Assessing Extension Needs of Ohio’s Amish and Mennonite Produce Auction Farmers

Thesis

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By

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Abstract

Cooperative Extension has a 100-year history of working within the national system of land-grant universities to assist in the growth of farmers and the agriculture industry. Amish and Mennonite farmers are one of the producer groups that directly benefit from the Extension system. In order to provide effective future Extension programming efforts for this particular clientele, a mail survey was conducted to describe Ohio Amish and Mennonite farmers who participate at Ohio produce auctions, especially their communication and educational needs.

A profile of the typical Ohio Amish or Mennonite farmer who sells at Ohio produce auctions is a white male aged 30 to 49 years and farming is his primary occupation. Ninety-four percent (94%) of respondents have less than a twelfth grade education and 84% don’t belong to any Ohio farm organization or association. Less than 3% of Ohio Amish and Mennonite produce farmers use the Internet to obtain farming information. Fifty-six percent (55.6%) of Ohio Amish and Mennonite farmers reported annual farm sales of $10,000 to $49,999 while 5.9% reported sales of $100,000 to $500,000 with 60.9% reporting that more than 50% of their farm income is generated through produce sales. Fifty-two percent (52.1%) of respondents use a combination of organic and conventional farming practices but only 5% are certified organic.
Ohio Amish and Mennonite produce auction farmers obtain information from a variety of sources. The top three sources of information used 10 or more times a year are university bulletins, newsletters, newspaper and magazine articles. Amish and Mennonite produce auction farmers also communicate more than 10 times a year with other farmers in their community and they do not use Information and Communication Technology (ICT’s) to acquire information with 97% never using the Internet. More than 94% of Ohio Amish and Mennonite produce farmers are aware of Ohio State University Extension and greater than 83% have used or benefited from OSU Extension in the past. These data indicate that Ohio State University Extension has contributed to the success of Ohio Amish and Mennonite produce farmers by providing information sources that increased knowledge applicable to their produce farming businesses. Ohio Amish and Mennonite produce farmers ranked crop nutrition, insect management, disease management, soil fertility and food safety as topics of greatest importance in terms of their Extension needs.

This research was to determine extension methods best suited for Ohio Amish and Mennonite produce farmers. A multiple-output extension strategy, requiring more interpersonal contacts should be used. An opportunity also exists to reach those Amish and Mennonite produce farmers not currently utilizing the resources available from the OSU South Centers at Piketon. Findings from this study can be used to develop new programs designed to address extension needs of Ohio Amish and Mennonite produce farmers.
Dedication

Dedicated to my mother, Marigene Bergefurd and father Robert Bergefurd who have always encouraged, supported and believed in all I have ever pursued,

and

my wife, Marcia Bergefurd, my biggest supporter,

my daughter Ashley and my sons Brandon, Bryant and Brady Bergefurd

for they are why I study and work so hard.
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Field of Study
Major Field: Agricultural and Extension Education
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Chapter 1: Introduction

The Extension Service

The Extension Service is the world’s largest public funded non-formal education and development organization with a heritage of transferring the knowledge of the universities to local clientele. It is an outreach of the land-grant university and the United States Department of Agriculture (USDA) to the people of each state (Graham, 1994). It is America’s first and only national system in adult education (Boone, 1985). Extension is a cooperative educational relationship among three levels of government. The federal partner is the USDA, the state partner is the land-grant university and the county partner is local government (Graham, 1994). It was created in 1914 by the Smith-Lever Act, with the specific purpose of “diffusing among the peoples of the United States useful and practical information on subjects relating to agriculture and home economics, and to encourage application of the same,” with key words being people, information, and application (Christian, 1959). It was created particularly to address the needs of the population, whether rural or urban, but with more early emphasis on rural (Christian, 1959). According to Graham (1994,) the Extension System serves a common mission of helping people help themselves. Although the number of local extension offices has declined, and some county offices have consolidated into regional extension centers, there remain approximately 2,900 extension offices nationwide.
What is OSU Extension’s mission?

Ohio State University Extension’s mission is to “help people improve their lives through an educational process using scientific knowledge focused on identified issues and needs, engaging people to strengthen their lives and communities through research-based educational programming” (Ohio State University Extension, 2010). “Ohio State University Extension has a vision to be broadly recognized throughout the state as a premier educational network. It is a dynamic organization strengthening individuals, families and communities in partnership with the Federal Extension System”, (Ohio State University Extension, 2010).

Extension Clientele

In the first national study on participation in adult education, Johnstone and Rivera (1965) offered a profile of the adult learner and categorized barriers to participation as: (1) situational, including time, money, and transportation; (2) institutional, pertaining to the service provider; (3) socio-demographic, like age, gender, race; and (4) dispositional factors such as feelings toward group participation. Houle (1961) developed the idea that the motivation among adult learners varies considerably, but learners typically fall into one of three subgroups: goal-oriented, activity-oriented, or learner-oriented. Burgess (1971) identified several motivations of adults who choose to participate in a learning experience: they want to know; they’ve engaged in some activity; they need to meet a work-related requirement; or they simply want to escape.

Adults participate in Extension educational programs for a variety of reasons. In a 1987 survey of Ohio Extension clientele, five factors influenced participation: low anticipated difficulties with arrangements, high commitment to the Extension
organization, anticipated positive social involvement, anticipated high quality of the information and possession of high internal motivation to learn (Norland, 1992).

Extension provides an important linkage between farmers and researchers, and farmers have come to value the services they receive from Extension (Ekanem, Singh, Tegegne, & Akuley-Amenyenu, 2001). Not only does the Cooperative Extension Service strive to meet the needs of large production farms, it also seeks to fulfill the needs of small-farm landowners, non-traditional producers, and homeowners (Polson and Gastier, 2001).

Extension serves a growing, increasingly diverse constituency with fewer resources and funding (USDA, 2009). According to Alves (1993), working with Native American audiences or any culturally diverse group means Extension educators must adapt their traditional methods for reaching audiences. While the strategies for taking a different approach may not be difficult, implementing them is a challenge requiring a high degree of commitment to cultural understanding (Alves, 1993). To reach black farmers with information on new technologies in agriculture, Extension must capitalize on the farmers’ interactions with each other (Hunte, 1989). In a study of tailoring Extension pesticide applicator training to Amish audiences, it was concluded that hands-on experiential learning is the preferred mode (Slates, Kick-Raack, Beck, 2001). Extension has to prioritize its programs to meet farmers with limited resources, and at the same time it has to develop new communication techniques to reach a variation of clientele (ECOP Report, 2002).
Extension methods

