if relationships existed between the variables of interest. The analysis revealed that agriculture teachers and 4-H agents differed significantly on several experiences. Differences were also found between select experiences and knowledge, attitudes, and beliefs. No relationships were found between demographic variables and knowledge,

attitudes, and beliefs. Based on these findings, recommendations were given for agriculture teacher and 4-H extension agent educators, in-service educators, and future research.

CHAPTER 1
INTRODUCTION

Background

The world has become increasingly interconnected through the availability of lower cost transportation and communication and the increase in computers (Schuh, 1989). As other nations have gained a foothold in the international market, the U.S. has lost economic power (Schuh, 1989). In order to remain competitive in a global marketplace, agriculture students, the future agricultural workforce, must understand the international system of politics, institutions, and economies, particularly agriculture economies, and cultures other than their own (Schuh, 1989).

Globalization in Agriculture

Schuh (1989) pointed out that “most students will find themselves working for (or owning) farms and firms that export to…or that compete with…other countries” (p. 8). Globalization of agriculture continues to increase, and employers have been demanding employees with global perspectives (Acker, 1999). Globalization refers to the development of an increasingly integrated global economy. Many agricultural problems have a global nature. The integration of international perspectives in an agriculture program can increase students’ understanding and cultural awareness, and help them comprehend the magnitude of these global agricultural problems (Shoulders & Myers, 2010). The continued expansion of agriculture has led to a need for globalized curricula. The term globalization has often been ill-defined, but for the purpose of this study globalization refers to the integration of a global component into the curriculum.

History of Global Education

Educators have been discussing global education for over 40 years. The term "global education" first became popular in the 1960s, and described "globalized curriculum centered on the study of human beings in their earthly habitat" (Becker, 2002, p. 51). The use of the term *global education* signaled the change from teaching about differences to teaching about the "common fate" of humanity (Becker, 2002, p. 51). In 1976, the availability and quality of global education materials had improved, but integration was still lacking (Becker, 2002). In 1979, the National Commission on Foreign Languages and International Studies emphasized the need for global awareness and the continued lack of global education (Becker, 2002).

The 1980s had mixed results for global education. Reagan's election brought a more conservative view on global education, while the Danforth Foundation attempted to strengthen integration (Becker, 2002). In the 1990s, globalization was recognized as a major force in the world, and the progress had continued faster than predicted (Becker, 2002). All of these events contributed to the current mindset regarding global education. In 2002, Becker said that although efforts to design national guidelines for global education were underway, and public opinion of global education was high, a gap still existed between actual world condition and the instruction offered. Many authors and educators have continued to support global education into the 2000s.

Acker (1989) spoke of the need for "teaching professional agricultural subjects from an international perspective" (p. 13). Teacher and extension agent education programs have lagged behind higher education overall in terms of internationalization, which has led to teachers and agents who may be unready to incorporate international issues (Zeichner, 2010). Acker (1989) specifically addressed the need for educators to

see an issue from multiple perspectives and to build international issues into curriculum materials. In order for U.S. agriculture to maintain a strong presence in the global market, the curriculum used to educate future agriculture workers must be internationalized (Henson & Noel, 1989). Future agriculture workers may often be reached through youth agriculture organizations and agriculture classrooms, such as 4-H, FFA, and secondary agriculture classes.

Formal and Nonformal Agricultural Education

In 2010, 4-H had a total of 6,330,612 participants from kindergarten to post-high school, with 1,553,259 as members of 4-H clubs (U.S. Department of Agriculture, 2010). The National FFA Organization (2011) reported over 800,000 students enrolled in agricultural education programs from seventh grade to adult classes taught by over 11,000 agriculture teachers. The scope of these organizations combined has been extensive, reaching hundreds of thousands of agriculture students throughout the United States and its territories. Both 4-H and FFA have offered international travel opportunities, though they have been almost exclusively targeted at *postsecondary* students. Students in secondary agricultural education programs have had little opportunity to gain an international perspective unless their educator chose to make opportunities available to them.

Reaman (1990) addressed the attitudes and perceptions of 4-H agents regarding 4-H international programs, along with clientele participation. Similarly, in 1994, Ibezim and McCracken examined the extent of internationalization and factors contributing to internationalization in twelve North Central states. Ibezim and McCracken (1994) found that only 58% of participating teachers in the selected states taught international agricultural issues in their classes. Despite this percentage, Speed, Kent, and Byrom

(1998) found that eight out of ten 11-16 year old students felt that learning about global issues was important and would influence their life choices (as cited in Hicks, 2003).

Rationale

Today's graduates must be prepared to work in a global economy (National Research Council, 2009). The AAAE National Research Agenda Priority Three (2011) called for a "sufficient scientific and professional workforce that addresses the challenges of the 21st century" (p. 9). Priority Three specifically mentioned the need for a diverse workforce that meets the higher capacity demands of a global economy and understands agriculture in a global context (Doerfert, 2011). Not all high school agriculture students will go on to college, so incorporating international perspectives can give them a leg up as they seek employment. Agricultural education has a responsibility to prepare students for employment in the globally aware workforce. The first step to preparing these students has been determining factors associated with extent of globalization of educational activities. This study assessed the knowledge and attitudes of educators, both teachers and 4-H agents, towards international agriculture issues in the hopes that this information could later be used to increase the amount of globalized instruction that students receive.

Problem Statement

The problem this study investigated was that formal and nonformal agricultural education programs need to prepare students for employment in a global economy. Global education has been discussed since the 1960s, but in 1994, only 58% of agriculture teacher integrated global issues into their courses (Becker, 2002; Ibezim & McCracken, 1994).

Purpose and Objectives

The purpose of this study was to assess the international experiences, knowledge, attitudes, and beliefs of secondary agriculture teachers and 4-H extension agents regarding global agricultural issues. The objectives of this study were to determine the:

- Perceptions of agriculture teachers and 4-H agents towards international agricultural issues;
- Knowledge of agriculture teachers and 4-H agents of international agriculture issues;
- International experiences of agriculture teachers and 4-H agents;
- Relationship between teachers and agents perceptions and selected demographics;
- Difference between international experiences and educator knowledge;
- Difference between international experiences and educator perceptions

Significance of the Study

This study was significant due to the increased demand for employees with critical thinking skills and an international mindset. Wingenbach et al. (2003) said that "educators and students alike must increase their awareness levels of global events and their potential impact on agricultural practices worldwide" (p. 32-33). Agriculture teachers and 4-H agents must change with the times to match the increasing globalization seen worldwide. The investigation of current levels of integration and associated factors undertaken by this study should act as a call to action for agricultural educators, by bringing to light ways to improve the value of agriculture programs. Both 4-H agents and secondary agriculture teachers should use this study to determine that the addition of global issues into their curriculum would be an appropriate modification,

resulting in more prepared, employable students. This study should also be significant to teacher and extension agent educators. The factors associated with integration will help teacher and extension agent educators design appropriate course material on integration of global agricultural issues and address potential problems or objections that arise.

Definition of Terms

Knowledge of the following terms will be useful in understanding the meaning and usefulness of this study.

- 4-H AGENT: "Local, regional, state, or national Cooperative Extension staff who work with 4-H youth programs" (http://nae4ha.com, n.d.)
- 4-H: "the largest nonformal educational youth organization in the world; provided in local communities for students aged 5-18 as a program of USDA's Cooperative Extension System" (Phipps et al., 2008, p. 527).
- AGRICULTURAL EDUCATION: "The systematic instruction in agriculture and natural resources at the elementary, middle school, secondary, postsecondary, or adult levels for the purpose of preparing people for entry or advancement in agricultural occupations and professions, job creation and entrepreneurship, and agricultural literacy" (Phipps et al., 2008, p. 527).
- AGRICULTURAL EDUCATOR: "a person teaching agriculture and natural resources and related topics to youth or adults in formal or nonformal settings" (Phipps et al., 2008, p. 527).
- AGRICULTURE TEACHER: "An educator who has responsibility for teaching agriculture and natural resources courses/curricula in schools and community colleges" (Phipps et al., 2008, p. 527).
- ATTITUDE: a mental position with regard to a fact or state (Attitude, n.d.). In this study attitude is defined as a personal feeling or thought about international agricultural issues as measured by a modified version of the International Agriculture Awareness and Understanding Survey (Wingenbach et al., 2003).
- BELIEF: something held as an opinion (Belief, n.d.). In this study belief is defined as a personal opinion about an object as measured by a modified version of the International Agriculture Awareness and Understanding Survey (Wingenbach et al., 2003).

- GLOBALIZATION: “The development of an increasingly integrated global economy” (Globalization, n.d.)

- INTEGRATION: to form, coordinate, or blend into a functioning to unified whole (Integration, n.d.). In this study integration is defined as the discussion, investigation, or other use of international agricultural issues during educational activities.

- INTERNATIONAL: of, relating to, or affecting two or more nations (International, n.d.).

- INTERNATIONALIZATION: “the process of integrating an international dimension into the teaching/learning, research and service functions of a university or college” (Knight, 1994, p. 3). In this study defined as the integration of a global dimension into the educational activities of a formal or nonformal agricultural education program.

Limitations of the Study

This study has several limitations. Contact information was collected for agriculture teachers from the National FFA Agricultural Career Network; however, not all agriculture teachers in the U.S. were included in this frame. Teachers may not have been listed or may have been unavailable due to incorrect or outdated contact information. Additionally, retired teachers or those who have changed careers may still have been listed as advisors. Participating 4-H agents were contacted through the National Association of Extension 4-H Agents. However not all 4-H agents were members of this association. In addition, the survey may have been sent to 4-H agents who were no longer working. This study also measured perceptions experiences at a specific point in time, limiting generalizability to other time periods. These limitations may have reduced the generalizability of the results of this study.

Basic Assumptions

The first assumption was that the respondents answered the questions honestly, and that the questions were understood as intended. Since this survey was assessing

attitudes and beliefs, some respondents may have felt pressured to respond positively to certain statements, despite their personal feelings. These assumptions were addressed by asking respondents to answer honestly, and informing them that survey results will be anonymous.

Summary

The integration of international issues into agricultural education activities has been necessary to create well-rounded students who have been prepared for today's workforce (Marinos & Bruening, 2010). The problem of underprepared agriculture graduates has been detrimental to both agriculture programs and the graduates. By assessing factors associated with the level of integration of international issues in formal and nonformal agriculture programs, this study will help both agricultural educators and teacher educators better prepare for a globalized world. For agricultural educators, this study can be a wakeup call, helping them discover the importance of integration of international issues and personal barriers they may encounter. Determination of the current extent of integration and factors affecting integration can help university faculty in agricultural and extension education address barriers to integration and create educational activities educators would be likely to use.

CHAPTER 2
REVIEW OF THE LITERATURE

This study assessed the international experiences and knowledge, attitudes, and beliefs of secondary agriculture teachers and 4-H extension agents regarding global agricultural issues. These factors were examined to determine the potential relationships and differences between demographic data, knowledge, attitudes, beliefs, and international experiences. This review of the literature used Ajzen's 1991 Theory of Planned Behavior and the Framework for Understanding Teaching and Learning to frame the study (Bransford, Darling-Hammond, & LePage, 2005).

Theoretical Framework

In order to better understand the factors that affect educators' integration of global agricultural issues, Ajzen's Theory of Planned Behavior (1991) was used as a basic framework. In addition to Ajzen's (1991) theory, the Framework for Understanding Teaching and Learning was examined (Bransford et al., 2005). In the Framework for Understanding Teaching and Learning, knowledge of learners and their development in social contexts, knowledge of subject matter and curriculum goals, and knowledge of teaching overlap to create a vision of professional practice (Bransford et al., 2005). These three elements are encircled by the larger concepts of teaching as a profession and learning in a democracy. Educator knowledge of learners and their development in social contexts includes knowledge of how people learn, basic human development, and language (Bransford et al., 2005). Knowledge of subject matter and curriculum goals is "an understanding of the subject matter and skills to be taught in light of the social purposes of education" (Bransford et al., 2005, p. 10). Educator knowledge of teaching encompasses content and content pedagogy, techniques to teach diverse

learners, assessment strategies, and classroom management techniques (Bransford et al., 2005). Knowledge of all of these topics is necessary for beginning educators if they are to be effective (Darling-Hammond & Baratz-Snowden, 2005). 4-H extension agents must also possess these three elements in order to be effective educators. 4-H agents often serve as educators for 4-H youth, and must have knowledge of learners, subject matter, and teaching in order to effectively instruct and guide 4-H youth.

Ajzen's (1991) Theory of Planned Behavior is designed to help predict behaviors and demonstrate the effect of attitudes and personality traits on that behavior. In the Theory of Planned Behavior, three main elements affect a person's intention to perform a behavior: attitude towards the behavior, subjective norm, and perceived behavioral control (Ajzen, 1991). Attitude towards the behavior includes the person's perceptions and their positive or negative perceptions of the consequences of the behavior (Ajzen, 1991). The person's subjective norm is their perception of others' beliefs that they should or should not perform the behavior (Ajzen, 1991). Finally, perceived behavioral control is the person's perceived ease or difficulty in performing the behavior (Ajzen, 1991). These three elements lead to the person's intention to perform the behavior, which leads to the behavior (Ajzen, 1991). When the Theory of Planned Behavior and Framework for Understanding Teaching and Learning are combined, the various elements of the Framework for Understanding Teaching and Learning fit into the categories described by Ajzen (1991). The combination of these two models created the conceptual model that guided this study (see Figure 2-1).

Conceptual Model

To investigate the relationships and differences between knowledge, beliefs, attitudes, international experiences, and demographics, possible factors were grouped

into the categories established by Ajzen (1991). The outcome behavior in question was educator integration of global agriculture issues. In the category attitude towards the behavior, possible variables were identified as educator knowledge of, beliefs about, and attitudes toward international agriculture issues. Additionally, experiences with international travel and demographic characteristics were identified as falling into this category. The category of subjective norms included administrative support, availability of educational materials, work environment, the availability of collaboration, and learner interest and response. In the final category, perceived behavioral control, self- efficacy, confidence, student management techniques, time, funds, equipment requirements, knowledge of pedagogy, and knowledge of pedagogy specific to teaching global agriculture issues were identified as possible variables of interest. Many of the possible variables of interest have been investigated in other contexts by other studies. In this study, the variables of interest were narrowed down to educator knowledge, beliefs, and attitudes about international agriculture issues, experiences with international travel, and demographics. These variables were investigated using previous research in the literature review that follows.

Review of Literature

Several factors that fall into the broader categories of attitude towards the behavior and subjective norms have been shown to have an effect on integration of educational innovations. This review of the literature investigated the effects of the variables of interest on both students and educators in various situations.

Attitude towards the Behavior

Educator knowledge of international agricultural issues

Many studies have shown that educators continue to display a lack of knowledge, despite other studies suggesting that high knowledge levels have been linked to increased global perspective, perceptions of relevance, and positive viewpoints of internationalization.

Navarro's (2005) study showed that faculty at two land-grant universities who had more knowledge of international issues perceived curriculum internationalization as more relevant than those with lower knowledge scores. Faculty knowledge was listed as one of several factors that affected participation in curricular reform (Navarro, 2005). In this study, knowledge was found to increase feelings of relevance, and personal relevance increased the motivation to "expand knowledge and increase participation" (Navarro, 2005, p. 40). The factors found to most affect faculty participation in curricular reform were environment and context, administrative support, incentives, resources, development opportunities, personal priorities, knowledge, and perceived needs (Navarro, 2005).

Similarly, educator knowledge has been shown to play a role in global perspectives and positive viewpoints on internationalization. Ibezim and McCracken (1994) found a positive relationship between educator knowledge and level of integration of international issues in agriculture classes.

Student knowledge of international agricultural issues

Students at secondary and postsecondary levels have shown a lack of knowledge of international agricultural issues for decades. Only 47% of high school agriculture students on an FFA study abroad program had received less than one week

of instruction on international agriculture, while another 26% had received no instruction (Conners, 2003). This was despite the fact that in 1994, 58% of agriculture teachers in 12 Midwestern states reported teaching international issues in agriculture (Ibezim & McCracken, 1994).

Michigan State University students in the College of Agriculture and Natural Resources and the College of Communication Arts and Sciences were generally knowledgeable about international agriculture (Moore, Ingram, & Dhital, 1996). However, the students were not knowledgeable about countries that were likely marketing prospects, changes in imports over the last 30 years, benefits of military bases abroad to agriculture, future demand in various countries, population distribution, and major exports from specific countries (Moore et al., 1996). Deficits in these areas could negatively affect the students' careers, and the researchers recommended focusing on world agriculture to increase student knowledge (Moore et al., 1996). Moore et al. (1996) also suggested that students from the surveyed group receive additional international training if they found a job linked to international agriculture markets.

In 2003, Wingenbach et al. found that juniors and seniors at Texas A&M University in the Department of Agricultural Education scored extremely poorly on a knowledge test of international agriculture issues. Only 3% of the students achieved a passing score, 12 questions answered correctly out of 20, on a pretest (Wingenbach et al., 2003). After a semester in one of four department classes, the percentage of passing students rose to only 5.1% (Wingenbach et al., 2003). These startlingly low results indicated that these students likely did not receive adequate instruction regarding international agricultural issues. The results of this study indicated that

students need a broader perspective of international context, and formal education can use education on targeted issues to increase student knowledge and change student beliefs about internationalization (Wingenbach et al., 2003).