Extension teaching methods have utilized Information and Communication Technology (ICT) as it has evolved over the years. ICT broadly describes the technological platforms (e.g., the Internet) and devices (e.g., mobile phones, computers, e-readers, etc.) widely used by individuals to communicate with others and gather and process information. It is a collective term given to the new generation of information technologies spawned by the merger of computers and telecommunications (Flor, 2001). Reliance on ICTs has grown substantially since the advent of the personal computer in 1981 (Rodman & Fry, 2009). One feature of ICT is the convergence of media (print, audio, video, multimedia, etc.) made possible by a common digital platform such as the Internet. Internet usage reaches deep into American society with 119 million households (69%) having Internet use at home (U.S. Census Bureau, 2009). This figure is quickly rising; Internet usage was only 42% in 2000 (U.S. Census Bureau, 2009). In the United States 79% of adults report using the Internet at a workplace, school, home, or other location on at least an occasional basis (Rainie, 2010). Similar patterns have been found in growing numbers of American families, with the highest household ICT adoption rates to date in married-couple with children households (Kennedy, Smith, Wells, & Wellman, 2008). Attempts to define, understand, and explain the mechanisms and constraints of adopting ICT are not new. Grilliches (1957) studied the economics of technological change using hybrid corn adoption as a case study and Grilliches (1998) also identified a specific ten-year lag in a technological change adoption process in agriculture. Gelb and Kislev (1982) quantified farmer preferences for technological change via their financing of agricultural research. Gelb and Offer (2005) provided an overall review of ICT
adoption in agriculture focusing on various perspectives of technological innovation over time. Rogers (1962) formalized change adopter categories, in this case farmers adopting ICT. A quantitative evaluation of agricultural software availability and trends since 1990 by Gelb et al. (1997) suggested that by 1997, ICT, as an innovation case study, was no longer an agricultural production novelty. Results showed a wide range of constraints, impediments and reasons for different rates of ICT adoption, alternatives and results, or what is called a digital divide. Recognizing that there is a ‘digital divide,’ in which some members of society or some areas of the world are left behind those that have ready access to advanced ICTs (Odame, Hafkin, Wesseler, and Boto, 2002). In the information oriented society, the information-poor have become the resource-poor (Roy, 2009). The poor, illiterate, displaced or disabled person, racial and ethnic minorities and other social groups could be left behind by the ICT (Roy, 2009).

**ICTs and Amish and Mennonites**

Umble (1992) elaborated on why the Amish have resisted the adoption of telephony, which encompasses the general use of equipment to provide voice communication over distances, specifically by connecting telephones to other types of communication technology (Merriam Webster, 2010). The Amish live by the concept captured in the German word *Gelassenheit*, a word used to convey the ideal which each member is to strive for and means submission-yielding to higher authority (Umble, 1992). In practice, “Faith permeates every aspect of social practice and provides the context in which social relationships are managed” (p. 185). It is in this context that telephone service, introduced to the Lancaster County area of Pennsylvania in 1879, was officially banned within the Amish community in 1909. The use of the telephone is not
banned today “community phones” with unlisted numbers can be found in separate structures, such as at the end of lanes, beside barns, or in the garage of a non-Amish neighbor, where six or seven Amish families in a particular neighborhood can have access to this “necessary” communication tool without the disruption of social order. Within the Amish community, communication technology and the “industries that promote them are not the sole agents of influence or control” (p. 192). According to Umble, “community telephones remind the Amish communicator that their point of reference is within the community, not the outside world, even in the act of using the telephone” (p. 192). According to Weaver (2010), “We rely on our Extension Educator for information to teach us how to solve our problems, we cannot use computers, the internet or e-mail and we do not have telephones in the house so the only way we can get our information is for our Extension educator to stop by the farm and teach us how to fix our problems” (personal communication, Fred Weaver, November 15, 2010).

Amish groups include Old Order and New Order that use horse-and-buggy transportation, but exclude car-driving groups such as the Beachy Amish and Amish Mennonites (Young Center for Anabaptist and Pietist Studies, 2010). According to the Young Center for Anabaptist and Pietist Studies, in the 20-year period from 1991 to 2010, the Amish of North America (adults and children) doubled in population from 123,550 in 1991 to 249,500 in 2010. Amish communities are located in 28 states and the Canadian province of Ontario. Historically, Ohio, Pennsylvania, and Indiana have claimed about two-thirds of the North American Amish population, but Amish also live in the states of Arkansas, Colorado, Florida, Kansas, Maine, Michigan, Mississippi, Nebraska, North Carolina, South Dakota, West Virginia, Montana, Virginia, Kentucky,
New York, Tennessee, Minnesota, Missouri, Wisconsin, Illinois, Iowa, Maryland, Oklahoma, Delaware and Texas (Young Center for Anabaptist and Pietist Studies, 2010).

The Amish establish new settlements in states that already have Amish communities as well as in new states for a variety of reasons including: (1) fertile farmland at reasonable prices, (2) non-farm work in specialized occupations, (3) rural isolation that supports their traditional, family-based lifestyle, (4) social and physical environments (climate, governments, services, economy) conducive to their way of life, (5) proximity to family or other similar Amish church groups, and sometimes to (6) resolve church or leadership conflicts (Young Center for Anabaptist and Pietist Studies, 2010). The primary forces driving the growth are sizeable nuclear families, five or more children on average, and an average retention rate, Amish children who join the church as young adults, of 85 percent or more (Young Center for Anabaptist and Pietist Studies, 2010).

**Ohio Amish and Mennonite Farmers**

Approximately 24% or nearly 58,590 Amish live in Ohio. This ranks Ohio as the leading state in Amish population over Pennsylvania with nearly 52,000 and Indiana with nearly 39,000 (Young Center for Anabaptist and Pietist Studies, 2010). Population pressure has forced the Amish to have smaller farms, engage in specialized farm enterprises, and carefully assess the influence of technology on their community life (Hostetler, 1993). Diminishing farm size and the high price of land have forced the Amish into more intensive land use (Hostetler, 1993).

To adhere to its mission, the OSU Extension methods that best reach clientele need to be identified and developed. With the Amish and Mennonite clientele, Extension
needs to be cognizant of their diversity and focus on extension methods which achieve their participation, which is the basis for this study.

**Local foods opportunities**

The Amish and Mennonite communities are capturing the changing agricultural markets by an increase in specialized farming raising crops for cash such as tobacco, potatoes, tomatoes, and peas (Hostetler, 1993). “I can make $10,000 off an acre of cauliflower, that’s good money for my farm,” said Fred Weaver who cultivates 70 acres near Rainsboro, Ohio (Weaver, November, 10, 2010). Food miles are the distance food travels from where it is grown to where it is ultimately purchased or consumed by the end user (Pirog, 2003). Since the late 1990s, food mile has become a new term in relation to an environmentally sustainable agri-food system (Iles, 2005). Growing consumer interest in local and regional foods is creating new marketing opportunities and new possibilities for partnerships with agricultural producers (Hill, 2008).

Buy local is one of the biggest food trends at the moment (Finnamore, 2008). Sales of local foods grew from $4 billion in 2002 to $5 billion in 2007 and are projected to reach $11 billion in 2011 (Packaged Facts, 2007). Consumer demand for food that is locally produced, marketed, and consumed is generating increased interest in local food throughout the United States (USDA, 2010). Local is so popular that in 2008 Congress passed H.R.2419 which amended the Consolidated Farm and Rural Development Act where the terms locally and regionally were grouped together and defined as:

“(1) the locality or region in which the final product is marketed, so that the total distance that the product is transported is less than 400 miles from the origin of
the product; or (2) the State in which the product is produced” (Library of Congress, 2008).