Even secondary students at the elite Pennsylvania Governor's School of Agricultural Sciences averaged less than 60% correct answers on assessments regarding people and culture knowledge and agriculture products and policies knowledge (Radhakrishna, Leite, & Hill, 2003). Correspondingly, undergraduate students in an agronomy class at the University of Nebraska had little knowledge of international agriculture but listed several subjects they would be interested in learning about (Mason et al., 1994). College of Agricultural Sciences students at Penn State also indicated that they had very little knowledge of global agricultural export markets and marketing systems (Mamontova & Bruening, 2005). Studies have shown the serious lack of knowledge both undergraduate and secondary students have regarding international agricultural issues.

Beliefs about international agricultural issues

Teacher beliefs have been studied only briefly, but have been shown to impact the implementation of curriculum. The role of teacher beliefs on curriculum implementation was specifically explored in Cronin-Jones' (1991) case study of two science teachers. A grounded theory qualitative technique was used to study two middle school science teachers' implementation of a 20-lesson curriculum over more than six weeks per teacher. The teachers worked at the same school and thus, had a similar teaching environment (Cronin-Jones, 1991). The first teacher's beliefs about student learning, abilities, and discipline hindered implementation of the curriculum in the way in which it was designed to be implemented (Cronin-Jones, 1991). From this

study, four categories of beliefs that affect curriculum implementation were identified: how students learn, the role of the teacher in the classroom, student ability levels, and importance of content topics (Cronin-Jones, 1991). Cronin-Jones (1991) found that teacher beliefs played a large role in implementation and strategy choice when teaching a curriculum.

Attitudes about international agricultural issues

Several studies have found that teachers and students hold positive attitudes regarding global agricultural issues. Cronin-Jones (1991) explored the effect of attitude on curriculum implementation by qualitatively comparing two science teachers. The first teacher did not have an internalized attitude towards the unit topic and had difficulty incorporating attitudinal components into her teaching (Cronin-Jones, 1991). The second teacher had attitudes regarding student learning, assessment, and the relevance and importance of the information that had negative effects on the implementation of the curriculum (Cronin-Jones, 1991).

In Akpan and Martin's (1996) study, agricultural education professors across the United States were found to have the highest positive perceptions of the statement "the total college curriculum should reflect a respect for knowledge of the global community" (p. 66). The professors also agreed that international issues would become important in the next 10 to 20 years (Akpan & Martin, 1996). Despite this high rating and the perceived importance of international studies, the majority of professors reported that they only occasionally or rarely used activities designed to internationalize the curriculum (Akpan & Martin, 1996).

College of Agriculture undergraduates at Iowa State University also had favorable attitudes towards internationalization of the curriculum, as long as no

additional course requirements were added (Sammons & Martin, 1997). Interestingly, data were collected just two years prior regarding faculty perceptions regarding the infusion of a global perspective in the College of Agriculture at Iowa State University. In 1995, 52.2% of faculty members indicated that they were adding a global perspective to their teaching (King & Martin, 1995). However, the activities being used to add global perspectives to the courses were identified as debate and/or discussion, which the researchers felt did not provide adequate depth or frequency (King & Martin, 1995). The fact that only a few activities regarding internationalization were being used in each course could explain why student perceptions were not strongly positive. In concordance with other data, faculty believed that internationalization was important, that coursework should provide students with an international agriculture knowledge base, and that the College of Agriculture lacked a global perspective at the time (King & Martin, 1995).

Similarly, undergraduate students in the College of Food, Agricultural, and Environmental Sciences at The Ohio State University were found to have a moderate global perspective and a positive attitude towards cultural diversity (Zhai & Scheer, 2004). In this study, global perspectives were shown to have a high positive relationship with attitudes towards cultural diversity (Zhai & Scheer, 2004). Participants reported that their main sources of information about other countries were newspapers or magazines, televisions, radio news, and books (Zhai & Scheer, 2004). From this study, Zhai and Scheer (2004) recommended that students' moderate global perspectives be promoted through coursework, and colleges of agriculture work to give their students international and multicultural experiences.

Despite the interest shown by undergraduate students, a study by Elliot and Yanik (2002) concluded that urban high school students did not place a high value on international agricultural issues. The study focused on freshman students at a single urban high school and assessed their attitudes regarding international agricultural issues (Elliot & Yanik, 2002). Despite the fact that the students agreed with two-thirds of the statements, the statements were not rated as highly important (Elliot & Yanik, 2002). Elliot and Yanik (2002) concluded that without a concerted effort to promote an international focus, student attitudes reading international agricultural issues would remain marginal.

In a survey by Ibezim and McCracken (1994), cultural awareness and teacher attitude were identified as having positive relationships with integration of internationalized agriculture curriculum. Reaman (1990) found that 4-H agents who possessed a positive attitude towards international programs were more likely to be involved in those programs, and 4-H professionals had an overall positive attitude regarding 4-H international programs. This trend is unsurprising considering the results of Navarro's (2005) study and Ibezim and McCracken's (1994) findings. Additionally, those agents already involved in 4-H's international programs had more positive perceptions of the programs than those who were not involved (Reaman, 1990). This thesis suggests that the trend of knowledge and experience being positively related to attitudes regarding internationalization holds true across both formal and non-formal education.

In 1995, Hossain, Moore, and Elliot investigated the attitudes of Michigan agricscience teachers regarding internationalization of their curriculum. Overall,

agricscience teachers in Michigan showed a favorable attitude towards internationalization of their curriculum (Hossain et al., 1995).

A 1999 study of Pennsylvania Extension educators found that they had an overall positive attitude towards diversity in 4-H/youth development programming (Ingram, 1999). Over 75% of respondents agreed that 4-H youth should learn about other cultures, and that learning about other cultures should be an important part of 4-H (Ingram, 1999). Additionally, 85.5% of responses to an open-ended question, “Learning about different cultures should be an important part of the 4-H/youth development program,” were supportive (Ingram, 1990, para. 22). Ingram (1999) concluded that extension professional viewed learning about different cultures as a way for youth to grow and develop. Numerous studies have shown that educators and students alike have positive attitudes towards global agricultural issues.

Experiences with international travel

Experience with international travel has been shown to have a positive effect on perceptions of international agricultural issues. However, only 1.3% of agriculture students study abroad, the lowest percentage of any group measured (Institute of International Education, 2011).

In the study conducted by Radhakrishna et al. (2003) on secondary students, those who had participated in the International 4-H Youth Exchange (IFYE) program had higher scores than those who had not on both portions of the knowledge test. From this study, the researchers concluded that participation in global activities increased global awareness and recommended that lessons be presented in a global context (Radhakrishna et al., 2003). Boyd et al. (2003) also assessed the impact of the IFYE program on the attitudes towards other cultures and the global awareness of

participants. Statistically significant positive changes were found in participant self-ratings of cultural sensitivity, interest in global events, and involvement in community events (Boyd et al., 2003). The IFYE participants were also found to agree that the IFYE program was worthwhile and continued to impact their lives after the program ended (Boyd et al., 2003). From these results, Boyd et al. (2003) recommended that IFYE be more enthusiastically promoted by extension agents, and that more teens be encouraged to participate in this “life changing” experience (para. 27).

In Sammons and Martin’s (1997) study of Iowa State University undergraduates, very few participants in the study had international experience, except for foreign language classes (Sammons & Martin, 1997). In this study assessing attitudes of internationalization, participation in international activities had a significant, positive effect on student perceptions (Sammons & Martin, 1997). From these results, Sammons and Martin (1997) recommended that the College of Agriculture internationalize existing courses and encourage student participation in international activities.

Despite literature touting the benefits of study abroad programs, undergraduate College of Agricultural Science students at Penn State were the least interested in participating in study abroad (Mamontova & Bruening, 2005). The item rated as most interesting was going to an international restaurant to engage with different cultures, however, fewer than half of the students had actually engaged in this activity (Mamontova & Bruening, 2005). Overall, Mamontova and Bruening (2005) concluded that despite the perceptions of international experience as highly valuable, students had not participated in many international activities. The researchers suggested increasing

international curricula offered and emphasizing agriculture in a global context (Mamontova & Bruening, 2005).

The effect of internationally focused courses on undergraduate College of Agriculture students at Montana State University was examined to identify perceived benefits and the long-term impacts of enrollment (Bruening & Frick, 2004). Three internationally focused courses were evaluated for the study; each course included a travel component to the country or countries of major discussion in the class (Bruening & Frick, 2004). Participants were given a pre-travel and post-travel survey after completion of the course (Bruening & Frick, 2004). As a whole, the students indicated they had gained a better understanding of culture and felt the classes created a safe environment for learning about international agriculture (Bruening & Frick, 2004). They were strongly supportive of participation in future study abroad programs for other students and said that their college experience was enhanced by their participation (Bruening & Frick, 2004). From these positive reactions, Bruening and Frick (2004) recommended that internationally focused courses continue to be offered, and that Montana State University should find a way to integrate these students' experiences and knowledge into other courses. More broadly, Bruening and Frick (2004) suggested that all agriculture graduates should possess international competency upon graduation.

A study of 50 teachers who participated in an 8 to 15 week overseas student teaching experience demonstrated the impact international experience can have (Cushner & Mahon, 2002). The participants responded to questions about the effect the overseas student teaching had on their personal and professional lives. Student teachers responded that their beliefs about the world changed, and they developed

more empathy and trust (Cushner & Mahon, 2002). Additionally, several students mentioned using their international experiences in their teaching, in order to help students gain a multicultural and global perspective (Cushner & Mahon, 2002). Overall, the students became more global-minded and open to diversity, characteristics that may lead to more globally-minded teaching practices (Cushner & Mahon, 2002).

As in other studies, international travel was positively linked to the support of curriculum internationalization by Iowa State University faculty (King & Martin, 1995). From these results, King and Martin (1995) recommended that the College of Agriculture at Iowa State University work to internationalize the curricula, encourage faculty to travel abroad, and provide workshops to help faculty develop strategies for teaching international agricultural issues. By the same token, agricultural education professors who had visited a foreign country responded more positively to an internationalized curriculum than those who had not, and longer durations were positively related to higher perceptions (Akpan & Martin, 1996). Additionally, 4-H professionals in Pennsylvania who had international experience had a more positive attitude towards 4-H's international programs than those without international experience (Reaman, 1990).

Despite the strong support for international travel, most participants in the survey by Wingenbach et al. (2003) watched international television programs, while the smallest number participated in work experience or International 4-H Youth Exchange programs. Additionally, students in this study believed they could learn more about international agricultural issues from a vacation or international television show than they could from interactions with exchange students (Wingenbach et al., 2003). This

study showed the lack of perspective many students had, and Wingenbach et al. (2003) recommended using formal education to broaden students' perspectives. Despite some conflict, the positive relationship between travel abroad and intercultural perspectives has been a strong theme throughout the literature on internationalization of agricultural education (Schuerholz-Lehr, 2007).

Demographics

Selected demographic characteristics have been shown to have an effect on other factors, such as attitudes, beliefs, and level of integration of global agricultural issues. In a 2007 review of literature, Schuerholz-Lehr found that despite the sometimes conflicting definitions of global-mindedness, several traits were associated with global-mindedness across the research. Positive relationships have been found between teacher age, level of formal education, and years teaching and level of integration (Ibezim & McCracken, 1994).

In the study by Hossain et al. (1995) on the attitudes of Michigan agricscience teachers regarding internationalization, younger teachers had more favorable attitudes than did older teachers (Hossain et al., 1995). Also positively associated with attitudes were the factors of memberships in professional organizations, cosmopolitanism, reading of the *Agricultural Education Magazine*, and participation in national seminars (Hossain et al., 1995). In light of these results, Hossain et al. (1995) made recommendations for teachers to use when introducing new internationalized curriculum, but concluded that overall, agricscience teachers in Michigan were willing to internationalize their programs.

Many studies indicated that females were more world-minded than males, though a few studies did not show this relationship (Schuerholz-Lehr, 2007). Zhai and Scheer

(2004) found that female students had a significantly higher global perspective and a more positive attitude towards cultural diversity.

Subjective norms

Little research has been done on subjective norms such as administrative support, state/national standards, curriculum availability, student interest/response, school environment, and availability of collaboration despite the effect these factors may have on other factors and on integration of global agricultural topics. In 2005, Navarro found that the factors that most affected faculty participation in curricular reform were environment and context, administrative support, incentives, resources, development opportunities, personal priorities, knowledge, and perceived needs. Previously, Ibezim and McCracken (1994) found that the five best predictors of integration were teacher attitude, level of formal education, use of visuals, use of curriculum guides, and mass media as a highly important information source.

Curriculum guides were found to have no effect on attitudes in the 2005 study by Hossain et al. Teachers who were provided with an instruction manual on internationalization did not have significant differences in attitudes from those who were not given a manual (Hossain et al., 1995). Availability of curriculum guides may also present an issue. At the middle school level, of the 14 states that had a core curriculum for middle school agriculture, only three included international agriculture (Rossetti & McCaslin, 1994). Lack of a clearly defined project was listed as a major barrier to adoption of a global outlook in 4-H by Pennsylvania county 4-H agents (Reaman, 1990).

Undergraduate agronomy students at the University of Nebraska showed an interest in learning about agricultural concepts of the future, international trade and marketing, environmental issues, and crop production in foreign countries (Mason et al.,

1994). Mason et al. (1994) concluded that students in these agronomy courses did not have sufficient knowledge of international topics, and an effort should be made to include topics of interest to the students in the curriculum in order to gain an international dimension.

Summary

Studies have shown that despite the reported positive attitudes of educators and students regarding internationalization of educational activities and global education, there is still a serious lack of knowledge and integration. Without a solid knowledge base, educators may lack the skills or confidence to incorporate new material, such as international issues, into the curriculum. It is clear that many studies agree that increased knowledge leads to increased participation, feelings of relevance, and integration of new topics and tools. The fact that several studies reported students' main sources of information regarding international issues as media may indicate that the students are not currently receiving adequate education in international issues. In addition to knowledge, several studies have indicated a link between international experience and positive beliefs and attitudes towards global education, or internationalization of the curriculum. Additionally, many participants who had positive attitudes and beliefs regarding international issues shared the view that internationalization of the curriculum is important. This could indicate that educators with more global perspectives are more likely to have positive attitudes towards educational activities that promoted cultural diversity. This study investigated the relationships between the selected variables of knowledge, attitudes, beliefs, international experiences, teaching standards, and demographics of secondary agriculture teachers and 4-H extension agents.

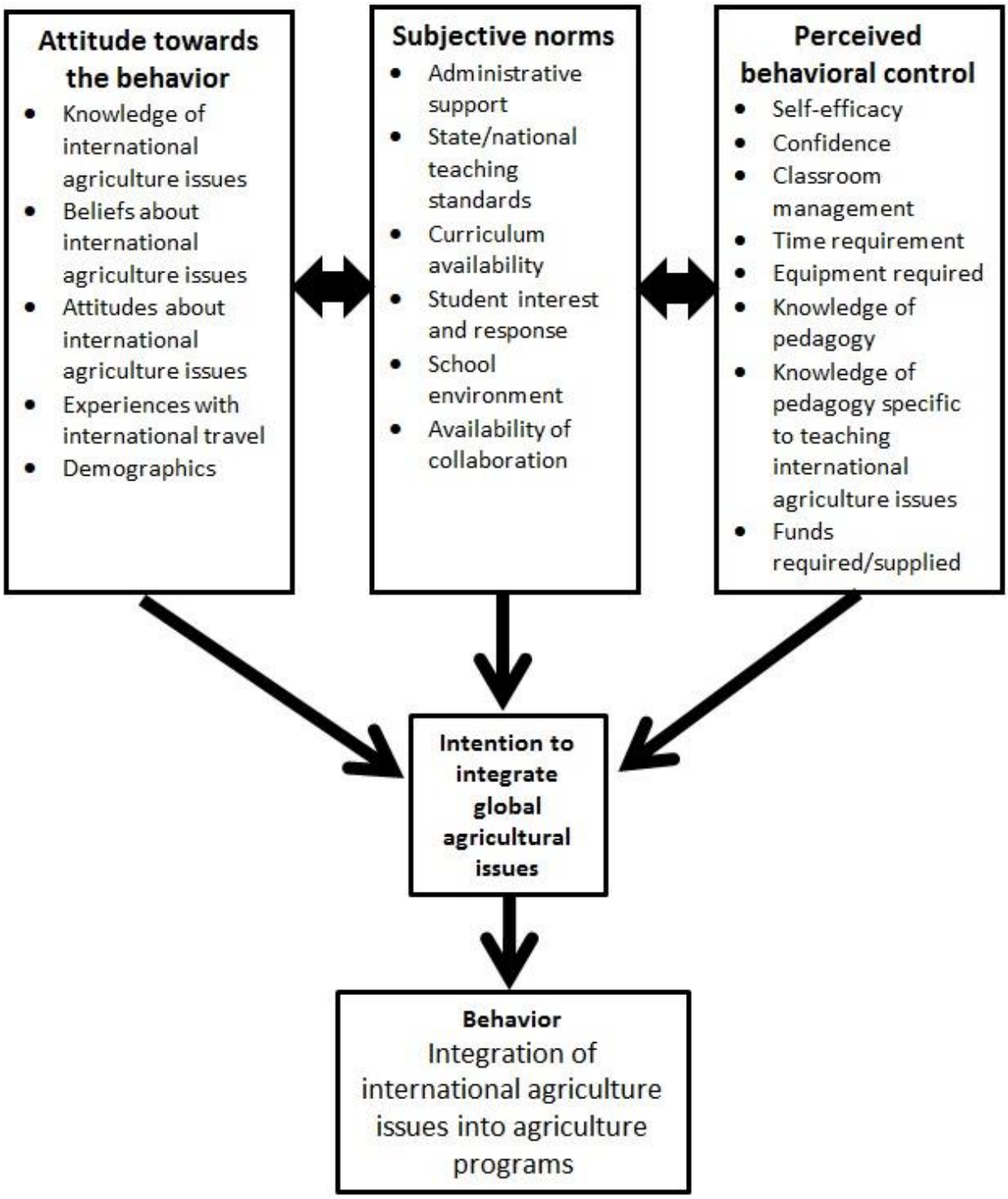

Figure 2-1. Conceptual Model for examining factors associated with integration of international agricultural issues into secondary agriculture and 4-H programs (adopted from Ajzen, 1991).

CHAPTER 3
METHODOLOGY

The purpose of this study was to assess the international experiences, knowledge, attitudes, and beliefs of secondary agriculture teachers and 4-H extension agents regarding global agricultural issues. Additionally, this study examined the relationships and differences between educator demographics and knowledge, perceptions, and extent of globalization. Chapter 3 outlines the research design, population and sample, instrumentation, data analysis, and data collection used in this study.

Research Design

The research design was a non-experimental quantitative design utilizing descriptive survey methodology. The survey was distributed through email due to the large sample size, low cost, and easy availability of contact information. Descriptive survey methodology was chosen due to the ability of the researcher to assess attitudes and beliefs of the participants (Ary et al., 2010). The variables of interest included educator knowledge, beliefs, and attitudes about global agricultural issues, experiences with international travel, and demographics.

Ary et al. (2010) identified five threats to external validity: selection-treatment interaction, setting-treatment interaction, pretest-treatment interaction, subject effects, and experimenter effects. Selection-treatment interaction is also referred to as non-representativeness, and was controlled by random sampling of the populations of interest (Ary et al., 2010). Setting-treatment interactions were controlled for by administering the survey online. Each participant completed the survey in a different setting (Ary et al., 2010). In order to prevent pretest-treatment interaction, a design

without a pretest was selected (Ary et al., 2010). Subject effects may occur due to the subject matter and the use of sampling, which may influence how the respondents answer the survey (Ary et al., 2010). Experimenter effects occur when the attitude of the experimenter affects the outcomes of the experiment (Ary et al., 2010). Experimenter effects were controlled using a pilot test and a panel of experts to analyze the modified survey instrument before distribution to eliminate any researcher bias.

Internal validity is a basic requirement to draw conclusions from research (Campbell & Stanley, 1963; as cited in Ary at al., 2010). Eleven threats to internal validity were listed by Ary et al.: history, maturation, testing effect, instrumentation, regression, selection bias, mortality, selection-maturation interaction, experimenter effect, subject effect, and diffusion (2010). History, maturation, testing effect, instrumentation, statistical regression, mortality, selection-maturation interaction, and diffusion were controlled for by the research design. Selection bias was addressed by the use of random sampling of the population, so that any differences between those selected to participate and those not selected was chance (Ary et al., 2010). The experimenter effect was controlled through the use of an online survey that was reviewed by a panel of experts and pilot tested before distribution. The subject effect may occur due to the subject matter and use of sampling.

Dillman, Smyth, and Christian identified four types of survey error: coverage, sampling, nonresponse, and measurement (2009). Coverage error is defined as when all member of the population do not have an equal chance of selection, and when the excluded members are different from the included member on measures of interest (Dillman et al., 2009). Email addresses that were provided by the teacher or 4-H agent

to the National FFA or the NAE4HA were used as contacts. Since the email addresses were provided by the participants and linked with the names, it should reduce the number of unusable contacts and duplicates (Dillman et al., 2009). Sampling error is when the survey's precision is limited due to the use a sample rather than a census (Dillman et al., 2009). The effects of sampling error were limited in this study by taking a sample size large enough to give the desired power. Nonresponse error occurs when participants who respond are different in a way important to the study from those who do not respond (Dillman et al., 2009). In order to reduce nonresponse, permission was obtained from the National FFA and NAE4HA to use the organization's name on contact emails. This endorsement from the professional organizations should have increased response rates through the establishment of trust (Dillman et al., 2009). Additionally, an attempt was made to contact nonrespondents by email or by phone in order to compare them to respondents to determine if any significant differences existed (Dillman et al., 2009). Because of the small number of nonrespondent data collected, early and late respondents were compared to determine if any differences existed between the groups. Measurement error is when answers are inaccurate or imprecise, often due to poor question wording or other design issues (Dillman et al., 2009). A pilot study and a panel of experts were used to reduce measurement error and ensure clear wording.

Population and Sample

The population of interest was all secondary agriculture teachers and 4-H extension agents in the U.S. In order to contact agriculture teachers, the 2012 Agricultural Careers Network database directory was obtained from the National FFA Organization. In November 2011, the National FFA Organization recorded more than 11,000 agriculture teachers in the U.S. The advisor contact list was obtained at the end

of August 2012, and listed about 11,000 advisors. 4-H Extension agent contact information was obtained from the National Association of Extension 4-H Agents (NAE4HA). Contact information was acquired from the NAE4HA at the end of August 2012, and listed 2,769 active 4-H extension agent members.

A simple random sample of each population was used because simple random sampling minimizes researcher bias, and due to the large sample sizes drawn, the likelihood that the sample is not representative is minimized (Ary et al., 2010). Sample size was determined using a desired precision of five percent, a 95% confidence level, and a variability of 50%, indicating maximum variability (Israel, 1992). Using Israel's (1992) recommendations, the desired sample size was determined to be 385 agriculture teachers, and 333 4-H extension agents (Israel, 1992). In addition to this sample size, an extra 80% of the required 385 agriculture teachers were sampled, and an extra 64% of the required 333 4-H agents. This was due to hypothesized response rates for agriculture teachers of 25%, and of 4-H agents of 66%, based on prior studies (Ibezim & McCracken, 1994; Reaman, 1990; Shoulders, 2012). The increased sample size helped compensate for nonrespondents and ensure a suitable sample size. In total, 2,000 agriculture teachers and 1,000 4-H agents were sampled. Of the 2,000 agriculture teachers, 237 had invalid email address, and 7 were no longer teaching agriculture, reducing the sample size to 1,756. Of the 1,000 4-H agents, 55 had invalid email addresses, and 18 did not fit the criteria of working with youth or were no longer agents, reducing the sample size to 927.

Instrumentation

This study was conducted using a modified version of the International Agricultural Awareness and Understanding Survey (Wingenbach et al., 2003, See

Appendix A). Section one of the survey used 20 multiple choice questions to assess the knowledge agriculture teachers and 4-H extension agents had about international agricultural issues. Section two measured attitudes and section three measured beliefs of participants towards international agricultural issues. Section four collected information regarding international experiences of respondents and contained three open-ended questions regarding integration. Section five collected demographic data from each participant. Using the Food and Agriculture Organization of the United Nations (FAO) list of global issues, each question was evaluated for relevance. Questions that were deemed no longer relevant were replaced with facts from the FAO. Questions that were relevant were updated to reflect current trends and statistics. Each section was reviewed by a panel of experts and pilot tested after modification. To establish content validity four experts were asked to provide feedback on sections one, two, and three of the modified instrument. The expert panel included Dr. Gary Wingenbach, a professor at Texas A&M University and part of the Norman Borlaug Institute for International Agriculture, Dr. Kristin Davis, executive secretary of the Global Forum for Rural Advisory Services, Dr. Pete Vergot, District Extension Director for University of Florida IFAS Extension, and Dr. Walter Bowen, Director of International Programs for the University of Florida IFAS.

In order to establish face validity, pilot test participants were asked to not only answer the questions but indicate any areas that needed clarification or rewording. The instrument was pilot tested on 32 junior and senior undergraduate agricultural education students. Section one, knowledge about international agricultural issues, used 20 multiple choice questions to assess educator knowledge. These questions were

updated to reflect current trends in global agriculture. The pilot study recorded a KR-20 of 0.42. The low reliability can be attributed to the high difficulty of the questions and relatively small number of questions (Ary et al., 2010). The average score of the pilot test participants was a 42%, or 8.5 questions correct. Section two measured attitudes about international agricultural issues using 36 six-point Likert scale items. Wingenbach et al. (2003) reported a Cronbach's alpha of 0.95 for this section. The pilot test recorded a Cronbach's alpha for section two of 0.95. Section three assessed beliefs about international agricultural issues using 20 six-point Likert scale questions. A Cronbach's alpha of 0.97 was found for section three (Wingenbach et al., 2003). The pilot test found a Cronbach's alpha of 0.81 for section three. Likert scale items in sections two and three were reworded for clarity when collecting data from educators instead of students. Section four collected information regarding international experiences of respondents. Section five collected demographic data from each participant through five questions, and was updated to reflect variables of interest in the populations under study. Post-hoc reliabilities were also reported after the completion of data collection. A KR-20 of 0.29 was found for the knowledge section. A Cronbach's alpha of 0.96 was reported for the attitudes section, and of 0.85 for the beliefs section.

Data Collection

Participants were contacted through emails provided by the National FFA or NAE4HA using the Tailored Design Method (Dillman et al., 2009). Prenotice emails were sent to both groups in late September 2012. Emails that came back as undeliverable were examined for misspellings and resent the following day. This timing avoided other major events for the participants, such as the beginning of the school year, national association meetings, and major holidays. Email addresses were hidden

so that the emails would not appear as bulk mail. The prenotice email was sent from the researcher's university email address, all subsequent emails were sent through the mailing system provided by Qualtrics. The prenotice email contained information on the purpose of the research, information on the distribution of the survey, a document outlining previous research on integration of global agricultural issues, and researcher contact information (See Appendix C). The first email contact contained information on participant selection, the research purpose, and instructions. The email also contained contact information for questions, and the survey link and access instructions (See Appendix D). The survey was designed on and conducted through Qualtrics.

Four additional contacts were sent when the amount of new survey respondents was no longer increasing (Dillman et al., 2009, See Appendices E, F, G, and H). Contacts were sent at varying times of day and days of the week due to the range of time zones included. Each contact, except for the closing notice, had at least one week between them (Dillman et al., 2009). All contacts were phrased differently, in order to prevent classification of the notices as spam and appeal to different respondents. Additional contacts were sent only to nonrespondents or those who had not finished the survey. Follow up emails contained a renewed request to nonrespondents, directions on accessing the survey, a clickable link, a thank you, and a reiteration of the importance of receiving a response. A problem occurred in Qualtrics due to a limit on the number of emails that could be sent, resulting in a delay between the first reminder emails and subsequent emails for agriculture teachers. A prenotice email was sent to agriculture teachers on September 24, 2012. Agriculture teachers were sent an initial invitation email on September 26, 2012. Follow-up emails were sent to nonrespondent agriculture

teachers on October 2, Oct 26, November 5, and November 7. 4-H agents received a prenotice email on September 27, 2012. An initial invitation email was sent to 4-H agents on October 1, 2012. Follow-up emails were sent to 4-H agents on October 16, October 25, November 5, and November 7. Upon closing on November 7, of the 927 4-H agents eligible to take the survey, 324 had completed the survey, and an additional 204 had begun or partially completed the survey. Of the 1,756 eligible agriculture teachers, 417 had completed the survey, while an additional 284 had begun or partially completed the survey.

To address non-response, random samples of non-respondents were first contacted by email and asked to complete the survey online, in a Word document, or through a phone interview. Of the 1,057 agriculture teachers who did not respond, a total of 421 different agriculture teachers were contacted through email, eliciting no responses. Of the 402 4-H agents who did not respond, 155 different agents were contacted by email, eliciting three responses. Since the email follow up to non-respondents was not effective, a random sample of non-respondents from each group was contacted by phone with a request to complete the survey over the phone at that time, online, or to schedule a time to take the survey later. Forty-two 4-H agents were contacted by phone, resulting in responses from five additional agents, bringing the total number of 4-H agent non-respondents recorded to eight. Forty-two agriculture teachers were contacted by phone, eliciting seven total responses. A total of 332 responses were collected from 4-H agents, resulting in a response rate of 35.9%. A total of 424 responses were collected from agriculture teachers, resulting in a 24.1% response rate.

Since follow up contacts did not yield enough responses to make a comparison, early and late respondents were compared to determine if there were any significant differences between the groups (Lindner, Murphy, & Briers, 2001). Late respondents were identified as those who replied after the November 5th follow up email. No significant differences were found between early and late respondents in knowledge, perceptions, experiences, or demographic variables.

Data Analysis

After 42 days, the survey was closed and data were analyzed using SPSS 20. Section one, testing respondent knowledge of international agricultural issues, was analyzed using frequencies and percentages. For sections two and three, regarding attitudes and beliefs, means and standard deviations were found in order to determine grand means for both sections. Demographics in section four were analyzed using frequencies and percentages. To address objectives one through three, regarding perceptions, knowledge, and experiences of agriculture teachers and 4-H agents towards international agricultural issues, frequencies and frequency percentages were reported. For the fourth objective, demographics were cross-referenced with perceptions to determine if any significant differences existed using T-tests. The fifth and sixth objectives were analyzed by comparing the each of the international experiences with knowledge and perception scores to determine T-values. Additionally, KR-20 was used to evaluate the reliability of section one, and Cronbach's alpha was used to evaluate the reliability of sections two and three.

Summary

A descriptive survey design methodology was used to collect information on agriculture teacher and 4-H agent knowledge and perceptions of global agricultural

issues, and international experiences. Agriculture teachers were contacted using random sampling from a list provided by National FFA. 4-H agents were contacted using random sampling from a list provided by NAE4HA. A modified version of the survey instrument by Wingenbach et al. (2003) International Agricultural Awareness and Understanding Survey designed in Qualtrics and distributed through email. Data was collected over 42 days for each group, and analyzed using SPSS 20 to run descriptive statistics.

CHAPTER 4
RESULTS

The purpose of this study was to assess the international experiences, knowledge, attitudes, and beliefs of secondary agriculture teachers and 4-H extension agents regarding global agricultural issues. Chapter 1 explained the significance of integration of global agricultural issues into secondary agriculture and 4-H programs. Chapter 1 also listed the objectives of this study, key terms, and limitations. The objectives of this study were to determine the:

- Perceptions of agriculture teachers and 4-H agents towards international agricultural issues;
- Knowledge of agriculture teachers and 4-H agents of international agriculture issues;
- International experiences of agriculture teachers and 4-H agents;
- Relationship between teachers' and agents' perceptions and selected demographics;
- Difference between international experiences and educator knowledge;
- Difference between international experiences and educator perceptions

Chapter 2 presented an overview of the theoretical frameworks and conceptual models used to guide this study. Chapter 2 also presented a review of relevant literature related to each variable from the conceptual model utilized in this study.

Chapter 3 explained the methods used to collect data, the research design, population and sample, instrumentation, data collection, and data analysis.

Chapter 4 presents the results obtained by this study. The results include data on demographics, knowledge, attitudes, beliefs, and experiences for both teachers and agents, and address the objectives of this study.

Agriculture Teachers

Demographics

Respondents were analyzed by the following demographics: gender, years of experience as a teacher or 4-H agent, area in which they do most of their work, and family ancestry. Results can be found in Table 4-1.

Table 4-1 provides the frequency distribution of agriculture teacher respondents' gender, years of experience, area in which they work, and family ancestry. Of the 417 agriculture teachers who completed the survey, 240 (57.5%) were male, 172 (41.2%) were female, and six (1.4%) did not respond. The respondents had an average of 14.5 years of experience, ranging from first year teachers to 49 years of experience. Three hundred thirty (79.1%) of the teachers indicated that they did most of their work in a rural area, 66 (15.8%) indicated suburban, 20 (4.8%) indicated urban, and one (0.2%) did not respond. In terms of ancestry, 387 (90.2%) indicated that they were European/Caucasian, 16 (3.7%) that they were African American, 12 (2.8%) that they were Native American, four (0.9%) that they were Mexican/Latin American, four (0.9%) that they were Asian, three (0.7%) that they were Pacific Islander, two (0.5%) that they were Puerto Rican, and one (0.2%) that they were other Caribbean ancestry.