One way Amish and Mennonite farmers are capturing profits of the locally grown movement is by selling their produce at community-based produce auctions. A produce auction is a market outlet for locally grown wholesale products where fresh produce, as well as a variety of other agricultural products, are offered for sale to the highest bidder and charges the seller a commission, usually a percent of sales, to cover the auction’s operating expenses (Woods & Ernst, 2010). Beginning in 1992 the first of eight produce auctions was established in Middlefield, Ohio (Gemuse Verkaufhause, 2003). Buoyed by a hunger for all foods local, the produce auction is drawing bids from big name grocers down to individual “farm fresh” enthusiasts throughout Ohio (Our Ohio, 2009).

Another recent local marketing movement that Amish and Mennonite farmers are seeing as advantageous for their farms is Community Supported Agriculture (CSA). The USDA (2010) defines CSA as consisting of a community of individuals who pledge support to a farm operation so that the farmland becomes, either legally or spiritually, the community’s farm, with the growers and consumers providing mutual support and sharing the risks and benefits of food production. Typically, members or share-holders of the farm or garden pledge in advance to cover the anticipated costs of the farm operation and farmer’s salary, in return they receive shares in the farm’s bounty throughout the growing season, as well as satisfaction gained from reconnecting to the land and participating directly in food production. Members also share in the risks of farming, including poor harvests due to unfavorable weather or pests. By direct sales to community members who have provided the farmer with working capital in advance,
growers receive better prices for their crops, gain some financial security, and are relieved of much of the burden of marketing (USDA, 2010.) According to Appropriate Technology Transfer for Rural Areas (ATTRA), CSA was introduced to the United States in approximately 1985, but has been practiced in Europe and Japan for a number of decades. In 1986 Jan Vander Tuin started the first CSA in Massachusetts, and there are now approximately 600 CSAs in North America (ATTRA, 2010). Some Amish farmers also offer a CSA with their dairy herds such as Vern Yoder of Yoder Family Farms of Winchester, Ohio. “The consumer will buy a share of my dairy herd and receive their weekly or biweekly share of the milk,” says Vern (Yoder, 2010).

Woods, Ernst, Ernst, and Wright (2009) write that websites and blogs were viewed as the second most effective promotion channels, which included the CSAs own web site or that of a secondary provider. More than 85% of CSAs surveyed found direct e-mail a very effective means of communicating with members, and over half found website communication helpful. Only 35% rated direct mail communication effective (Woods, et.al, 2009). The survey also found that computer usage was heaviest for those with over 50 members.

Small farms play an important role in the local food movement and in the U.S. agricultural sector and are becoming an increasingly large proportion of the farming population (USDA, 2006). The Economic Research Service (ERS) in its Farm Typology Group Definition uses the definition of “small farm” developed by the National Commission on Small Farms. The Commission used $250,000 in gross sales as its cutoff between small and large farms in its report, A Time to Act (USDA, National Committee on Small Farms, 1998). This definition was instituted in 1997 by the Secretary of
Agriculture to examine issues facing small farms and is still used today. At the Third National Small Farm Conference in Albuquerque, New Mexico in 2002, USDA representatives noted, among other things, that: a) relatively little research-based information is available to small farmers; b) small farmers have different cultural, educational and social backgrounds and therefore, face language barriers (and some have limited education); c) small farmers have extreme problems competing in global markets because of their small size, raising the question whether small farmers must focus on direct or local marketing versus global markets; d) small farmers needs are multifaceted and therefore may require a systems approach to analysis and solution; and e) Extension workers may not be meeting the needs of small farmers (Gallegos, 2002).

Although there have been many research studies completed by rural sociologists on the diffusion and adoption of farm innovations (Sheaffer, 2000; Sumberg, Okali and Reece, 2002; Crosscombe, 2003), a search of the literature disclosed the present study was the first to investigate extension methods employed among Amish and Mennonite produce farmers.

In a study of Amish farmers regarding agricultural pollution of ground water, Sommers and Napier (1993) concluded that informal communication systems have made Amish farmers aware of potential environmental problems associated with agricultural pollution of ground water. They concluded that Amish farmers may be receptive to external action programs designed to address identified environmental problems if the programs are perceived to be relevant to their needs and appropriately introduced to client populations. Such programs need to recognize the unique cultural situation of Amish groups to be acceptable.
Evolving and multiple learning contexts, such as ICT, coupled with changing and expanding learning needs of citizens, always has been a characteristic of relevant, research-based, and high-quality Extension education (Bull, Cote, Warner, & McKinnie, 2004). The challenge is how ICT and the powers of advanced information technology can be harnessed for the benefit of both Extension specialists and farmers without compromising the importance of human and unique local factors. The result is clear: our social institutions, including the Cooperative Extension System, will need to change in order to effectively serve the diversity of communities and families across this nation. (Ingram and Radhakrishna, 2002).

As stated by Rodewald (2001, p. 1), “the key to successful delivery is to know your audience.” How will Extension use new ICT technology while continuing to give clientele the personal interaction they desire? The use of technology should not hinder interactions with clientele. Trede and Miller (1993) mentioned a few important factors Extension educators need to focus on in order to serve their clients to the best of their abilities including clients’ needs, learning styles, the process of educational development, and delivery systems.

The diversity which exists among farmers in U.S. agriculture today is evidently a new dimension of change in agriculture. Approximately 2.4 million refugees have come to the United States since 1975, seeking protection from persecution and in search of freedom, peace, and opportunity for themselves and their families (USDA, 2010). After a period of adjustment, many look to micro-enterprise and small businesses as a way to establish a new life. With many refugees coming from agrarian societies, it is not surprising that small-scale farming is a popular option for them (USDA, 2010). The
extent to which Extension administrators work with, support and understand Amish and Mennonite produce farmers indicates Extension’s role as the facilitator of information exchange of new ideas and networking with this group of clientele. Extension cannot help the Amish and Mennonite farmers without knowing what their information needs are or how to effectively communicate this information.

Background, Setting and Problem Statement

Eighty percent of Americans relying on the use of ICTs (Rainie, 2010), more farmers are growing for the local foods market, and Amish and Mennonite populations have doubled in the past 20 years (Young Center for Anabaptist and Pietist Studies, 2010). A search of the literature disclosed that little research had been done to identify the extension needs of Amish and Mennonite produce farmers. This study identified Extension methods most appropriate to these clientele and to understand what their Extension needs are. The research problem was to examine what Extension methods should be considered for Amish and Mennonite produce farmers in Ohio given their unique cultural difference. The research question is: Given that Amish and Mennonites are somewhat ethnically different from their mainstream counterparts, what extension methods are preferred by them?