Table 4-1. Frequencies and percentages of demographic information for agriculture teachers

	f	Percent
Gender (N= 412)		
Male	240	57.5
Female	172	41.2
Years of Experience (N=415)		
Less than 1 year	1	0.2
1-5	109	26.3
6-10	66	15.9
11-15	77	18.6
16-20	48	11.6

Table 4-1. Continued

	f	Percent
21-25	31	7.5
26-30	46	11.1
31-35	30	7.2
36+	7	1.7
Area in which participant works (N=416)		
Rural	330	79.3
Suburban	66	15.9
Urban	20	4.8
Family Ancestry (N=429)		
European/Caucasian	387	90.2
African American	16	3.7
Native American	12	2.8
Mexican/Latin American	4	0.9
Asian	4	0.9
Pacific Islander	3	0.7
Puerto Rican	2	0.5
Other Caribbean ancestry	1	0.2
Arab	0	0

Knowledge

In order to measure knowledge levels, participants were asked to complete a 20 questions multiple choice test. The average percent correct was 42%, or 8 questions of 20. Only 27 (6.5%) agriculture teachers achieved a passing score of 12 questions correct of 20, as defined by Wingenbach et al. (2003). Correct answers are bolded in Appendix A. Table 4-2 shows the frequencies and percentages of correct answers given by agriculture teachers on the knowledge assessment.

Table 4-2. Frequencies and percentages of correct knowledge assessment answers for agriculture teachers

Question	*f*	Percent
What is the primary household fuel in Africa and Asia?	331	79.4
Which cereal grain is the basic food for more than half of the world's population?	328	78.7
What country produces the largest volume of swine?	313	75.1
The _____ desert is the world's largest hot desert.	308	73.9

Table 4-2. Continued

Question	*f*	Percent
Which one of the following food nutrients is most lacking in the diets of the world's population?	263	63.1
Considering developing and developed countries, the projection of the world population for the year 2050 shows the largest segment will be in:	255	61.2
Generally, who carries out most of the field work on an African farm?	254	60.9
Which country is the largest producer of tea in the world?	251	60.2
Which following sequence correctly ranks, from most to least, the four languages most spoken worldwide?	205	49.2
Although large areas of land are brought into cultivation throughout the world each year, large amounts are also rendered useless or are reduced in productive capacity for each of the reasons below except:	181	43.4
According to World Bank, what percent of the world's population used the internet in 2010?	167	40.0
As of 2010, the percent of useable land in the world for food production is:	147	35.3
According to UNESCO, as of 2000, approximately what percent of the urban population did not have piped water in its house?	115	27.6
According to the FAO, about how many crop species provide 95% of human food energy needs?	99	23.7
In what part of the world are you most likely to find a hand-dug underground irrigation system called a ghanat (quanat) that may extend for many miles from the mountains to fields out to the plains?	72	17.3
According to the Intergovernmental Panel on Climate Change, as of 2007, which sector contributed the largest percentage of greenhouse gas emissions?	63	15.1
According to the FAO, which food sector uses a greater variety of biodiversity than any other?	53	12.7
In East Africa, it is expected that everyone will _____ upon greeting each other at a meeting, and upon departure from meetings.	47	11.3
As of 2012, how many countries are members of the European Union?	40	9.6
According to the Food and Agriculture Organization of the UN (FAO), as of 2008, what percent of the world's population was undernourished?	30	7.2

Attitudes

A 36 item Likert-type scale was used to measure the personal feelings or thoughts the teachers had about international agricultural issues. The largest number of agriculture teachers (367, 88.4%) agreed or strongly agreed with the statement "Youth/Students should know more about agriculture and its importance to the world economy." The fewest agriculture teachers (228, 55.2%) agreed or strongly agreed with the statement "Youth/Students should know more about the cultures of other countries." The scale average was 5.01, with a standard deviation of 0.58.This scale measured the attitudes of agriculture teachers towards international agricultural issues. The average of 5.01 +/- 0.58 falls within the "agree" range, indicating that most teachers have positive attitudes towards international agricultural issues. Table 4-3 shows the frequency of responses from 1 (strongly disagree) to 6 (strongly agree) for each attitude statement.

Table 4-3. Frequencies of responses to attitude statements for agriculture teachers

Statement	1	2	3	4	5	6
Youth/Students should know more about agriculture and its importance to the world economy	10	6	4	28	125	242
Youth/Students should know more about their state's agricultural industry and its connections to world trade	8	7	5	32	153	210
Youth/Students are more likely to understand global agriculture if instructed about major agricultural products produced in their home state	0	3	7	47	180	176
Youth/Students should know more about how world agriculture affects food prices in the local grocery store	9	5	7	39	153	202
Youth/Students should know more about how world events affect local agriculture in their community	10	5	6	39	167	188

Table 4-3. Continued

Statement	1	2	3	4	5	6
Youth/ Students should know more about agricultural products that their home state sells to other countries	10	5	5	44	158	193
Politics has a major effect on world agriculture.	2	3	8	50	164	187
Youth/Students are more likely to understand global agriculture if instructed about major agricultural products produced in their country	0	3	8	52	207	143
Marketing U. S. agricultural products to other countries will help the U. S. economy.	2	3	6	55	190	159
Youth/Students are more likely to understand global agriculture if instructed about countries that need U. S. agricultural products	1	2	6	59	199	146
Global food production affects food prices in my local grocery store.	2	3	8	62	191	147
If properly instructed, youth/students can understand international career opportunities in agriculture.	2	3	4	66	198	140
Considering U. S. agricultural exports, youth/students should be instructed on other countries' agricultural production practices	1	1	5	70	197	139
If properly instructed, youth/students can understand basic international agricultural concepts.	1	4	8	69	192	140
Lessons on global agricultural issues should prepare youth/students for future changes in global agriculture	1	3	6	73	220	112
Learning more about agriculture in other countries will help youth/students understand future changes in world agricultural production.	2	3	5	79	203	122
World events impact the agricultural industry in their community.	1	4	12	72	198	127
Lessons on global agricultural issues should help youth/students appreciate the interdependency of nations around the world	0	2	6	82	223	102
Marketing agricultural products to other countries will help their state's economy.	2	4	8	77	186	138
Youth/Students should know more about the agricultural products from other countries that are consumed in their state	9	6	10	69	169	152
Youth/Students are more likely to understand global agriculture if instructed about the economic issues between the U. S. and other countries	0	4	12	76	201	120

Table 4-3. Continued

Statement	1	2	3	4	5	6
Lessons on global agricultural issues should help youth/students function better as a citizen in a global society	1	3	5	88	203	114
Lessons on global agricultural issues should not be too complex for youth/students	0	9	15	77	177	137
Considering U. S. agricultural exports, youth/students should be instructed on other countries' natural resources	1	2	11	89	214	97
Lessons on global agricultural issues should help youth/students understand global agricultural marketing systems	1	2	6	100	213	93
Youth/Students should know more about other countries' markets for U. S. agricultural products	8	6	10	88	183	119
Youth/Students are more likely to understand global agriculture if instructed about the humanitarian issues between the U. S. and other countries	1	3	18	91	194	105
Youth/Students are more likely to understand global agriculture if instructed about the political issues between the U. S. and other countries	1	5	17	98	191	101
Youth/Students should know more about the differences between developed and developing countries	9	6	19	67	191	93
Considering U. S. agricultural exports, youth/students should be instructed on other countries' standard of living	2	3	12	128	185	84
Lessons on global agricultural issues should provide an opportunity for youth/students to interact with people in other parts of the world	1	6	16	127	168	97
American culture has a major effect on agriculture in other countries.	2	10	39	110	138	116
Considering U. S. agricultural exports, youth/students should be instructed on other countries' infrastructure (educational system, transportation system, major industries, etc.)	1	6	22	151	158	76
Considering U. S. agricultural exports, youth/students should be instructed on other countries' cultures	2	6	21	152	155	78
Youth/Students should know more about the cultures of other countries	11	7	35	134	153	75

Note. 1= strongly disagree, 2= disagree, 3= slightly disagree, 4= slightly agree, 5= agree, 6=strongly agree

Beliefs

In order to measure the personal opinions of the teachers regarding global agricultural issues, a 22 item Likert-type scale was used. The most agriculture teachers (380, 91.3%) agreed or strongly agreed with the statement “It is important for youth/students to learn about food safety.” The fewest number of teachers (140, 34.9%) agreed or strongly agreed with the statement “I learn about global agricultural issues from listening to selected radio programs.” The scale average was 4.68 with a standard deviation of 0.55. This scale measured the beliefs of agriculture teachers towards international agricultural issues. The average of 4.68 +/-0.55 falls within the “slightly agree” to “agree” range, indicating that most teachers have positive beliefs towards international agricultural issues. Table 4-4 shows the frequency of responses from 1 (strongly disagree) to 6 (strongly agree) for each belief statement.

Table 4-4. Frequencies of responses to belief statements for agriculture teachers

Statement	1	2	3	4	5	6
It is important for youth/students to learn about food safety	0	2	1	33	182	198
International agriculture involves more than farming	1	1	0	31	156	223
It is important for youth/students to learn about sustainable energy	2	4	4	48	203	155
It is important for youth/students to learn about global food security and hunger	0	2	5	54	195	160
Global food production allows me to eat a variety of products all year	1	3	6	48	177	177
Global agriculture is different from one country to another	2	5	10	49	185	161
Natural disasters affect the price of food in my local grocery store	0	4	5	59	166	178
Understanding other cultures helps U. S. producers market their products abroad	0	1	9	89	212	102
Understanding global politics helps U. S. producers market their products abroad	0	4	8	100	201	100
It is important for youth/students to learn about climate change	1	10	25	82	192	96
US agricultural products are superior in quality to products from other countries	2	8	28	103	159	113

Table 4-4. Continued

Statement	1	2	3	4	5	6
The US should actively help other countries develop their agricultural industries	1	3	19	120	168	101
It is important for youth/students to learn about childhood obesity	1	10	28	106	164	98
In times of famine, the U. S. should help other countries with food aid	2	4	23	130	167	87
Competition between producers worldwide keeps food prices low in my grocery store	2	13	44	127	146	81
I learn about global agricultural issues from watching selected television programs	1	26	27	126	182	44
I learn about global agricultural issues from professional development	2	28	43	109	147	66
I learn about global agricultural issues from my college classes	1	34	40	128	137	56
I learn about global agricultural issues from attending events such as fairs or shows	1	43	58	140	124	35
I learn about global agricultural issues from participating in study abroad programs	6	81	50	71	82	66
I learn about global agricultural issues from taking vacations in other countries	6	70	43	96	97	44
I learn about global agricultural issues from listening to selected radio programs	2	68	57	126	113	27

Note. 1= strongly disagree, 2= disagree, 3= slightly disagree, 4= slightly agree, 5= agree, 6=strongly agree

International Experiences

In order to investigate the impact of a variety of ten experiences, teachers were asked to indicate whether or not they had the experience listed. The most teachers (236, 56.6%) answered yes to “integrate global examples or case studies in classes you teach.” The fewest teachers (18, 4.3%) answered yes to “lived outside the US for a long duration for professional reasons (> 1 year).” Table 4-5 shows the frequency and percentage of “yes” responses from agriculture teachers to each experience.

Table 4-5. Frequencies and percentages of experiences from agriculture teachers

Statement	*f*	Percent
Integrate global examples or case studies in classes you teach	236	56.6
Traveled internationally for personal reasons (i.e. vacation, etc.)	198	47.5

Table 4-5. Continued

Statement	*f*	Percent
Participated in professional development workshop(s) with a global focus	174	41.7
Took a globally focused course as a student	136	32.6
Participated in a short term study abroad experience as a student (1 to 3 weeks)	67	16.1
Participated in a long term study abroad experience as a student (> 3 weeks)	35	8.4
Lived outside the US for a short duration for professional reasons (< 1 year)	33	7.9
Lived outside the US for a short duration for personal reasons	28	6.7
Lived outside the US for a long duration for personal reasons	21	5.0
Lived outside the US for a long duration for professional reasons (> 1 year)	18	4.3

4-H Agents

Demographics

Of the 324 4-H agents who completed the survey, 68 (21.0%) were male, 249 (75.9%) were female, and three (0.9%) did not respond. The respondents had an average of 13.1 years of experience, ranging from first year agents to 45 years of experience. Two hundred thirteen (65.7%) of the agents indicated that they did most of their work in a rural area, 62 (19.1%) indicated suburban, 39 (16.7%) indicated urban, and 10 (3.1%) did not respond. In terms of ancestry, 297 (91.1%) indicated that they were European/Caucasian, 11 (3.4%) that they were Native American, eight (2.5%) that they were African American, five (1.5%) that they were Mexican/Latin American, four (1.2%) that they were Asian, and one (0.3%) that they were Puerto Rican. Table 4-6 provides the frequency distribution of 4-H agent respondents' gender, years of experience, area in which they work, and family ancestry.

Table 4-6. Frequencies and percentages of demographic information for 4-H agents

	f	Percent
Gender (N= 317)		
Male	68	21.5
Female	249	78.5
Years of Experience (N=319)		
Less than 1 year	6	1.9
1-5	78	24.5
6-10	80	25.1
11-15	43	13.5
16-20	37	11.6
21-25	26	8.2
26-30	24	7.5
31-35	21	6.6
36+	4	1.3
Area in which participant works (N=314)		
Rural	213	67.8
Suburban	62	19.7
Urban	39	12.4
Family Ancestry (N=326)		
European/Caucasian	297	91.1
Native American	11	3.4
African American	8	2.5
Mexican/Latin American	5	1.5
Asian	4	1.2
Puerto Rican	1	0.3
Pacific Islander	0	0
Other Caribbean ancestry	0	0
Arab	0	0

Knowledge

Participants were asked to complete a 20 question multiple choice knowledge assessment on international agricultural issues in order to measure knowledge levels. The average percent correct for 4-H agents was 42%, or 8 questions of 20. Wingenbach et al. (2003) defined a passing score on the original assessment as 12 of 20 questions correct. Only 31 agents, or 9.6%, achieved a passing score. Table 4-7 presents the

frequencies and percentages of correct responses from 4-H agents on the knowledge assessment.

Table 4-7. Frequencies and percentages of correct answers for 4-H agents

Question	*f*	Percent
Which cereal grain is the basic food for more than half of the world's population?	275	84.9
The _____ desert is the world's largest hot desert.	149	76.9
What is the primary household fuel in Africa and Asia?	227	70.1
Which country is the largest producer of tea in the world?	211	65.1
Generally, who carries out most of the field work on an African farm?	199	61.4
Which one of the following food nutrients is most lacking in the diets of the world's population?	197	60.8
Considering developing and developed countries, the projection of the world population for the year 2050 shows the largest segment will be in:	191	59.0
Which following sequence correctly ranks, from most to least, the four languages most spoken worldwide?	170	52.5
What country produces the largest volume of swine?	168	51.9
Although large areas of land are brought into cultivation throughout the world each year, large amounts are also rendered useless or are reduced in productive capacity for each of the reasons below except:	136	42.0
According to World Bank, what percent of the world's population used the internet in 2010?	118	36.4
As of 2010, the percent of useable land in the world for food production is:	118	36.4
According to UNESCO, as of 2000, approximately what percent of the urban population did not have piped water in its house?	98	30.2
According to the FAO, about how many crop species provide 95% of human food energy needs?	95	29.3
In what part of the world are you most likely to find a hand-dug underground irrigation system called a ghanat (quanat) that may extend for many miles from the mountains to fields out to the plains?	60	18.5
According to the Intergovernmental Panel on Climate Change, as of 2007, which sector contributed the largest percentage of greenhouse gas emissions?	50	15.4
According to the FAO, which food sector uses a greater variety of biodiversity than any other?	48	14.8
As of 2012, how many countries are members of the European Union?	46	14.2

Table 4-7. Continued

Question	*f*	Percent
In East Africa, it is expected that everyone will _____ upon greeting each other at a meeting, and upon departure from meetings.	42	13.0
According to the Food and Agriculture Organization of the UN (FAO), as of 2008, what percent of the world's population was undernourished?	19	5.9

Attitudes

To measure the personal feelings or thoughts the 4-H agents had regarding international agricultural issues, a 36 item Likert-type scale was used. The highest number (296, 92.8%) of 4-H agents agreed or strongly agreed that "Youth/Students should know more about agriculture and its importance to the world economy." The lowest number (194, 61.0%) of 4-H agents agreed or strongly agreed with the statement "American culture has a major effect on agriculture in other countries." The scale average was 5.13 (*SD* = 0.54). This scale measured the attitudes of 4-H agents towards international agricultural issues. The average of 5.13 +/- 0.54 falls within the "agree" range, indicating that most agents have positive attitudes towards international agricultural issues. Table 4-8 shows the frequency of responses from 4-H agents on a scale of 1 (strongly disagree) to 6 (strongly agree) for each attitude statement.

Table 4-8. Frequencies of responses to attitude statements for 4-H agents

Statement	1	2	3	4	5	6
Youth/Students should know more about agriculture and its importance to the world economy	4	1	0	18	131	165
Youth/Students should know more about how world agriculture affects food prices in the local grocery store	3	2	2	25	133	153
Youth/Students should know more about how world events affect local agriculture in their community	3	1	4	23	139	147

Table 4-8. Continued

Statement	1	2	3	4	5	6
If properly instructed, youth/students can understand international career opportunities in agriculture.	1	1	4	31	165	117
Youth/Students should know more about agricultural products that their home state sells to other countries	3	1	5	28	152	129
Politics has a major effect on world agriculture.	2	2	4	30	120	160
Lessons on global agricultural issues should help youth/students appreciate the interdependency of nations around the world	0	0	4	34	166	114
Global food production affects food prices in my local grocery store.	1	1	3	34	155	124
Youth/Students are more likely to understand global agriculture if instructed about major export markets for U. S. agricultural products	1	0	6	35	173	103
Considering U. S. agricultural exports, youth/students should be instructed on other countries' agricultural production practices	1	1	5	35	173	103
Youth/Students should know more about their state's agricultural industry and its connections to world trade	3	1	2	37	140	135
If properly instructed, youth/students can understand basic international agricultural concepts.	1	2	4	39	162	112
Youth/Students should know more about the agricultural products from other countries that are consumed in their state	3	2	3	37	160	112
Lessons on global agricultural issues should prepare youth/students for future changes in global agriculture	0	1	6	39	168	104
Lessons on global agricultural issues should help youth/students function better as a citizen in a global society	1	1	3	45	145	123
Youth/Students are more likely to understand global agriculture if instructed about major agricultural products produced in their country	1	0	9	41	166	101
Youth/Students are more likely to understand global agriculture if instructed about major agricultural products produced in their home state	1	0	8	42	150	117
Youth/Students are more likely to understand global agriculture if instructed about countries that need U. S. agricultural products	1	1	5	44	162	105

Table 4-8. Continued

Statement	1	2	3	4	5	6
Youth/Students are more likely to understand global agriculture if instructed about the economic issues between the U. S. and other countries	1	1	5	48	148	115
Considering U. S. agricultural exports, youth/students should be instructed on other countries' natural resources	1	0	9	49	162	97
Learning more about agriculture in other countries will help youth/students understand future changes in world agricultural production.	2	0	4	55	155	103
World events impact the agricultural industry in their community.	1	1	8	52	148	108
Youth/Students are more likely to understand global agriculture if instructed about the humanitarian issues between the U. S. and other countries	1	0	9	55	152	101
Lessons on global agricultural issues should help youth/students understand global agricultural marketing systems	1	2	8	54	185	68
Youth/Students should know more about the cultures of other countries	2	0	8	56	124	128
Lessons on global agricultural issues should provide an opportunity for youth/students to interact with people in other parts of the world	0	0	10	57	145	106
Considering U. S. agricultural exports, youth/students should be instructed on other countries' standard of living	1	0	5	64	163	85
Considering U. S. agricultural exports, youth/students should be instructed on other countries' cultures	1	0	9	61	137	110
Marketing U. S. agricultural products to other countries will help the U. S. economy.	4	1	4	63	151	95
Lessons on global agricultural issues should not be too complex for youth/students	1	9	14	49	141	104
Youth/Students should know more about other countries' markets for U. S. agricultural products	3	2	5	66	151	91
Considering U. S. agricultural exports, youth/students should be instructed on other countries' infrastructure (educational system, transportation system, major industries, etc.)	1	2	8	70	159	78
Youth/Students are more likely to understand global agriculture if instructed about the political issues between the U. S. and other countries	1	1	11	69	140	96

Table 4-8. Continued

Statement	1	2	3	4	5	6
Youth/Students should know more about the differences between developed and developing countries	2	2	6	74	147	88
Marketing agricultural products to other countries will help their state's economy.	4	1	7	72	154	80
American culture has a major effect on agriculture in other countries.	1	3	24	96	131	63

Note. 1= strongly disagree, 2= disagree, 3= slightly disagree, 4= slightly agree, 5= agree, 6=strongly agree

Beliefs

A 22 item Likert-type scale was utilized to measure the personal opinions of the agents regarding global agricultural issues. The largest number of 4-H agents (307, 97.7%) agreed or strongly agreed with the statement "International agriculture involves more than farming." The fewest agents (94, 29.9%) agreed or strongly agreed with the statement "I learn about global agricultural issues from listening to selected radio programs." The scale average for 4-H agents was 4.74, with a standard deviation of 0.49. This scale measured the beliefs of 4-H agents towards international agricultural issues. The average of 4.74 +/- 0.49 falls within the "slightly agree" to "agree" range, indicating that most agents have positive attitudes towards international agricultural issues. Table 4-9 shows the frequency of responses from 1 (strongly disagree) to 6 (strongly agree) for each belief statement from 4-H agents.

Table 4-9. Frequencies of responses to belief statements for 4-H agents

Statement	1	2	3	4	5	6
International agriculture involves more than farming	0	0	0	7	115	192
It is important for youth/students to learn about food safety	0	0	1	13	125	176
Natural disasters affect the price of food in my local grocery store	0	2	3	17	127	165
It is important for youth/students to learn about global food security and hunger	0	0	3	25	137	151

Table 4-9. Continued

Statement	1	2	3	4	5	6
It is important for youth/students to learn about sustainable energy	1	2	1	25	136	151
It is important for youth/students to learn about childhood obesity	1	3	8	28	129	147
Global food production allows me to eat a variety of products all year	0	1	8	33	139	133
Global agriculture is different from one country to another	0	0	9	37	155	113
Understanding other cultures helps U. S. producers market their products abroad	0	1	6	58	165	83
Understanding global politics helps U. S. producers market their products abroad	0	0	8	63	171	72
It is important for youth/students to learn about climate change	4	2	18	51	124	117
In times of famine, the U. S. should help other countries with food aid	0	4	15	78	136	81
The US should actively help other countries develop their agricultural industries	1	0	14	88	127	83
I learn about global agricultural issues from professional development	5	11	21	90	127	59
US agricultural products are superior in quality to products from other countries	2	12	39	107	95	57
Competition between producers worldwide keeps food prices low in my grocery store	2	14	52	104	101	40
I learn about global agricultural issues from participating in study abroad programs	45	56	31	41	73	66
I learn about global agricultural issues from my college classes	22	33	25	88	103	35
I learn about global agricultural issues from taking vacations in other countries	36	49	30	70	81	44
I learn about global agricultural issues from watching selected television programs	13	34	28	120	97	22
I learn about global agricultural issues from attending events such as fairs or shows	19	45	48	102	78	21
I learn about global agricultural issues from listening to selected radio programs	22	50	42	106	69	25

International Experiences

4-H agents were asked to indicate yes or no in regards to whether or not they had had ten experiences. The largest number of agents (200, 61.7%) had experienced "traveled internationally for personal reasons (i.e. vacation, etc.)." The fewest agents

(14, 4.3%) answered yes to “lived outside the US for a long duration for personal reasons” and “lived outside the US for a short duration for personal reasons.” Table 4-10 shows the frequency and percentage of a “yes” response to each statement for the 4-H agent respondents.

Table 4-10. Frequencies and percentages of experiences from 4-H agents

Statement	*f*	Percent
Traveled internationally for personal reasons (i.e. vacation, etc.)	200	61.7
Participated in professional development workshop(s) with a global focus	173	53.4
Took a globally focused course as a student	118	36.4
Integrate global examples or case studies in classes you teach	116	35.8
Participated in a short term study abroad experience as a student (1 to 3 weeks)	56	17.3
Participated in a long term study abroad experience as a student (> 3 weeks)	40	12.3
Lived outside the US for a short duration for professional reasons (< 1 year)	34	10.5
Lived outside the US for a short duration for personal reasons	23	7.1
Lived outside the US for a long duration for professional reasons (> 1 year)	14	4.3
Lived outside the US for a long duration for personal reasons	14	4.3

Comparison

Demographics

When comparing Tables 4-1 and 4-6, it is clear that agriculture teachers and 4-H agents are similar in many ways. The agriculture teachers and 4-H agents surveyed had similar averages of years of experience, 14.5 and 13.1 years respectively. Both groups were also most likely to do the majority of their work in a rural area (79.3% of teachers, 67.8% of agents), followed by suburban areas (15.9% of teachers, 19.7% of agents) and urban areas (4.8% of teachers, 12.4% of agents). Both agriculture teachers and 4-H agents were most likely to be of European/Caucasian ancestry, 90.2% of teachers,

and 91.1% of agents were in this category. However, agriculture teachers were much more likely to be male than 4-H agents. Of the agriculture teachers surveyed, 57.5% were male, while only 21.5% of 4-H agents surveyed were male.

Objective 1: Perceptions of Agriculture Teachers and 4-H Agents towards International Agricultural Issues

A comparison of Tables 4-3, 4-4, 4-8 and 4-9 shows that both agriculture teachers and 4-H agents had generally positive perceptions of global agricultural issues as measured by their responses to statements on the attitude and belief scales. The attitude and belief scales both used a 1 (strongly disagree) to 6 (strongly agree).

The attitude scale average for teachers was 5.01 (*SD* = 0.58) and 5.13 (*SD* = 0.54) for agents. On the attitude scale, both agriculture teachers and 4-H agents most frequently agreed and strongly agreed with the statement “Youth/Students should know more about agriculture and its importance to the world economy.” Of agriculture teachers, 367 agreed or strongly agreed with that statement. Two hundred ninety-six 4-H agents agreed or strongly agreed with the statement “Youth/Students should know more about agriculture and its importance to the world economy.”

Agriculture teachers and 4-H agents differed on the attitude statement they least agreed or strongly agreed with. The fewest agriculture teachers agreed or strongly agreed with the statement “Youth/Students should know more about the cultures of other countries.” The fewest 4-H agents agreed or strongly agreed with the statement “American culture has a major effect on agriculture in other countries.” Statistically significant differences were found between agriculture teachers and 4-H agents on the attitude scale (t-value = -2.602, p-value = .009).

Tables 4-4 and 4-9 show the distribution of responses to belief statements for teachers and 4-H agents. The belief scale average for agriculture teachers was 4.68 (*SD* = 0.54) and 4.74 (*SD* = 0.49) for 4-H agents. On the belief scale, both agriculture teachers and 4-H agents least frequently agreed or strongly agreed with the statement "I learn about global agricultural issues from listening to selected radio programs" (140 teachers, 94 agents). This could be because radio programs are somewhat outdated technology for news. The top two belief statements were the same for both groups, but reversed. Agriculture teachers most frequently responded with a 5 or 6 to the statement "It is important for youth/students to learn about food safety" (380). This statement was the second most agreeable to 4-H agents, with 301 respondents selecting agree or strongly agree. Three hundred seven 4-H agents selected agree or strongly agree for the statement "International agriculture involves more than just farming." This statement was the second most frequently agreed or strongly agreed with for agriculture teachers, at 379. No statistically significant differences were found on the belief scale between teachers and agents (t-value = -1.729, p-value = .084).

Objective 2: Knowledge of Agriculture Teachers and 4-H Agents of International Agricultural Issues

Both agriculture teachers and 4-H agents had an average of 42%, or 8 questions of 20, correct on the knowledge assessment. Only 6.5% of agriculture teachers and 9.6% of agents achieved a passing score on the knowledge assessment. Teachers and agents were not found to be statistically different on the knowledge assessment (t-value = 0.36, p-value = .720). Both groups had higher percentages of correct answers on questions that could be considered general knowledge, or questions that have answers that are more widely reported on in the news, such as "Which cereal grain is the basic

food for more than half of the world's population?" and "Considering developing and developed countries, the projection of world population for the year 2050 shows the largest segment will be in:." Both groups had low percentages of correct answers on questions that contain information that may be misrepresented in the media, such as "According to the Intergovernmental Panel on Climate Change, as of 2007, which sector contributed the largest percentage of greenhouse gas emissions?" Both groups also had low scores on questions about cultural customs such as "In East Africa, it is expected that everyone will _____ upon greeting each other at a meeting, and upon departure from meetings." They also tended to underestimate the percent of underserved households on questions such as "According to the Food and Agriculture Organization of the UN (FAO), as of 2008, what percent of the world's population was undernourished?"

Table 4-11. Percentages of correct answers on knowledge assessment for teachers, agents, and overall

Question	Percent Agriculture Teachers	Percent 4-H Agents	Percent Overall
Which cereal grain is the basic food for more than half of the world's population?	78.7	84.9	81.2
What is the primary household fuel in Africa and Asia?	79.4	70.1	75.1
The _____ desert is the world's largest hot desert.	73.9	76.9	75.0
What country produces the largest volume of swine?	75.1	51.9	64.7
Which country is the largest producer of tea in the world?	60.2	65.1	62.2
Which one of the following food nutrients is most lacking in the diets of the world's population?	63.1	60.8	61.9
Generally, who carries out most of the field work on an African farm?	60.9	61.4	61.0
Considering developing and developed countries, the projection of the world population for the year 2050 shows the largest segment will be in:	61.2	59.0	60.0

Table 4-11. Continued

Question	Percent Agriculture Teachers	Percent 4-H Agents	Percent Overall
Which following sequence correctly ranks, from most to least, the four languages most spoken worldwide?	49.2	52.5	50.5
Although large areas of land are brought into cultivation throughout the world each year, large amounts are also rendered useless or are reduced in productive capacity for each of the reasons below except:	43.4	42.0	42.7
According to World Bank, what percent of the world's population used the internet in 2010?	40.0	36.4	38.4
As of 2010, the percent of useable land in the world for food production is:	35.3	36.4	35.7
According to UNESCO, as of 2000, approximately what percent of the urban population did not have piped water in its house?	27.6	30.2	28.7
According to the FAO, about how many crop species provide 95% of human food energy needs?	23.7	29.3	26.1
In what part of the world are you most likely to find a hand-dug underground irrigation system called a ghanat (quanat) that may extend for many miles from the mountains to fields out to the plains?	17.3	18.5	17.8
According to the Intergovernmental Panel on Climate Change, as of 2007, which sector contributed the largest percentage of greenhouse gas emissions?	15.1	15.4	15.2
According to the FAO, which food sector uses a greater variety of biodiversity than any other?	12.7	14.8	13.6
In East Africa, it is expected that everyone will _____ upon greeting each other at a meeting, and upon departure from meetings.	11.3	13.0	12.0
As of 2012, how many countries are members of the European Union?	9.6	14.2	11.6
According to the Food and Agriculture Organization of the UN (FAO), as of 2008, what percent of the world's population was undernourished?	7.2	5.9	6.6

Objective 3: International Experiences of Agriculture Teachers and 4-H Agents

When asked to respond yes or no as to whether or not they had a list of selected experiences, agents were more likely overall to have international experiences. Tables 4-5 and 4-10 show the frequencies and percentages of “yes” responses for teacher and agents respectively. Teachers responded “yes” most often (236, 56.6%) to the experience “integrate global examples or case studies in classes you teach.” Agents were most likely (200, 61.7%) to have “traveled internationally for personal reasons (i.e. vacation, etc.).” Teachers were least likely (18, 4.3%) to have “lived outside the US for a long duration for professional reasons.” The least common experiences for agents were “lived outside the US for a long duration for professional reasons (>1 year)” (14, 4.3%), and “lived outside the US for a long duration for professional reasons” (14, 4.3%).

Statistically significant differences were found between teachers and agents concerning three experiences. 4-H agents were significantly more likely to have answered yes to the experience “participated in professional development workshop(s) with a global focus” (p-value = 0.001). Agriculture teachers were significantly more likely to answer yes to “integrate global examples or case studies in classes you teach” (p-value = 0.000). Finally, 4-H extension agents were significantly more likely to have answered yes to “traveled internationally for personal reasons (i.e. vacation, etc.)” (p-value = 0.000).

Table 4-12. Chi-square statistics for experiences teachers and agents have had

Experience	Teachers		Agents		Pearson Chi-Square	Significance
	Yes	No	Yes	No		
E1: Participated in a short term study abroad experience as a student (1 to 3 weeks)	67	348	56	258	0.364	0.55

Table 4-12. Continued

Experience	Teachers		Agents		Pearson Chi-Square	Significance
	Yes	No	Yes	No		
E2: Participated in a long term study abroad experience as a student (> 3 weeks)	35	380	40	274	3.590	0.06
E3: Took a globally focused course as a student	136	279	118	196	1.821	0.18
E4: Lived outside the US for a short duration for professional reasons (< 1 year)	33	381	34	281	1.708	0.19
E5: Lived outside the US for a long duration for professional reasons (> 1 year)	18	397	14	300	0.006	0.94
E6: Participated in professional development workshop(s) with a global focus	174	241	173	143	11.822	0.00
E7: Integrate global examples or case studies in classes you teach	236	179	116	199	28.809	0.00
E8: Lived outside the US for a short duration for personal reasons	28	387	23	291	0.092	0.76
E9: Lived outside the US for a long duration for personal reasons	21	392	14	300	0.153	0.70
E10: Traveled internationally for personal reasons (i.e. vacation, etc.)	198	217	200	116	17.558	0.00

Objective 4: Relationship between Teachers and Agents Perceptions and Selected Demographics

Correlations between attitudes and beliefs and selected demographic variables were used to determine if significant relationships existed. No significant relationships existed between gender and attitudes or gender and beliefs. There were no significant

relationships between years of experience as a teacher or agent and beliefs. Similarly, there was no significant relationship between area in which the participant conducts most of his/her work and attitudes or beliefs. The Point Biserial correlation of years of experience and attitudes was negligible at only -0.08 (p-value = 0.03), making it not practically significant. These results are shown in Table 4-13 and Table 4-14.