Justification of the study

The main justification for this study is that OSU Extension is facing many challenges including a declining budget and an expanding demand by differentiated stakeholders (Ohio State University Extension, 2010). By identifying extension methods best suited to Amish and Mennonite client groups, and doing a good job of helping these farmers, respect for Extension will follow. Seeing how invaluable Extension is to their
businesses and livelihoods, clientele may develop an interest in paying for Extension Services, hence, bringing into play a demand-driven or cost recovery Extension Service. In the long run, this may reduce the financial burden of providing Extension programs, and may very well be an effective way of holding Extension accountable to its stakeholders. An example of this, suggested by the Amish and Mennonite produce farmers, would be the implementation of fee based Integrated Pest Management (IPM) scouting programs to help farmers manage their pesticide applications and expenses.

**Purpose and Objectives of Study**

The purpose of this study was to determine what extension methods are preferred by Amish and Mennonite farmers that address their needs. Buford, Bedeian and Lindner (1995) urge Extension managers to be socially responsible by addressing the needs and concerns of the disadvantaged farm population. In order to accomplish this purpose, data from Ohio Amish and Mennonite produce farmers who are registered at Ohio produce auctions were collected.

The objectives of the study were as follows:

1. Describe the characteristics of Ohio Amish and Mennonite produce farmers and their operations.
2. Determine awareness of and participation in Extension programs by Ohio Amish and Mennonite produce farmers.
3. Determine the methods of communication used by Ohio Amish and Mennonite produce farmers to acquire farming information.
4. Identify extension topics for future Extension programming with Ohio Amish and Mennonite produce farmers.
**Organization of the Study**

The remainder of this study is organized as follows:

Chapter 2 reviews the literature on extension to describe the use of particular communications methods in a homogeneous society. Chapter 3 discusses the research methodology, including population sampling, instrumentation, data collection and analysis. Chapter 4 presents the findings. Chapter 5 presents a discussion, summary, conclusions and recommendations based on the study. Finally, a references list and appendices of materials used in this study are provided.

**Definition of Terms**

The following terms require an explanation as to how they will be interpreted and applied within the context of this research. These terms are listed alphabetically and operationally defined as they will be used in this study.

- **Amish.** A sect of Mennonites who were followers of Jakob Amman and settled in America chiefly in the 18\(^{th}\) century (Nolt, 1992).

- **Community Supported Agriculture (CSA).** Consisting of a community of individuals who pledge support to a farm operation so that the farmland becomes, either legally or spiritually, the community’s farm, with the growers and consumers providing mutual support and sharing the risks and benefits of food production (USDA, 2010).

- **Extension.** A series of embedded communicative interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve (usually multi-actor) problematic situations (Leeuwis and van den Ban, 2004).
• **Extension program.** A comprehensive set of activities that are intended to bring about a sequence of outcomes among targeted clients, characterized by a focus on the needs of the target audience, the intent to affect participant learning and behavior outcomes, multiple activities that are comprehensive in nature, and the presence of a formal evaluation (Israel, Brodeur, & Harder, 2011).

• **Interpersonal Communication.** Involves few participants, the interactants are in close physical proximity to each other, there are many sensory channels used, and feedback is immediate (Gouran, Wiethoff, & Doelger, 1994).

• **Mennonite.** A Protestant denomination of Europe and America which arose in Switzerland in the sixteenth century and derived its name from Menno Simons, its leader in Holland (Weber, 2011).

• **Small farm.** Farms with annual sales less than $250,000 (USDA., National Commission on Small Farms, 1998).

• **Participation.** The degree to which members of an organization are involved in the innovation decision process (Green, 1986).

• **Participatory Extension Approach.** A cooperative approach to Extension programming where researchers, Extension personnel and farmers work together to assess Extension priorities to meet farmers’ needs (Hagmann, Chuma, Murwira, and Connolly, 1999).

• **Produce Auction.** A method and/or a place for selling products such as fruits, vegetables and flowers in a public forum through open and competitive bidding (Woods & Ernst, 2010).
Limitations of the Study

The following limitations were recognized in this study:

1. The timing of the survey during the busy produce growing season could have affected the survey response rate, for the farmers were still busy planting during this time period.

2. Due to the low education level of these farmers, they may have had difficulty reading and understanding the questionnaire and providing answers.

3. This study did not survey Amish and Mennonite produce farmers who do not market their produce at Ohio produce auctions.
Chapter 2: Review of Literature

Introduction

This interdisciplinary study draws on theories in communication, education, Extension, sociology and related areas to examine the extension methods suitable for meeting the needs of Amish and Mennonite produce farmers. The chapter is organized as follows: a) the practice of Extension and its shortcomings; b) participatory extension approach and its relevance to working with small holder farms in Ohio; and c) development of a framework for use in studying Amish and Mennonite produce farmers.

The Practice of Extension

Extension is defined as a series of embedded communicative interventions that are meant, among others, to develop and/or induce innovations which supposedly help to resolve (usually multi-actor) problematic situations (Leeuwis and van den Ban 2004). Extension has both communication and education dimensions. According to Swanson and Claar (1984), the communication dimension implies the process of getting useful information to people whereas the educational dimension refers to the process of helping people to acquire the necessary knowledge, skills and attitudes to effectively use the information acquired. However, this distinction between education and communication is tenuous at best as communication is more than information dissemination. According to Beltran (1998), communication is the acquisition and processing of information to arrive at a well-informed decision (see also Freire, 1987). According to these authors, the goal
of Extension is enabling people to use the skills, knowledge, and information acquired to improve their quality of lives. Extension, therefore, is essentially a communication process.

The practice of extension has, in large part, mirrored the theory of Extension. Everett M. Rogers’ research has been instrumental in establishing Extension Systems in the United States and the rest of the world. His *Diffusion of Innovations* book described the extension worker as a change agent in the service of a change agency which has a goal of inducing change in a client system. In 1971, Rogers & Shoemaker offered an explicit communication model for use by Extension Services, known as the SMCRE model (figure 1).

In the SMCRE communication model, the elements of diffusion are: the source (S) the originator of the innovation (an inventor, scientist, change agent, or opinion leader); the message (M) is the new idea or innovation; channel (C) is the means through which the innovation is distributed; receivers (R) are members of a social system; and effect (E) are changes in knowledge, attitude and overt behavior (adoption or rejection) in regard to the innovation (Rogers & Shoemaker, 1971). The model depicts how messages are passed from the researcher through the extension worker to farmers.
Rogers’ defined communication as “a process by which messages are transferred from a source to one or more receivers” (Rogers & Svenning, 1969, p. 7). He also defined a change agent as “a professional who influences innovation decisions in a direction deemed desirable by the change agency” (Rogers & Svenning, 1969, p. 169).

Applying the SMCRE model to the Land Grant Extension System, the Source of communication became the Land Grant Institution (or Cooperative Extension Service) with a message (agricultural innovations developed at research stations) to be spread through channels, such as extension workers and/or mass media, to receivers (or farmers) for the purpose of causing an effect, adoption or rejection. The model also indicates that farmers are free to reject the message. However, it is obvious that the extension educator, like a salesperson, is intent on causing adoption of messages deemed desirable by the change agency. It is worth pointing out the role of the extension worker, as change agent, he or she is in full compliance with decisions pre-determined by the change agency. The
extension worker is a very important asset to the SMCRE model serving as the conduit for the process to be successful.

Extension systems, the world over, but especially in the developing countries in the mid-1960s, adopted the SMCRE model as a means of increasing food production, eradicating hunger, and improving the overall quality of human lives. However, when efforts to diffuse agricultural innovations in developing countries failed, rather than question the validity of the SMCRE model, Rogers & Svenning (1969) placed the blame squarely on Third World peasants under what they called the subculture of peasantry. According to them, peasants lack empathy, which they defined as the ability to put oneself in another person’s shoes. Lacking empathy, in essence, means that peasants cannot imagine what it is like to be rich.

It was the work of Rogers’ students, such as Neils Roling and Joseph Ascroft in East Africa (Roling, 1971) that showed that the SMCRE model was ineffective in eliciting feedback from the farmers as extension workers were more concerned with giving instructions rather than listening to what farmers had to say. Thus, the main criticism of the SMCRE model is that it is source-biased. The focus is transmission, dissemination, or talking to peasants, rather than interacting, communicating, or talking with them (Moemeka, 2000).

The theoretical perspective guiding this investigation was developed from selected components of Rogers’s traditional diffusion of innovations theory (Rogers, 2003). Rogers defined diffusion as the process by which an innovation is communicated through certain channels over time among members of a social system. An innovation, according to Rogers (2003), is an idea, practice, or object that is perceived as new by an individual
or other unit of adoption. Rogers (2003) identified five categories of adopters (see figure 2): innovators, early adopters, early majority, late majority, and laggards.

![Classification of Innovation Adopters (Rogers, 1971)](image)

This classification highlights the characteristics of potential adopters and how they differ during the diffusion process. Rogers (2003) presented an overview of the main characteristics and values of each adopter category. Innovators are the first individuals to adopt an innovation and are willing to take risks, youngest in age, have the highest social class, have great financial lucidity, very social and have closest contact to scientific sources and interaction with other innovators. Early adopters are individuals with the highest degree of opinion leadership among the other adopter categories and are typically younger in age, have a higher social status, have more financial lucidity, advanced education, and are more socially forward than late adopters (Rogers, 1962). Early majority are individuals who adopt an innovation after a varying degree of time, which is significantly longer than the innovators and early adopters. Early majority tend to be slower in the adoption process, have above average social status, contact with early adopters, and show some opinion leadership. Late majority individuals approach an
innovation with a high degree of skepticism and after the majority of society has adopted the innovation. Late majority are typically skeptical about an innovation, have below average social status, very little financial lucidity, are in contact with others in late majority and early majority and have very little opinion leadership. Laggards are the last to adopt an innovation and show little to no opinion leadership. These individuals typically have an aversion to change-agents and tend to be advanced in age. Laggards typically tend to be focused on traditions, have lowest social status, lowest financial fluidity, oldest of all other adopters, are in contact with only family and close friends and have very little to no opinion leadership.

Not surprisingly, the transfer view of communication, expressed in the 1960s as the dominant communication paradigm, became heavily criticized as a top-down, one-way and linear or a sock-it-to-them model (Agunga, 1997). For example, in the context of agricultural development, Samanta (1990) described the dominant extension communication paradigm as a transfer of technology (TOT) model, the primary emphases of which are research, extension and adoption. The circumstances of the farmer, such as the problem(s) s/he faces, what they pay for the innovation, and his or her ability to master the innovation were deemed unimportant. Instead, the focus was on disseminating whatever innovations are created by research stations, no matter how inappropriate they may be for the recipients. Figure 3 depicts the traditional extension model. The change process, presented by Watts (1984) begins with research (A) generating new knowledge which is transferred to Extension (B) which, in turn, transfers the knowledge to C (farmers). The basic premise of the TOT model is that agricultural research priorities are determined by scientists and funding agencies; scientists then experiment in-laboratory
and on-station to generate new technology; and this is then handed over to Extension for
transfer to farmers (Chambers, 1993). It ignores the actual contribution of farmers and
their potential as generators of technology or knowledge (Javier, 1989).

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According to Chambers and Ghildyal (1984), the normal transfer of technology
model has a built-in bias which favors resource-rich farmers, whose conditions resemble
those of the research stations. It does not involve farmers, especially small-scale or
resource-poor farmers, in identifying their constraints and adapting research to local
conditions (Stoop, 1988). As a critique of his own model, Watts (1984, p. 21) stated:
“Ideally there should be a return flow of research needs from farmers plus some direct
farmer-to-researcher feedback.” Oakley (1988) identified four reasons for the failure of
the technology transfer model in influencing change. These are: a) differences in the
heterogeneity of rural societies; b) the assumption that innovations are relevant to all
members of a social system and thus non-adoption could only be explained in
psychological terms, such as level of education; c) emphasis on the use of progressive
farmers or opinion leaders to influence adoption decisions; and d) a belief that the cause
of poor agricultural performance is technological and can be solved by developing technology and improving delivery.

In short, the dominant communication paradigm or TOT extension model casts the researcher (or Extension service) in the prestigious role of being the source of all new technologies and the farmer as the passive recipient, who is often recalcitrant to change. In reality, however, the evidence is clear that it is the change agency and its extension workers who often fail to listen to putative beneficiaries. It is this top-down approach to extension communication that the participatory extension approach was set up to address (Davies, 1988).

**Homophily and Heterophily in Extension**

Heterophily is defined as the degree to which pairs of individuals who interact are different in certain attributes, such as beliefs, values, education, social status, and the like (Rogers & Shoemaker, 1971). Berlo (1960) and Rogers (2003) note that where two communicants are heterophilous, an improved communication system is needed to help participants better understand one another. The theory of homophily, defined by Lazarsfeld and Merton (1964), is that most human communication will occur between a source and a receiver who are alike (i.e., homophilous and have a common frame of reference). Homophily is the degree to which individuals in dyad are congruent or similar in certain attributes, such as demographic variables, beliefs and values (Touchey, 1974). Thus, heterophily is the opposite of homophily.

It is difficult to obtain accurate data from an extremely traditional respondent because s/he is so heterophilous, in regard to the investigator (Rogers & Shoemaker, 1971). The two seldom share common meanings and beliefs or an effective channel of
discourse. Traditional individuals, whether the rural peasants or the urban poor, share a subculture of tradition whose central elements consist of mutual distrust in interpersonal relations, fatalism, a lack of empathy, and a limited view of the world (Rogers and Svenning, 1969). A subculture contains many elements of the broader culture of which it is a part but has special characteristics not shared by most members of the larger society.

By the mid-1970’s criticism of Rogers’ dominant communication paradigm had become so widespread that he himself presided over its fall in his 1976 article called, “The rise and fall of the dominant paradigm.” However, it is clear that by the late 1960s, Rogers had begun planting the seed for participatory communication, which subsequently replaced his dominant paradigm (Ascroft and Agunga, 1994). Green (1986) defined participation as the degree to which members of an organization are involved in the innovation decision process. Involving the clients in the planning of change increases the likelihood of success for the following reasons (Rogers, 1969): the clients’ unique needs are considered in planning the change program; increases client commitment to decisions; and legitimizes collective innovation decisions.