Table 4-13. Correlations between perceptions and demographic variables

		Attitudes	Beliefs
Gender	Point Biserial Correlation	0.04	0.01
	Significance	0.33	0.88
	N	736	733
Years Experience	Pearson's Correlation	-0.08	-0.03
	Significance	0.03	0.46
	N	732	730

Table 4-14. ANOVA between work area and attitudes and beliefs

		Sum of Squares	df	Mean Square	F	Significance
Attitude Average	Between groups	0.135	2	0.068	.221	0.80
	Within Groups	221.939	726	0.306		
	Total	22.075	728			
Belief Average	Between groups	0.864	2	0.432	1.582	0.21
	Within Groups	197.128	722	0.273		
	Total	197.992	724			

Objective 5: Difference Between International Experiences and Educator Knowledge

Table 4-15 shows the T-tests used to investigate differences between international experiences of educators and knowledge. Five experiences did not have a statistically significant difference with respect knowledge: (E1) participated in a short term study abroad experience as a student (1 to 3 weeks), (E5) lived outside the US for a long duration for professional reasons (> 1 year), (E6) participated in professional development workshop(s) with a global focus, (E8) lived outside the US for a short

duration for personal reasons, and (E9) lived outside the US for a long duration for personal reasons.

Five of the experiences had a statistically significant difference at the 0.05 level with knowledge: (E2) participated in a long term study abroad experience as a student (> 3 weeks), (E3) took a globally focused course as a student, (E4) lived outside the US for a short duration for professional reasons (< 1 year), (E7) integrate global examples or case studies in classes you teach, and (E10) traveled internationally for personal reasons (i.e. vacation, etc.).

Table 4-15. Differences between international experiences and knowledge

Experience	t	Significance
E1: Participated in a short term study abroad experience as a student (1 to 3 weeks)	1.642	0.101
E2: Participated in a long term study abroad experience as a student (> 3 weeks)	2.048	0.04
E3: Took a globally focused course as a student	2.991	0.00
E4: Lived outside the US for a short duration for professional reasons (< 1 year)	2.578	0.01
E5: Lived outside the US for a long duration for professional reasons (> 1 year)	1.756	0.08
E6: Participated in professional development workshop(s) with a global focus	.621	0.54
E7: Integrate global examples or case studies in classes you teach	4.312	0.00
E8: Lived outside the US for a short duration for personal reasons	-.242	0.81
E9: Lived outside the US for a long duration for personal reasons	1.268	0.21

Table 4-15. Continued

Experience	t	Significance
E10: Traveled internationally for personal reasons (i.e. vacation, etc.)	3.543	0.00

Objective 6: Difference between International Experiences and Educator Perceptions

To investigate the difference between international experiences and educator perceptions, independent samples t-test was used. At the 0.05 significance level, two experience variables had no differences with *attitudes* or *beliefs*: (E1) participated in a short term study abroad experience as a student (1 to 3 weeks) and (E2) participated in a long term study abroad experience as a student (> 3 weeks). Table 4-16 shows the differences between the international experiences and attitudes and beliefs.

Attitudes

In addition to E1 and E2, two other experiences did not have a statistically significant difference with attitudes. (E4) Lived outside the US for a short duration for professional reasons (< 1 year), and (E5) lived outside the US for a long duration for professional reasons (> 1 year), had no statistically significant differences with attitudes.

Six experience statements had significant differences with attitudes at the 0.05 significance level: (E3) took a globally focused course as a student (p-value = 0.002), (E6) participated in professional development workshop(s) with a global focus (p-value = 0.001), (E7) integrate global examples or case studies in classes you teach (p-value = 0.003), (E8) lived outside the US for a short duration for personal reasons (p-value = 0.010), (E9) lived outside the US for a long duration for personal reasons (p-value = 0.022), and (E10) traveled internationally for personal reasons (i.e. vacation, etc.) (p-value = 0.044).

Beliefs

Statistically significant differences were found between eight experience statements and beliefs. Several of the statements, such as (E3) took a globally focused course as a student (p-value = 0.000), (E6) participated in professional development workshop(s) with a global focus (p-value = 0.000), and (E7) integrate global examples or case studies in classes you teach (p-value = 0.000), may indicate the importance of quality introductory and on-going global experiences for teachers and agents.

The other 5 statements: (E4) lived outside the US for a short duration for professional reasons (< 1 year) (p-value = 0.001), (E5) lived outside the US for a long duration for professional reasons (> 1 year) (p-value = 0.009), (E8) lived outside the US for a short duration for personal reasons (p-value = 0.012), (E9) lived outside the US for a long duration for personal reasons (p-value = 0.006), and (E10) traveled internationally for personal reasons (i.e. vacation, etc.) (p-value = 0.015), indicate the influence that international travel can have. Participants who had lived abroad or traveled to another country had more positive beliefs than those who had not.

Table 4-16. Differences between international experiences and perceptions

Experience	Attitudes		Beliefs	
	t	Significance	t	Significance
E1: Participated in a short term study abroad experience as a student (1 to 3 weeks)	.151	.88	.954	.34
E2: Participated in a long term study abroad experience as a student (> 3 weeks)	-.384	.70	1.233	.22
E3: Took a globally focused course as a student	3.086	.00	3.754	.00

Table 4-16. Continued

Experience	Attitudes		Beliefs	
	t	Significance	t	Significance
E5: Lived outside the US for a long duration for professional reasons (> 1 year)	1.683	.09	2.602	.01
E6: Participated in professional development workshop(s) with a global focus	3.408	.00	3.840	.00
E7: Integrate global examples or case studies in classes you teach	2.977	.00	3.556	.00
E8: Lived outside the US for a short duration for personal reasons	2.579	.01	2.528	.01
E9: Lived outside the US for a long duration for personal reasons	2.300	.02	2.740	.01
E10: Traveled internationally for personal reasons (i.e. vacation, etc.)	2.013	.04	2.439	.02

Summary

Chapter 4 presented the findings of this study. The findings were structured based on the respondent type and the objectives of the study. The descriptive statistics presented included, for both agriculture teachers and 4-H agents: gender, years of experience as a teacher or agent, area in which the participant does most of their work, and family ancestry. The objectives discussed included: (1) Perceptions of agriculture teachers and 4-H agents towards international agricultural issues; (2) Knowledge of agriculture teachers and 4-H agents of international agriculture issues; (3) International experiences of agriculture teachers and 4-H agents; (4) Relationship between teachers and agents perceptions and selected demographics; (5) Difference between

international experiences and educator knowledge; (6)Difference between international experiences and educator perceptions.

The findings presented in Chapter 4 will be discussed in greater detail in Chapter 5. Chapter 5 will also offer a summary of findings, discussions and implications, and recommendations regarding these findings.

CHAPTER 5
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to assess the international experiences, knowledge, attitudes, and beliefs of secondary agriculture teachers and 4-H extension agents regarding global agricultural issues. The following objectives guided this study:

To determine the:

- Perceptions of agriculture teachers and 4-H agents towards international agricultural issues;
- Knowledge of agriculture teachers and 4-H agents of international agriculture issues;
- International experiences of agriculture teachers and 4-H agents;
- Relationship between teachers and agents perceptions and selected demographics;
- Difference between international experiences and educator knowledge;
- Difference between international experiences and educator perceptions

Summary of Findings

The findings were based on the respondent type and the objectives of the study. In order to conduct this study, 2000 agriculture teachers were contacted through email using a simple random sample of the National FFA Organization's Agricultural Career Network database directory. This National FFA Organization recorded over 11,000 agriculture teachers in November 2011. Additionally, 1,000 4-H agents were contacted by email using a simple random sample from the NAE4-HA. The required sample size was determined using a desired precision of five percent, a 95% confidence level, and a variability of 50% (Israel, 1992). Using Israel's (1992) recommendations, the desired sample size was determined to be 385 agriculture teachers, and 333 4-H extension agents (Israel, 1992). An extra 80% of agriculture teachers were sampled, due to

hypothesized response rates of 25% (Shoulders, 2012; Harris & Birkenholz, 1996; Ibezim & McCracken, 1994). An additional 64% of 4-H agents were sampled, due to a hypothesized response rate of 66% (Reaman, 1990; Bowen, Radhakrishna, & Keyser, 1994).

Of the 2,000 agriculture teachers, the valid sample size was 1756 after invalid email addresses and those no longer in the profession were removed. Four hundred twenty four agriculture teachers completed the survey, resulting in a response rate of 24.1%. Of the 1,000 4-H agents, 927 were eligible to take the survey and had a valid email address. Of those 927, 332 completed the survey, resulting in a response rate of 35.9%. These response rates may have been increased if the participants knew the sender of the survey invitation.

Initially, non-respondents were contacted by email. When individual emails did not yield enough responses, non-respondents were contacted by phone. Again, this did not yield enough responses. In order to address non-response, early and late respondents were compared. Late respondents were classified as though who responded to the survey after the November 5th follow up email. No significant differences were found between early and late respondents.

The variables analyzed in this study were selected using Ajzen's (1991) Theory of Planned Behavior. Attitude towards the behavior, subjective norms, and perceived behavioral control all affect a person's intention to perform a behavior, which affects whether or not they actually perform the behavior (Ajzen, 1991). Attitude towards the behavior is described as a person's personal feelings about the behavior (Ajzen, 1991). Subjective norms are described as how a person believes others will perceive them if

they perform or do not perform the behavior (Ajzen, 1991). Perceived behavioral control is the level of control a person believes they have over performing the behavior (Ajzen, 1991). For this study, only variables that fell into the category of attitude towards the behavior were analyzed. These variables included demographics, knowledge, beliefs, attitudes, and international experiences (See Figure 2-1).

Demographic Variables

Respondents were analyzed by the following demographics: gender, years of experience as a teacher or 4-H agent, area in which they do most of their work, and family ancestry. Results can be found in Tables 4-1 and 4-6. Table 4-1 provides the frequency distribution of agriculture teacher respondents' gender, years of experience, area in which they work, and family ancestry. Table 4-6 provides the frequency distribution of 4-H agent respondents' gender, years of experience, area in which they work, and family ancestry.

Teachers and agents who responded had similar averages of years of experience, at 14.5 and 13.1 years respectively. Both groups were also most likely to do most of their work in a rural area, with 79.3% of teachers and 67.8% of agents selecting rural. Agriculture teacher and 4-H agents who responded to this survey were overwhelmingly of European/Caucasian ancestry, at 90.2% for teachers, and 91.1% for agents. Though similar in these ways, agriculture teachers were much more likely to be male (57.5%) than 4-H agents (21.5%). This is not unusual, as agriculture extension agents are often male, while 4-H extension agents are often female.

Objective 1: Perceptions of Agriculture Teachers and 4-H Agents towards International Agricultural Issues

A 36 item six-point Likert-type scale was used to assess the personal feelings or thoughts of agriculture teachers and 4-H agents regarding statements about international agricultural issues. On a scale of 1 (strongly disagree) to 6 (strongly agree), teachers averaged 5.01 (*SD* = 0.58), while agents averaged 5.13 (*SD* = 0.54). Both teachers and agents generally had positive personal feelings or thoughts about the items on the attitude scale. Agriculture teachers and agents both agreed or strongly agreed most frequently with the statement "Youth/Students should know more about agriculture and its importance to the world economy." Of agriculture teachers, 367 agreed or strongly agreed with that statement, along with 296 4-H agents. The fewest agriculture teachers agreed or strongly agreed with the statement "Youth/Students should know more about the cultures of other countries." The fewest 4-H agents agreed or strongly agreed with the statement "American culture has a major effect on agriculture in other countries." No statistically significant differences were found between agriculture teachers and 4-H agents on the attitude scale.

A 22 item six-point Likert-type scale was utilized to measure the personal opinions of agriculture teachers and 4-H agents regarding global agricultural issues. On a scale of 1 (strongly disagree) to 6 (strongly agree), teachers averaged 4.68 (*SD* = 0.54), while agents averaged 4.74 (*SD* = 0.49). Both agriculture teachers and 4-H agents least frequently agreed or disagreed with the statement "I learn about global agricultural issues from listening to selected radio programs" (140 teachers, 94 agents). Agents (307) most frequently agreed or strongly agreed with the statement "International agriculture involves more than just farming." This was the second most

agreeable statement to agriculture teachers, with 379 teachers selecting a 5 or 6. The statement agriculture teachers found most agreeable, with 380 teachers selecting a 5 or 6, was “It is important for youth/students to learn about food safety.” This statement was the second most agreeable to 4-H agents, with 301 respondents selecting agree or strongly agree. No statistically significant differences were found on the belief scale between teachers and agents.

Objective 2: Knowledge of Agriculture Teachers and 4-H Agents of International Agricultural Issues

A 20 item multiple choice test based on items from the FAO and the) International Agricultural Awareness and Understanding Survey by Wingenbach et al. (2003) was used to assess participant knowledge. Both agriculture teachers and 4-H agents had an average of 42% correct. Only 27 (6.5%) agriculture teachers and 31 (9.6%) agents achieved a passing score of 12 questions correct of 20, as defined by Wingenbach et al. No significant differences were found between agriculture teachers and 4-H agents on the knowledge assessment.

Objective 3: International Experiences of Agriculture Teachers and 4-H Agents

Participants were asked to indicate “yes” or “no” whether they had had ten international experiences. The largest number of teachers, 236 (56.6%) indicated that they had had the experience “integrate global examples or case studies in classes you teach.” The largest number of agents, 200 (61.7%), had experienced “traveled internationally for personal reasons (i.e. vacation, etc.).” The fewest number of teachers, 18 (4.3%) indicated that they had “lived outside the US for a long duration for professional reasons (> 1 year).” The fewest agents, 14 (4.3%), answered yes to “lived outside the US for a long duration for personal reasons” and “lived outside the US for a

short duration for personal reasons." Overall, agents were more likely to have had international experiences.

Statistically significant differences were found regarding three of the experiences. Teachers were significantly more likely to answer yes to the statement "integrate global examples or case studies in classes you teach." This could be due to the use the use of the words "classes" and "teach," as many 4-H agents may not consider the work they do as teaching or their meeting as classes. Agents were significantly more likely to have "participated in workshop(s) with a global focus" and "traveled internationally for personal reasons (i.e. vacation, etc.)." Agents may have more opportunities to attend globally-focused workshops and travel abroad than agriculture teachers.

Objective 4: Relationship between Teachers and Agents Perceptions and Selected Demographics

Correlations between attitudes and beliefs and selected demographics were investigated to determine if any significant relationships existed. No significant relationships were found between gender and attitudes, gender and beliefs, years of experience as a teacher or agent and beliefs, area in which the participant conducts most of their work and attitudes, and work area and beliefs. Years of experience and attitudes had a significance level of 0.029, but the Point Biserial correlation of -0.081 was negligible.

Objective 5: Difference between International Experiences and Educator Knowledge

In order to investigate the potential differences in knowledge based on international experiences, independent-samples t-tests were used. Five experiences did not have a significant difference with knowledge at the 0.05 level. The five experiences that had a significant difference with knowledge fell into two main

categories. Two of the experiences were related to prior or on-going learning by the educator, while the other three were related to international travel or living. These experiences may have a longer-lasting or stronger impact than other experiences.

Objective 6: Difference between International Experiences and Educator Perceptions

Independent-samples t-tests were used to investigate the differences in perceptions based on international experiences. At the 0.05 significance level, two experience variables showed no difference with attitudes or beliefs. Two additional experiences did not differ statistically. Of the six experience statements that had differences significant at the 0.05 level, three could be categorized as teacher or agent education, while the other three fell into the international travel or living category. The educational experiences may help teachers and agents remain in touch with international issues. The travel and living experiences may be significant because they allow the participants to witness global issues firsthand.

Eight experience statements had significant differences with beliefs at the 0.05 level. Four of those statements related to introductory or on-going education, indicating the importance of education in cultivating positive beliefs. The other four statements were related to international travel or living, indicating that firsthand international experiences can affect beliefs. Experiences such as E3, E6, and E7 may affect attitudes because they expose teachers and agents to international issues, either on an introductory on on-going basis. Travel and living experiences such as E8, E9, and E10 may affect attitudes because the participant is strongly affected by actually experiencing and witnessing international issues in person.

Discussion and Implications

Objective 1: Perceptions of Agriculture Teachers and 4-H Agents towards International Agricultural Issues

This study found that both agriculture teachers and 4-H agents have overall positive perceptions of international agricultural issues. This finding is consistent with several prior studies. Akpan and Martin (1996) found that agricultural education professors nationwide believed that international agricultural issues would become more important in the next 10 to 20 years and that "the total college curriculum should reflect a respect for knowledge of the global community" (p. 66). This could correlate closely with the top–rated belief statement by both teachers and agents: "Youth/Students should know more about agriculture and its importance to the world economy." Faculty at Iowa State University in the College of Agriculture also believed that internationalization was important (King & Martin, 1995). The findings of this study are also consistent with the results of the study by Hossain et al. (1995) showing that Michigan agricscience teachers had positive attitudes towards internationalization of the curriculum. This study also supports Ingram's (1999) results from Pennsylvania Extension educators that found that respondents agreed that learning about other cultures should be an important part of 4-H and Ingram's conclusion that extension professionals viewed learning about other cultures as a way for youth to grow and develop.