In the fifth edition of his book, Diffusion of Innovations, Rogers, (2003) has offered a new meaning of communication. He defined communication “as a process by which participants create and share information with one another in order to reach a mutual understanding” (p.5). In essence, communication stresses genuine dialogue or co-equal knowledge sharing over the persuasion or top-down model of old. However, Rogers continues to define the change agent as an “individual who influences clients’ innovation-decisions in a direction deemed desirable by the change agency” (p. 27). This means the change agency still controls the type of change that must occur in the
beneficiaries’ social system. It also means the change agent, rather than being an honest broker, is charged with securing the adoption of agency-selected innovations by targeted clientele regardless of whether this clientele express or even perceive a need for innovations.

Perhaps what is crucial to the success of the emerging participatory extension model is a definition of the change agent. Will he or she continue to be depicted as a purposive agent, with an agenda, overt or covert, or will this person be viewed as an honest broker, facilitating interaction between change agency and beneficiaries without any attempt to influence either party? Grudens-Schuck & Hargrove (2000), while advocating the participatory approach, noted a fine line between helping a group to get themselves organized, and becoming pivotal in the achievement of the group to the point where if the facilitator leaves, the group quits. Good facilitators tend to work themselves out of a job, gradually withdrawing as the group becomes self-reliant in its capacity to manage its own affairs.

The Participatory Extension Approach

The participatory extension approach (PEA) entails efforts that catalyze self-reliance of participants in addition to meeting concrete project goals such as higher crop yield (Bunch, 1995; Uphoff, 1992). Extension has always had a common mission of helping people help themselves (Graham, 1994); therefore the participatory approach seems to be much more appropriate, especially with diverse clientele such as Amish and Mennonites. Community-based extension is where extension workers try to transfer ownership of extension to the community, it is central to PEA. Hagmann, Chuma, Connolly, and Murwira (1998) identified the characteristics of PEA as including: a focus
on strengthening rural people’s problem solving, planning and management abilities; and integration of the social mobilization of communities for planning, and action with rural development, agricultural extension and research, in which innovation is considered as a social process. PEA also includes an equal partnership among farmers, researchers and extension educators who can all learn from each other and contribute their knowledge and skills. PEA also promotes farmers’ capacity to adapt and develop new and appropriate technologies or innovations by encouraging them to learn through experimentation, building on their own knowledge and practices and blending these with new ideas in an action learning mode. PEA recognizes that communities are not homogeneous but consist of various social groups with different and conflicting interests, powers and capabilities. The goal is to achieve equitable and sustainable development through the negotiation of interests among these groups and by providing space for the poor and marginalized in collective decision-making (Hagmann et al., 1998).

The PEA learning cycle and operational framework suggest a holistic and flexible strategy following a step-by-step process in which a variety of extension methodologies and tools are flexibly integrated into each step (Hagmann, et al., 1998), including the elements of participatory technology development (PTD), social development approaches, experiential learning (Kolb, 1984) and training for transformation (Hope and Timmel, 1984). As an example, traditional extension educational field days can be part of the overall Participatory Extension Approach, in isolation, this type of educational program might address the needs of only a few farmers and even be used in a top-down manner but, within the community-based PEA framework, the field days can be more inclusive and effective, as whole social entities are addressed (Hagmann, et al., 1998).
Participatory extension consists of a basket of approaches that involve outside facilitators working closely with local community leaders and farmers to take on more active, participatory roles than in conventional extension. In participatory extension, communities are encouraged to identify their problems, prioritize them, and pursue solutions with support from Extension. Participatory extension aims at strengthening the community’s ability to carry out its own development. The extension system does this by: a) building the capacity of local institutions to plan and manage their own development and b) conducting research and extension using a participatory technology development process that fits the diverse and complex farming systems.

Many types of communication techniques and methods fall under the participatory extension approach. They include rapid rural appraisal, participatory rural appraisal, focus groups, and structured workshops (Chamala & Mortiss, 1990). Rapid rural appraisal is designed to obtain new information and to formulate new hypotheses about rural life and information is more elicited and extracted by outsiders (Chambers, 1994). Participatory rural appraisal is defined as a semi-structured process of learning from, with and by rural people about rural conditions and the information is more shared and owned by local people (Chambers, 1994). Focus groups involve the “explicit use of group interaction to produce data and insights that would be less accessible without the interaction found in a group” (Morgan, 1988, p. 12). Fliegel (1993) pointed out that the participatory approach applies particularly to packages of technologies, that is, a systems view of extension rather than a piecemeal or a bird’s eye view whereby the focus is on individual extension activities rather than viewing the overall extension needs of society.
Participatory Extension Approaches are recommended as part extension programs however in practice are not always being implemented.

**Interpersonal and Group Communication Methods**

According to Seevers et al. (1997) teaching methods used by Extension personnel are classified by the number of people to be contacted and the type of contact. The three types of contacts are: individual, group, and media. Individual contacts are one-on-one in which an Extension educator provides personal consultation to the client. This can include a site visit to a farm, home, or office, a phone call, or a client’s visit to the Extension office (Seevers, et al.). Group contacts occur when an Extension educator teaches people in a group setting, including training meetings, demonstrations, and tours. Media contacts are the use of media sources such as radio, newspaper, television, and exhibits to distribute information and influences large numbers of people (Seevers, et al.).

Extension delivery methods are classified by one of three forms of communication written, verbal, and visual (Seevers, et al., 1997.). Written communication involves the written word, verbal communication depends upon the spoken word and visual communication depends upon eye appeal (Seevers, et al.). According to Seevers et al., visual aids are frequently used to supplement the verbal and written word to build attention, maintain interest, or increase teaching effectiveness. Methods such as demonstrations, meetings, television, and webinars combine visual material and oral presentation.

The use of technology is important to Extension educators and the Extension system and includes information delivery, educational program delivery and problem solving (Seevers, et al., 1997). Depending upon the type of program and the approach
taken by specialists and educators, these three functions may overlap. The relationship of media technologies to these three functions depends upon the audience size and type.

Information delivery flows through many channels of communication from the Extension Service to its clientele and include news articles, meetings or personal consultations (Seevers et al., 1997). Educational programs are prepared and delivered by Extension professionals to upgrade the knowledge, skills, and capabilities of clientele and may involve many different activities or learning experiences which together become a program focused upon special audiences, special needs, and special problems. According to Seevers et al., clients turn to the Extension Service for expertise, knowledge and skills needed to solve individual and group problems arising within their farms, homes, families, and community.

Summary

In this study, it was speculated that Amish and Mennonite produce farmers have different cultural characteristics from mainstream America, which may warrant alternative extension methods. This review of the literature has shown the need for stakeholder involvement in extension program development. The research thesis is that in Amish and Mennonite societies where modern communication technologies are rarely used, effective extension will require more interpersonal contacts and word-of-mouth communication reminiscent to developing countries. The review of literature has defined participatory extension and conditions for its success. The goal was to describe the conditions among Amish and Mennonite produce farmers to determine if alternative extension methods are necessary with this particular clientele.
Chapter 3: Methodology

Research Design Introduction

This methodology chapter describes the type of research, target population, instrumentation, validity, reliability, data collection and statistical procedures used in the study. The study determined the Extension needs and what extension methods should be considered for Amish and Mennonite produce farmers in Ohio.

This study was conducted using a mail survey based on Dillman’s Total Design Method (TDM) (Dillman, 2000). Major concerns of surveys include the validity threat of measurement error and will be explained under the title of validity and reliability. Other threats to validity are selection bias, sampling frame error and non-response error. Selection bias or effect is a statistical bias where error may arise in choosing the individuals or groups in a study (Vogt, 2005) and will be discussed further under survey population section. Sampling frame is the size of the sample as a percentage of the population from which it is drawn (Vogt, 2005). Sampling frame error was controlled through subject selection and will be discussed further under the survey population section. The threat of non-response error will be discussed under data collection procedures.

A mailed questionnaire, found in Appendix B, was used to collect data from respondents providing the basis for findings, conclusions, and recommendations resulting from this study.
Survey Population

The population was Ohio Amish and Mennonite farmers who grew and marketed produce at eight Ohio Department of Agriculture licensed produce auctions in Ohio as of December 2010. In Ohio, all farmers who sell produce at auction need to be registered with the particular auction and all auctions are licensed with the Ohio Department of Agriculture. The databases of Amish and Mennonite farmers who were registered to sell produce at Ohio’s eight produce auctions (n=345) were obtained from the managers of the individual produce auctions, who keep these databases. A sampling frame is a list or other record of the population from which the sampling units are drawn (Vogt, 2005). To control the threat of error existing in the listings, the names of the farmers in the listings were checked by the managers of the produce auctions, who monitor each farmer at their auction, to make sure the lists were accurate, complete and up-to-date.

These databases were merged and then purged to eliminate any duplicate listings, to create a master list (n=345) that comprised the population for this study. A census of the population was conducted in which the entire target population was surveyed. A census has the advantage of providing information on each and every individual of the population.

Several strategies were utilized to control non-response error. Pre-notification has been shown to increase response rates on mailed surveys (Miller & Smith, 1983). A pre-survey postcard (Appendix A) was sent to each person on June 3, 2011 explaining the purpose of the research and informing the recipients that a mail questionnaire would be sent in the mail shortly thereafter. The questionnaire (Appendix B), incentive postcard (Appendix D) and a stamped return envelope were all printed on colored paper, scarlet
and gray, and distributed via the postal mail service. The cover letter was printed on Ohio State University South Center’s letterhead, assuring the respondents that their responses would remain confidential and requested study participants to return completed questionnaires within three weeks (Dillman, 2000; Miller & Smith, 1983).

Motivation to participate in surveys varies widely among respondents and rewards can be civic responsibility, interest in topic, financial reward and interest in expressing their opinion (Dillman, 2000). As an incentive for completing the questionnaire, respondents had an option to receive a free 1-year subscription to a leading horticulture farming newspaper, *Country Folks Grower* (a $22.00 value) by returning an enclosed postcard (Appendix D).

**Instrumentation**

The data collection instrument was developed by the investigator based on the purpose and objectives of this study and on a review of the literature. A mailed questionnaire was used to collect the data needed to address each of the research questions. Development of the questionnaire began by generating a list of the information desired from the target population. The initial list of questions was organized into five different categories. The categories included: extension needs, information sources, interpersonal contact methods, annual contacts and demographic information.

After the items were categorized, questions were developed, reviewed and analyzed using Dillman’s eight criteria for assessing survey questions (Dillman, 2000). The survey questionnaire was developed based on the Tailored Designed Method (TDM) consisting of five elements, which individually have been shown to significantly improve response to mail surveys (Dillman, 2000). These elements include a respondent-friendly
questionnaire, up to five carefully timed contacts with the questionnaire recipient, inclusion of stamped return envelope, personalized correspondence, and an offer to send an executive summary of findings as a token incentive (Dillman, 2000). Tailored Design Method is a set of procedures for conducting successful self-administered surveys that produce both high quality information and high response rates (Dillman, 2000).

The instrument consisted of five sections. Section I asked Amish and Mennonite produce farmers to rate the importance of selected future extension program topics. Section II asked farmers how often they used particular information sources in an average year. Section III asked farmers to indicate the methods they use in communicating with selected organizations or individuals. Section IV asked farmers to indicate how many times in an average year they communicated with selected organizations or individuals. Section V focused on collecting demographic, farm and personal characteristics information regarding Amish and Mennonite produce farmers and their operations. Farmers also were asked to provide specific recommendations on how Ohio State University Extension could better serve them.

The instrument and research proposal were submitted to the OSU Office of Responsible Research Practice (ORRP) Institutional Review Board (IRB), which reviews human subject research proposals to ensure adequate protections are in place before humans participate in research. On May 23, 2011, the IRB determined this study to be exempt under category #2 exemption; Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior (OSU ORRP, 2011), and assigned the Protocol Number 2011E0274 (Appendix E).
Validity and Reliability

Ary, Jacobs, & Razavieh (1996) described validity as the extent to which the instrument measures what the researcher intends to measure. Vogt (2005) defined content validity of a measure as having items which accurately represent the thing being measured, it is not a statistical property; it is a matter of expert judgment. Face validity is a form of validity determined by whether, on the face of it, a measure seems to make sense or is valid (Vogt, 2005). Content and face validity were established through examination of the instrument by a panel of experts (Appendix F). The expert panel consisted of eight University faculty and Extension professionals from North Carolina, Kentucky and Ohio. Members of the expert panel were asked to review the questionnaire for content validity and provide suggestions for improvement. Experts were also asked to assess the appropriateness of each item on the questionnaire as well as to comment on the clarity and wording of each item. This process helped to control measurement error in this study. The researcher made appropriate modifications to the questionnaire based upon input from the panel of experts.

Ary, Jacobs, & Razavieh (1996) defined reliability of an instrument as the degree of consistency with which the instrument measures the object being measured. After face and content validity were established, a pilot test of the instrument was implemented to assess instrument reliability. Fourteen Amish and Mennonite produce farmers from Kentucky, Pennsylvania and Illinois (other than Ohio) were selected for the pilot test. Pilot test respondents did not include members of the panel of experts, nor were they a part of the actual study population. In addition to asking them to complete the questionnaire, these farmers were also asked how long it took them to complete the
survey and if all questions and instructions were clear. The pilot test helped the researcher to determine: a) how long it took recipients to complete the survey, b) ensured that all questions and instructions were clear, and c) allowed the researcher to remove any items which did not yield usable data.