These results could indicate that teachers and agents would be receptive to increasing the integration of international agriculture concepts. Cronin-Jones (1991) found that teacher beliefs and attitudes played a large role regarding curriculum implementation and strategy choice when teaching a curriculum. Ibezim and McCracken

(1994) also found that teacher attitudes had a positive relationship with integration of internationalized agriculture curricula. Reaman's (1990) findings that positive perceptions of international agricultural issues and involvement in 4-H international programs are related indicate that this trend holds true in non-formal education as well.

Objective 2: Knowledge of Agriculture Teachers and 4-H Agents of International Agricultural Issues

This study found that both teachers and agents did poorly on an assessment meant to assess knowledge of international agricultural issues. This is consistent with many previous studies on students at the secondary and post-secondary levels. Moore et al. (1996) found that students at Michigan State University had significant gaps in their knowledge of international agriculture. Further, Wingenbach et al. (2003) found that Texas A&M University juniors and seniors scored extremely poorly on an older version of the same knowledge test used in this study. Secondary students at the Pennsylvania Governor's School of Agricultural Sciences also scored poorly on tests about people and culture knowledge and agricultural products and policies knowledge (Radhakrishna et al., 2003). Studies by Mason et al. (1994) and Mamontova and Bruening (2005) also evidenced the serious lack of international agricultural knowledge in undergraduate agricultural students.

In this study, the results suggest that the low knowledge scores of secondary and undergraduate students are carried into professions such as agriculture teacher and 4-H agent. This may suggest that agriculture teachers and 4-H agents are not receiving adequate in-service professional development and training regarding international agricultural issues. Increasing educator knowledge of global agricultural issues may

encourage teachers and agents to use global issues in their work more often (Ibezim & McCracken, 1994; Navarro, 2005).

Both groups had higher percentages of correct answers on questions that could be considered general knowledge, or questions that have answers that are more widely reported on in the news, such as “Which cereal grain is the basic food for more than half of the world’s population?” and “Considering developing and developed countries, the projection of world population for the year 2050 shows the largest segment will be in:.” Not all agriculture teachers and 4-H agents were in agriculture programs in secondary or postsecondary school, but access to the media and postsecondary education may have provided respondents with the knowledge to accurately answer these types of questions.

Both groups had low percentages of correct answers on questions that contain information that may be misrepresented in the media, such as “According to the Intergovernmental Panel on Climate Change, as of 2007, which sector contributed the largest percentage of greenhouse gas emissions?” It is possible that access to inaccurate media may skew participants’ perspectives. Both groups also had low scores on questions about cultural customs such as “In East Africa, it is expected that everyone will _____ upon greeting each other at a meeting, and upon departure from meetings.” Low scores on cultural customs may be due to lack of specific knowledge. It is possible that more general questions about cultural customs may have elicited more correct answers. Teachers and agents also tended to underestimate the percent of underserved households on questions such as “According to the Food and Agriculture

Organization of the UN (FAO), as of 2008, what percent of the world's population was undernourished?" This may be due to inexperience with these issues on a global scale.

Objective 3: International Experiences of Agriculture Teachers and 4-H Agents

This study found that a relatively small number of teachers and agents had international experiences. The most common experience for teachers was "integrate global examples or case studies in classes you teach," while the least common was "lived outside the US for a long duration for professional reasons (> 1 year)." Agents may not have responded "yes" to the statement regarding integration because they do not consider their work as teaching classes. The most common experience for agents was experienced "traveled internationally for personal reasons (i.e. vacation, etc.)," while the least common were "lived outside the US for a long duration for personal reasons" and "lived outside the US for a short duration for personal reasons."

Teachers were significantly more likely to integrate global example and case studies into classes, though the low number of agents may be due to wording. Agents were significantly more likely to have participated in workshops with a global focus and to have traveled internationally for personal reasons. This may be due to the availability of workshops, or a higher desire to attend them in agents.

This is consistent with the statistics from the Institute of International Education that show only 1.3% of agriculture students study abroad (2011). Though not all agriculture teachers and 4-H agents were agriculture students, this may explain some of the low participation rates. Sammons and Martin (1997) also found that a low amount of Iowa State University agricultural major undergraduates had participated in international experiences other than foreign language classes. Mamontova and Bruening (2005) found that Penn State undergraduates were least interested in participating in study

abroad when given a list of international experiences, and that despite the value, many students had not participated in international activities. These results are also consistent with findings by Wingenbach et al. (2003) that the fewest number of agricultural undergraduate students had participated in IFYE or work experience.

The results of this study indicate that the quality of international experiences may be more important than the quantity. Though teachers and agents both had moderate amounts of international experiences, there is no way to measure the quality of the experiences participants had. Teachers and agents may feel that their time is not well spent on the types of international experiences currently available to them. Teachers and agents may also have a hard time finding time to take off in order to attend conferences or participate in other activities. Additionally, many schools and county extension offices may discourage works from taking time off, especially for international experiences, which may be seen as less valuable. Local politics in schools and extension offices may mean that time taken off for international experiences is not seen as valuable.

Neither profession is particularly well-paid, presenting another barrier to participation in international activities. Another barrier to participation is family, since many agents and teachers may be unable to take family with them during experiences, or unable to leave their family for a period of time. Teachers and agents are also unlikely to work a traditional nine to five workday, making taking time off more taxing on work and family schedules. Providing high-quality, purposeful international experiences with evident, real-world application may draw more attendants to professional

development experiences. These experiences could be provided by universities, extension offices, or independent workshop suppliers.

Objective 4: Relationship between Teachers and Agents Perceptions and Selected Demographics

This study found no significant relationships between gender and beliefs, years of experience as a teacher or agent and beliefs, years of experience and attitudes, area in which the participant conducts most of their work and attitudes, and work area and beliefs. This is inconsistent with prior studies. Ibezim and McCracken (1994) found positive relationships between years teaching and level of integration. Hossain et al. (1995), had results that conflicted with those of Ibezim and McCracken (1994), when they found that younger teachers had more favorable attitudes towards internationalization than older teachers (1995). In a review of the literature, Schuerholz-Lehr (2007) found that many, but not all, studies indicated that females were more world-minded than males. Zhai and Scheer (2004) also found that female students had a more positive global perspective and attitude than males.

The results of this study suggest that gender, years of experience, and work area do not have a significant effect on the attitudes and beliefs. Gender may not have had a significant relationship with perceptions because not all prior studies showed a link. The lack of relationship between years of experience and perceptions and work area and perceptions may be due to consistencies in training and educational background across the professions. The lack of relationships may be beneficial to professional development designers, as this may indicate that a single professional development can be applied to teacher and agents across gender, years of experience, and work area.

Objective 5: Difference between International Experiences and Educator Knowledge

The results of this study found that no significant differences existed between any of the ten international experiences and knowledge scores. This is inconsistent with the study by Radhakrishna et al. (2003) of secondary students indicated that those who participated in IFYE had higher knowledge scores than those who had not (2003). Though IFYE was not one of the experiences listed, agents and teachers were given to option to indicate that they had studied abroad for a short or long period of time. It is also inconsistent with the findings of Boyd et al. (2003) that IFYE participation increased global awareness of participants. Bruening and Frick (2004) found that participants in an internationally-focused class with a travel component felt they better understood culture.

The results of this study suggest that *quality* of international experience may matter more than *quantity*. However, respondents were not asked to indicate when they participated in the international experience. The respondents have been working for an average of about 15 years, meaning they may have participated in international experiences during postsecondary education. International 4-H Youth Exchange (IFYE) could be an example of a high-quality experience due to the care taken to ensure that participants have a positive educational experience. Participants are placed with multiple carefully chosen host families for about 1 month each, for a total of three to six month, and expected to participate in the family's culture and day-to-day activities (IFYE Association of the USA, Inc., 2012). Participants are also provided with information on preparing for the trip and on creating presentations about the experience. High-quality international experiences may provide more significant effects than do lower-quality, or less purposeful, experiences.

Objective 6: Difference between International Experiences and Educator Perceptions

This study found that international experiences as a whole did not practically affect attitudes or beliefs. Only one experience, “took a globally focused course as a student,” had a weak difference with beliefs. This is inconsistent with prior research. In a review of the literature, Schuerholz-Lehr (2007) described a strong positive relationship between international travel and intercultural perspectives. Sammons and Martin (1997) found that participation in international activities had a significant, positive effect on Iowa State University undergraduate perceptions. Bruening and Frick (2004) also found positive results from the use of an internationally focused undergraduate course with a travel component on student perceptions. The results of this study are also inconsistent with the results of Cusher and Mahon’s (2002) study of student teachers. After an 8 to 15 week overseas student teaching experience, the participants reported an increase in positive perceptions, such as trust and openness to diversity (Cusher & Mahon, 2002). The results of this study also conflicted with the findings of King and Martin (1995) that international travel by faculty was positively linked to support of curriculum internationalization. This study’s findings are also inconsistent with findings by Akpan and Martin (1996) that international travel by agricultural education professors was positively related to higher perceptions. Reaman (1990) also found that international travel by 4-H professional in Pennsylvania was positively related to attitudes towards 4-H international programs. Though agents and teachers were not asked about their attitude towards 4-H international programs, Reaman’s (1990) study supported previous findings that international travel and perceptions were positively related.

In this study, the results suggested that international experiences were not significantly different with perceptions of international agricultural issues. This may speak to the importance of the use of more purposeful international experiences. It is possible that the international experiences the agents and teachers had were not well-focused and purposeful, leading to a lack of difference with perceptions. However, the importance of the passage of time cannot be measured in this study. Respondents were not asked to indicate when they participated in international experiences, meaning that the effect of time cannot be evaluated. It is likely that the passage of time diminished any positive outcomes from international experiences teachers and agents had.

Recommendations

This study addressed the issue of global agricultural issues in formal and nonformal agricultural education programs on a national scale. Few studies have compared formal and nonformal agricultural education regarding global agricultural issues, and even fewer have done it on a multi-state basis. More research must be done to determine if the results of this study and others is consistent nationwide. Additional research will help curriculum designers, profession development coordinators, agricultural educators, professors, and others better prepare students, agriculture teachers, and 4-H extension agents for a globalized economy. Recommendations for extension and agriculture teacher education, in-service educators, and future research are included below.

Today's agriculture students are being thrust into a world that is increasingly interconnected. It is crucial that formal and informal agricultural education programs prepare students for employment in a global economy. Recent studies indicate that

despite global education becoming a hot-button topic in the 1960s, global issues are still not implemented into agricultural education often enough (Ibezim & McCracken, 1994).

More research is necessary to determine what can be done to help teachers and agents integrate global issues into their work with agricultural youth. Integration of global issues would benefit the future agriculture workers in formal and informal agriculture programs. Without a change in the status of integration of international issues, the U.S. will continue to lose economic power (Schuh, 1989).

Recommendations for Extension and Agriculture Teacher Education

Based on the findings of this study, the following recommendations for extension and agriculture teacher education were made:

1. Agricultural teacher and extension educators should consider integrating more high-quality, purposeful international experiences into their undergraduate programs.
2. Educators of agriculture teachers and 4-H agents should provide more examples of how to integrate international issues into classes with youth/students.
3. Based on the finding that international experiences and perceptions are not related, which is inconsistent with previous research, more intentional international experiences should be developed. More intentional, high-quality experiences may have an effect on perceptions.

Recommendations for In-Service Educators

Based on the findings of this study, the following recommendations for in-service extension and agriculture teacher education were made:

1. In-service training and professional development regarding important current international issues may need to be improved both in terms of content and relevance to the needs of the teachers and agents participating
2. In-service educators should make an effort to increase their knowledge of international agricultural issues in order to better prepare their students for employment in a globalized workplace.

3. In-service educators should attempt to use global issues where applicable in their programs. Previous studies have indicated that secondary and postsecondary students lack knowledge of and experience with international issues, and that they are interested in learning about global issues.

Recommendations for Future Research

Based on the findings of this study, the following recommendations for future research were made:

1. Due to the low KR-20 found for the knowledge assessment, replication with a more reliable instrument in similar groups would be useful to determine the true level of teacher and agent knowledge of international agricultural issues.

2. Due to the finding that international experiences and perceptions were not related, inconsistent with prior research, a follow-up study using qualitative methodology should be done. This research should seek to determine why international experiences and perceptions were no related in this respondent group.

3. Inconsistent with prior research, this study found no relationship between demographic variables such as gender, years of experience, and work area and perception. Future research should further investigate these phenomena.

4. Future research should seek to determine if use of internationally-focused professional development workshops increase knowledge, perceptions, or integration of global agricultural issues.

5. Future research should seek to determine the impact of an educator-centered travel abroad experience on knowledge, perceptions, and integration of global agricultural issues.

6. Future research should take care to use more neutral terms in the survey instrument questions. For example, 4-H agents may not consider their work as falling into the “classes” terminology used by agriculture teachers.

7. Future research on international experiences should include an indication of when the experience most recently occurred. This information would be helpful in determining if the effect of international experiences decreases over time and how many participants have received in-service training.

Summary

Chapter 5 began with a review of this study’s purpose and objectives. Then conclusions for each objective were given. Chapter 5 then presented a discussion and implications regarding each objective. During the discussion and implications, each

objective's results were discussed in detail and compared for consistency or inconsistency with prior research. Finally, Chapter 5 gave several recommendations for extension and agriculture teacher educators, in-service educators, and future research.

APPENDIX A
SURVEY INSTRUMENT

Instructions
The following sections contain questions about knowledge, awareness, and understanding of international agriculture policy, products, people and culture. Please answer each item to the best of your ability. Answer all items completely. All your answers will remain confidential. Your participation in this study is voluntary.

Section I. Knowledge about International Agricultural Issues

Read each statement carefully and circle the letter that best represents your answer.

1. Generally, who carries out most of the field work on an African farm?
    a. Men & Children
    b. Men & Women
    c. Men
    d. Women

2. What is the primary household fuel in Africa and Asia?
    a. Natural gas
    b. Petroleum
    c. Wood
    d. Coal

3. According to the Food and Agriculture Organization of the UN (FAO), as of 2008, what percent of the world's population was undernourished?
    a. 10%
    b. 13%
    c. 16%
    d. 18%

4. According to the Intergovernmental Panel on Climate Change, as of 2007, which sector contributed the largest percentage of greenhouse gas emissions?
    a. Industry
    b. Agriculture
    c. Transport
    d. Energy supply

5. According to World Bank, what percent of the world's population used the internet in 2010?
    a. 10%
    b. 20%
    c. 30%
    d. 40%
6. Which following sequence correctly ranks, from most to least, the four languages most spoken worldwide?

   a. **Chinese, Hindi, English, Spanish**
   b. Chinese, Russian English, French
   c. English, Chinese, Arabic, Hindi
   d. Spanish, English, Russian, Arabic

7. In what part of the world are you most likely to find a hand-dug underground irrigation system called a ghanat (quanat) that may extend for many miles from the mountains to fields out to the plains?
   a. Eastern China
   b. **Middle East**
   c. South East Asia
   d. Central Africa

8. As of 2012, how many countries are members of the European Union?
   a. 21
   b. 23
   c. 25
   d. **27**

9. Although large areas of land are brought into cultivation throughout the world each year, large amounts are also rendered useless or are reduced in productive capacity for each of the reasons below except:
   a. wind and water soil erosion.
   b. salt buildup in irrigated land.
   c. **lack of sufficient farm labor.**
   d. converting agricultural land to other uses.

10. According to the FAO, which food sector uses a greater variety of biodiversity than any other?
   a. Grain production
   b. Red meat production
   c. Fruit and vegetable production
   d. **Capture fisheries**

11. The _____ desert is the world's largest hot desert.
   a. Kalahari
   b. **Sahara**
   c. Serengeti
   d. Sonoran

12. What country produces the largest volume of swine?
   a. **China**
   b. Brazil
   c. Mexico
   d. Japan

13. Which cereal grain is the basic food for more than half of the world's population?
    a. Wheat
    b. Oats
    c. Barley
    d. Rice

14. Considering developing and developed countries, the projection of the world population for the year 2050 shows the largest segment will be in:
    a. Africa
    b. Latin America
    c. Asia and Oceania
    d. North America and Europe

15. Which country is the largest producer of tea in the world?
    a. India
    b. Sri Lanka
    c. United Kingdom
    d. Bangladesh

16. In East Africa, it is expected that everyone will _____ upon greeting each other at a meeting, and upon departure from meetings.
    a. shake hands
    b. kiss both cheeks
    c. politely nod
    d. bow at the waist

17. According to UNESCO, as of 2000, approximately what percent of the urban population did not have piped water in its house?
    a. 15%
    b. 20%
    c. 25%
    d. 30%

18. As of 2010, the percent of useable land in the world for food production is:
    a. 7%
    b. 17%
    c. 27%
    d. 37%

19. According to the FAO, about how many crop species provide 95% of human food energy needs?
    a. 10
    b. 30
    c. 50
    d. 100

20. Which one of the following food nutrients is most lacking in the diets of the world's population?
    a. Proteins
    b. Vitamins
    c. Carbohydrates
    d. Fats

Section II. Attitudes about International Agricultural Issues

Listed below are statements relative to attitudes and beliefs toward international agricultural issues. Please indicate your level of agreement by checking the appropriate column for each statement.

	Disagree			Agree		
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
Youth/Students should know more about _____.						
1 agriculture and its importance to the world economy						
2 the differences between developed and developing countries						
3 other countries' markets for U. S. agricultural products						
4 the cultures of other countries						
5 their state's agricultural industry and its connections to world trade						
6 agricultural products that their home state sells to other countries						
7 how world agriculture affects food prices in the local grocery store						
8 how world events affect local agriculture in their community						
9 the agricultural products from other countries that are consumed in their state						
Please indicate your level of agreement with each of the following statements:						
10 learning more about agriculture in other countries will help youth/students understand future changes in world agricultural production.						
11 marketing agricultural products to other countries will help their state's economy.						
12 marketing U. S. agricultural products to other countries will help the U. S. economy.						
13 politics has a major effect on world agriculture.						
14 American culture has a major effect on agriculture in other countries.						
15 world events impact the agricultural industry in their community.						
16 global food production affects food prices in my local grocery store.						
17 if properly instructed, youth/students can understand basic international agricultural						

concepts.						
18 if properly instructed, youth/students can understand international career opportunities in agriculture.						
Youth/Students are more likely to understand global agriculture if instructed about _____.						
19 major agricultural products produced in their country						
20 major agricultural products produced in their home state						
21 major export markets for U. S. agricultural products						
22 countries that need U. S. agricultural products						
23 the economic issues between the U. S. and other countries						
24 the political issues between the U. S. and other countries						
25 the humanitarian issues between the U. S. and other countries						
Considering U. S. agricultural exports, youth/students should be instructed on other countries'_____ _____						
26 cultures						
27 infrastructure (educational system, transportation system, major industries, etc.)						
28 standard of living						
29 natural resources						
30 agricultural production practices						
Lessons on global agricultural issues should _____.						
31 not be too complex for youth/students						
32 help youth/students appreciate the interdependency of nations around the world						
33 prepare youth/students for future changes in global agriculture						
34 provide an opportunity for youth/students to interact with people in other parts of the world						
35 help youth/students understand global agricultural marketing systems						
36 help youth/students function better as a citizen in a global society						

Section III. Educator Beliefs about Global Agricultural Issues

	Disagree			Agree		
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1 international agriculture involves more than farming						
2 global agriculture is different from one country to another						
3 global food production allows me to eat a variety of products all year						
4 natural disasters affect the price of food in my local grocery store						
5 in times of famine, the U. S. should help other countries with food aid						
6 the US should actively help other countries develop their agricultural industries						
7 competition between producers worldwide keeps food prices low in my grocery store						
8 understanding other cultures helps U. S. producers market their products abroad						
9 understanding global politics helps U. S. producers market their products abroad						
10 US agricultural products are superior in quality to products from other countries						
I learn about global agricultural issues from _____.						
11 watching selected television programs						
12 listening to selected radio programs						
13 attending events such as fairs or shows						
14 participating in study abroad programs						
15 taking vacations in other countries						
16 my college classes						
17 professional development						
It is important for youth/students to learn about _____.						
18 global food security and hunger						
19 climate change						
20 sustainable energy						
21 childhood obesity						
22 food safety						

Section IV: Educator Experiences

	Please indicate if you have had the following experiences:		
1	participated in a short term study abroad experience as a student (1 to 3 weeks)		
2	participated in a long term study abroad experience as a student (> 3 weeks)		
3	took a globally focused course as a student		
4	lived outside the US for a short duration for professional reasons (< 1 year)		
5	lived outside the US for a long duration for professional reasons (> 1 year)		
6	participated in professional development workshop(s) with a global focus		
7	integrate global examples or case studies in classes you teach		
8	lived outside the US for a short duration for personal reasons		
9	lived outside the US for a long duration for personal reasons		
10	traveled internationally for personal reasons (i.e. vacation, etc.)		
11	Do you have any international experiences that are not reflected in the list above? If so, what are they?		

Open ended:

1. How often do you integrate global issues into your work with youth/students?

2. What activities do you currently use to inform youth/students about international agriculture and global food issues?

3. What would make globalizing your work with youth/students easier?

Section IV. Demographics

1. Gender:

   __ Female __ Male

2. Years of experience as an agriculture teacher or 4-H agent:

   _____

3. In what state do you work?

_____

4. Would you describe the community in which you do most of your work as:

   __ Rural __ Suburban __ Urban

5. People in the U.S. come from different ancestries. Check the one below that best describes your family's ancestry.

   __ European/Caucasian
   __ Mexican/Latin American
   __ Asian
   __ Native American
   __ African American
   __ Arab
   __ Puerto Rican
   __ Other Caribbean ancestry

APPENDIX B
IRB APPROVAL AND INFORMED CONSENT

UF | Institutional Review Board
UNIVERSITY of FLORIDA

PO Box 112250
Gainesville, FL 32611-2250
352-392-0433 (Phone)
352-392-9234 (Fax)
irb2@ufl.edu

DATE: September 12, 2012

TO: Sara Hurst
PO Box 110540
Campus

FROM: Ira S. Fischler, PhD, Chair
University of Florida
Institutional Review Board 02

SUBJECT: **Approval of Protocol #2012-U-0896**

TITLE: Integration of Global Issues in Agriculture Programs

SPONSOR: None

I am pleased to advise you that the University of Florida Institutional Review Board has recommended approval of this protocol. Based on its review, the UFIRB determined that this research presents no more than minimal risk to participants, and based on 45 CFR 46.117(c), An IRB may waive the requirement for the investigator to obtain a signed consent form for some or all subjects if it finds either: *(1) That the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern; or (2) That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context.*

The IRB authorizes you to administer the informed consent process as specified in the protocol. If you wish to make any changes to this protocol, ***including the need to increase the number of participants authorized***, you must disclose your plans before you implement them so that the Board can assess their impact on your protocol. In addition, you must report to the Board any unexpected complications that affect your participants.

This approval is valid through **August 28, 2013.** If you have not completed the study by this date, please telephone our office (392-0433), and we will discuss the renewal process with you. **Additionally, should you complete the study before the expiration date, please submit the study closure report to our office.** The form can be located at http://irb.ufl.edu/irb02/Continuing_Review.html. It is important that you keep your Department Chair informed about the status of this research protocol.

ISF:dl

Informed Consent

Protocol Title: Integration of Global Issues in Agriculture Programs

Please read this consent document carefully before you decide to participate in this study

Purpose of the research study:

The purpose of this study is to investigate how educator knowledge, perceptions, and experiences with global agricultural issues affect integration of these issues into their educational activities.

What you will be asked to do in this study:

If you choose to participate, you will be asked to complete an online survey.

Time Required:

Approximately 15-25 minutes

Approved by
University of Florida
Institutional Review Board 02
Protocol # 2012-U-0896
For Use Through 08-28-2013

Risks and Benefits:

There are no anticipated risks or benefits from participating in this study.

Compensation:

You will not receive compensation for participating in this research

Confidentiality:

No identifying information will be collected, so your responses will be anonymous.

Voluntary participation:

Your participation in this study is completely voluntary. There is no penalty for not participating. If you choose to participate, you do not have to answer any question you do not wish to answer. By accessing the survey, you are acknowledging that you have consented to participate in the study.

Right to withdraw from the study:

You have the right to withdraw from the study at any time without consequence.

Whom to contact if you have questions about the study:

Sara Hurst, Graduate Student, Department of Agricultural Education and Communication, 406 Rolfs Hall P.O. Box 110540 Gainesville, FL 32608, (352)-273-2568, sdhurst@ufl.edu

T. Grady Roberts, PhD, Department of Agricultural Education and Communication, 117C Bryant Hall P.O. Box 112060, Gainesville, FL 32611, (352)-273-2568, groberts@ufl.edu

Whom to contact about your rights as a research participant in the study:

IRB02 Office, Box 112250, University of Florida, Gainesville, FL 32611-2250, (352)-392-0433

APPENDIX C
SURVEY PRENOTICE EMAIL

Alabama example- a different name was used in the salutation to personalize the prenotice to each state.

Alabama 4-H Agents,

I am writing to ask you for your help with an important study being conducted by the University of Florida to understand the integration of global agricultural issues into secondary agriculture classes. In the next few days, you will receive a request from the email address noreply@qemailserver.com to participate in this project by answering questions about your knowledge, perceptions, and experiences regarding global agriculture. This study has been approved by the National Association of Extension 4-H Agents and will contribute valuable information.

I would like to do everything I can to make it easy and enjoyable for you to participate in the study. I am writing in advance because many people like to know ahead of time that they will be asked to fill out a questionnaire. This research can only be successful with the help of generous people like you.

To say thanks, I am including a document outlining the previous research done on this topic, which you can find attached to this email. The document “Current State of Integration of Global Issues” covers the importance and purpose of the study, along with a summary of previous research. I have also included resources for educating youth about global agricultural issues, and some information about me. I will also be following up with a summary of the results of this study, which will be emailed to all invitees and shared with NA4-HEA.

I hope you will take 15-25 minutes of your time to help us. Most of all, I hope that you enjoy the questionnaire and the opportunity to voice your thoughts and opinions about the integration of global agricultural issues. Please contact me with any questions or concerns you have, [redacted] or [redacted].
Thank you!
Sara

Sara Hurst
Graduate Student
Dept. of Agricultural Education and Communication
406 Rolfs Hall
[redacted]

APPENDIX D
INITIAL SURVEY INVITATION E-MAIL

Hi ${m://FirstName},

I'm working with Dr. Grady Roberts to investigate how agriculture teachers and 4-H agents nationwide integrate global issues into their work with youth/students. I am conducting this research in order discover how teachers and agents are succeeding in integrating global issues, and what resources would be helpful in encouraging more integration. The best way to find out what teachers and agents need is to ask teachers and agents like yourself to share their thoughts and opinions.

This is a short survey and should take no more than 15-25 minutes to complete. Please click on the link below to access the survey website and begin the survey.

Follow this link to the Survey:
${l://SurveyLink?D = Take the Survey}

Or copy and paste the URL below into your internet browser: ${l://SurveyURL}

Your responses are voluntary and will be kept confidential. If you have any questions about this survey, or you have difficulties with the survey, I am happy to help and can be reached by telephone at [redacted], or by email at [redacted]. This study has been reviewed and approved by the University of Florida Institutional Review Board and by entering the survey you are agreeing to participate in the study. If you have questions about your rights as a participant in this study, you may contact them by phone at (352)392-0433.

I appreciate your time and consideration in completing the survey. Thank you for participating in this study! I hope you enjoy completing the questionnaire and look forward to receiving responses.

Thanks!

Sara

Sara Hurst
Graduate Student
Dept. of Agricultural Education and Communication
406 Rolfs Hall
[redacted]

APPENDIX E
FIRST REMINDER E-MAIL NOTICE

Hi ${m://FirstName},

Last week I sent you an email asking you to respond to a brief survey about how agriculture teachers and 4-H agents nationwide integrate global issues into their work with youth/students. Your responses to this survey are important as they will help in developing resources such as curriculum and lesson plans to make teaching about global agricultural issues easier in the future.

I know you are extremely busy, but this survey is short and should take you only about 15-25 minutes to complete. If you have already completed the survey, I appreciate your participation.

Please click on the link below to go to the survey website and begin the survey.

Follow this link to the Survey:
${l://SurveyLink?D = Take the Survey}

Or copy and paste the URL below into your internet browser: ${l://SurveyURL}.

Your response is important. Getting direct feedback from teachers and 4-H agents is crucial in improving the quantity and quality of education materials available. Thank you for your help by completing the survey.

Sincerely,

Sara

Sara Hurst
Graduate Student
Dept. of Agricultural Education and Communication
406 Rolfs Hall
[redacted]

Follow the link to opt out of future emails: ${l://OptOutLink?D = Click here to unsubscribe}

APPENDIX F
SECOND REMINDER E-MAIL NOTICE

Agriculture Teacher example- Notices were changed to read “NAE4-HA convention” rather than “National FFA Convention.”

Hi ${m://FirstName},

At this time, you have received several requests asking you to respond to a brief survey about how you incorporate global agricultural issues into your work with youth/students. As we work to develop strategies to enhance and assist you in incorporating international issues, it is imperative we get feedback from the field.

You are receiving this follow-up email if you haven't completed the survey at this time **or** if you have completed part of it. If you have completed part of it, please complete the rest by clicking on the link below. If you have already begun the survey, the system will have saved your responses up to this point and will start you where you left off.

I realize you have probably had a busy week at FFA National convention, but if you could take the 15-25 minutes to complete the survey, we would really appreciate it.

Please click on the link below to go to the survey website and begin the survey.

Follow this link to the Survey:
${l://SurveyLink?D = Take the Survey}

Or copy and paste the URL below into your internet browser: ${l://SurveyURL}

As many of you already know, this is a multi-state study designed to assist in developing curriculum and resources for educators nationwide. Getting a high response to this survey is an important part of being able to make good judgments about what works for you in relation to integration of globalized curriculum. Many have taken the time to respond, so we would really appreciate your participation.

Again, your response is extremely important. If you believe you are receiving these notifications in error, please let me know. Thank you for your help by completing the survey, and have a fantastic week!

Sincerely,

Sara

Sara Hurst
Graduate Student, University of Florida
Dept. of Agricultural Education and Communication

406 Rolfs Hall
[redacted]

APPENDIX G
THIRD REMINDER E-MAIL NOTICE

Hi ${m://FirstName},

The Global Agricultural Issues survey is about to close! Over the past few weeks, you have received several requests asking you to respond to a survey about how you integrate global agricultural issues into your work with youth/students. This survey will be **closing at 5pm on Friday, November 9th,** and we need as many responses as possible. It is truly imperative we get the feedback from the field that this survey provides.

If you could please find 15-25 minutes to complete the survey this week we would really appreciate it.

Please click on the link below to go to the survey website and begin the survey.

Follow this link to the Survey:
${l://SurveyLink?D = Take the Survey}
Or copy and paste the URL below into your internet browser: ${l://SurveyURL}

Again, your response is extremely important. If you believe you are receiving these notifications in error, please let me know. Thank you for your help in completing the survey and have a great week!

Sincerely,

Sara

Sara Hurst
Graduate Student, University of Florida
Dept. of Agricultural Education and Communication
406 Rolfs Hall
[redacted]

Follow the link to opt out of future emails:
${l://OptOutLink?D = Click here to unsubscribe}

APPENDIX H
SURVEY CLOSING E-MAIL NOTICE

Hi ${m://FirstName},

This is your last chance! The Global Agricultural Issues survey **will close at 5pm today!**

If you could please hop online and complete the survey I would really appreciate it.

To do so click on the link below to go to the survey website and begin the survey.

Follow this link to the Survey:
${l://SurveyLink?D = Take the Survey}

Or copy and paste the URL below into your internet browser: ${l://SurveyURL}

Your response is extremely important and thank you so much for your time!

Have a wonderful weekend.

Sara

Sara Hurst
Graduate Student, University of Florida
Dept. of Agricultural Education and Communication
406 Rolfs Hall
[redacted]

APPENDIX I
EXPERTS

Panel of Experts for the Survey Instrument

Gary Wingenbach, PhD
Professor and Senior Scientist
Norman Borlaug Institute for International Agriculture
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
2116 TAMU
College Station, TX 77843-2116

Kristin Davis, PhD
Research Fellow
Senior Research Staff
Global Forum for Rural Advisory Services
International Food Policy Research Institute
2033 K St, NW
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Pete Vergot III, PhD
District Extension Director
University of Florida IFAS Extension
Professor
Agricultural Education and Communication
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Walter Bowen, PhD
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BIOGRAPHICAL SKETCH

Sara D. Hurst grew up in Lutz, Florida, a suburb of Tampa. Sara was involved in agriculture from a young age, and joined FFA in 6th grade. She was a member and an officer throughout high school, graduating in 2007 from Freedom High School in Tampa, Florida.

Upon graduation, Sara attended the University of South Florida where she majored in Environmental Science and Policy. After two years, she transferred to the University of Florida to pursue her bachelor's degree in Agricultural Education and Communication, specializing in agricultural education, graduating in 2011.

Upon completion, Sara accepted a graduate assistantship at the University of Florida in Agricultural Education and Communication department to work on her master's degree. As a graduate assistant, Sara provided support for PhD lecturers in the class AEC3033: Research and Business Writing. Sara also conducted research related to short term study abroad experiences, perceptions of international agricultural issues, agricultural systems of other countries, teacher education learning communities, and preflection and reflection as related to student understanding.