Eight pilot test surveys were returned. One survey was incomplete resulting in data from seven surveys analyzed for reliability analysis. Reliability coefficients measure the extent to which an instrument is repeatable and consistent (Vogt, 2005). Internal consistency was assessed by computing a Cronbach’s alpha coefficient for selected items on the questionnaire. The coefficient alpha was calculated for items in sections I, II, III and IV. Item I had a Cronbach’s alpha of .914, item II had a Cronbach’s alpha of .532, item III had a Cronbach’s alpha of .467 and item IV had a Cronbach’s alpha of .808. A coefficient of 1.0 indicates a perfect correlation; as scores decrease, reliability decreases (Nunnally, 1972). Nunnally also noted that a coefficient of .80 is a commonly used threshold for reliability coefficients, but that coefficients from .50 to .60 may be sufficient in the early stages of research. De Vaus (2004) suggests anything less than .30 is a weak correlation for item-analysis purposes and that item should be removed and not used to form a composite score for the variable in question. Therefore, all items remained unchanged for the final questionnaire. This process, expert review, pilot testing, modification and reliability assessment helped control for measurement error in this study.

**Data Collection**

Data for this study was collected from respondents using a mailed questionnaire (Appendix B) which provided the basis for the findings, conclusions, and
recommendations resulting from this study. Dillman’s (2000) general procedures for mailed questionnaires were followed. The survey research procedure was a self-administered questionnaire that was mailed to the population. Any survey technique that requires the respondent to complete the questionnaire him/herself is referred to as a self-administered survey (Dillman, 2000).

Non-response error refers to the extent to which people fail to provide usable responses and differ from those who do (Miller & Smith, 1983; Linder, Murphy, & Briers, 2001). Several strategies were utilized in this study to control non-response error. Pre-notification has been shown to increase response rates on mailed surveys (Miller & Smith, 1983). A pre-survey postcard (Appendix A) was mailed to each person on June 3, 2011 explaining the purpose of the research and informing the recipients that a mail questionnaire would be mailed out shortly thereafter. The questionnaire (Appendix B), incentive postcard (Appendix D) and a stamped return envelope were all printed on colored paper (scarlet and gray) and distributed via the postal mail service. The questionnaire was printed on Ohio State University South Center’s letterhead and explained how to complete the questionnaire, assuring the respondents that their responses would remain confidential and that only group data would be reported. The questionnaires with instructions were mailed to 345 Amish and Mennonite produce farmers that were registered to sell produce at Ohio produce auctions on June 16, 2011. Study participants were requested to return completed questionnaires by July 11, 2011 (Dillman, 2000; Miller & Smith, 1983). Participants were informed that the survey was coded to assist the researcher in following up with non-respondents. Non-response error refers to the extent to which people fail to provide usable responses and differ from those
who do (Miller & Smith, 1983; Linder, Murphy, & Briers, 2001). Comparing early and late respondents is one method to consider for controlling non-response error (Miller & Smith, 1983; Lindner et al, 2001). Non-response error was assessed by comparing early versus late responses using an independent t-test to compare the responses of early (first half of questionnaires returned) with late (last half of questionnaires returned) respondents on ten variables: how many years been growing produce, number of full time people work on the farm, number of part time people work on the farm, years farming, primary occupation, produce as a % of farm sales, gross farm sales, farm description, farm acreage, and age to see if there were differences among these variables between the early and late responders (Table 1). Based on the finding there was no significant differences between the responses of early and late respondents for the 10 items (P<0.05); therefore, data collected were representative and can be generalized to the entire population.
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Table 1. Comparison of Early and Late Respondents on 10 Survey Items

A reminder postcard (Appendix C) was mailed to all participants on June 30, 2011 asking them to participate and return the questionnaire by July 11, 2011. As of July 11, 2011 only one questionnaire was returned with an invalid address. Of the remaining valid 344 addresses, 150 instruments were returned by the cutoff date of July 11, 2011. The data from the returned surveys was purged resulting in 12 surveys removed. Of these, four were not Amish or Mennonite, one was not a produce farmer, one no longer farmed in Ohio and had moved to Wisconsin and six respondents indicated they did not sell produce at Ohio produce auctions. After purging the respondents, 138 instruments were included in the data analysis, for an overall response rate of 41%. Mail surveys designed using Dillman’s Total Design Method (TDM) yielded response rates of 58 to 92% (Dillman, 2000). However, research on response rates from farmers, as a particular group of interest, reported lower response rates of 12-35% (Pennings, Irwin, & Good,
Similarly, a response rate of 37% was achieved with a sample of small farms in Tennessee (Muhammad, Tegegne, & Ekanem, 2004).

**Data Analysis**

Data collected in this study were coded, entered, and analyzed using IBM SPSS Statistics - v19.0 statistical program (SPSS, 2011), a statistical software program commonly used for analyzing research data (Norusis, 2004). Alpha for all statistical procedures was set a priori. Responses to open ended questions and participants’ written comments were tabulated separately. After all data were entered into SPSS by the researcher, the researcher checked the data for accuracy by visually inspecting the data and running frequency analysis for each item. Descriptive statistics, including frequencies, percentages, means and standard deviations were used to describe the characteristics of the population of Amish and Mennonite produce farmers who grow for licensed Ohio produce auctions to address research question one in this study.

For research question two, determining awareness and participation of Ohio Amish and Mennonite produce farmers, with OSU Extension programs, the percentages of respondents who had benefited from or used any information or assistance provided by Ohio State University Extension in the past were calculated.

Recommendations for future extension programming and delivery were determined by calculating means and standard deviation of various extension topics to respondents. Additionally, response frequency, mean and standard deviation were calculated to determine the respondents’ preferred methods of receiving extension communication, information and assistance. Finally, responses to the open-ended
question regarding specific recommendations how Ohio State University Extension can better serve you were summarized.
Chapter 4: Findings

This study was designed to achieve the following: a) describe the characteristics of Ohio Amish and Mennonite produce farmers and their operations, b) determine awareness of and participation in OSU Extension programs, c) determine the methods of communication used to acquire farming information and d) identify subject matter needs of Amish and Mennonite produce farmers for future Extension programming. Data were derived from a survey of Ohio Amish and Mennonite produce farmers who registered to sell produce at eight Ohio produce auctions licensed with the Ohio Department of Agriculture.

Objective #1: Describe the characteristics of Ohio Amish and Mennonite produce farmers and their operations.

Ohio Amish and Mennonite produce farmers registered to sell produce at Ohio produce auctions as of December 2010 were male (100%). The modal categories for the age of Ohio Amish and Mennonite produce farmers was in the 30-39 age range (29.1%) and 40-49 age range (28.4%). One hundred seven respondents (75.9%) were Amish and 34 (24.1%) were Mennonite. One hundred thirty-one respondents (93.6%) had less than a 12th grade education. Total years in farming ranged from 1-50 years with about half of the respondents having been farming 13 years or less (Table 2).
Employment and Business

Farming is the primary occupation for 82.7% of respondents, spending more than fifty percent (50%) of work hours farming (Table 2). Number of full time employees hired by respondents ranged from 1 to 11 with 38 respondents (27.7%) employing two full time employees. Twenty-seven respondents (19.9%) reported having one part-time employee. Eighty-six respondents (61.4%) expected the size of their produce farm to maintain production whereas 34 or 24.3% planned to expand production in the next five years while 11.4% and 2.9% expected the size of their produce farm to reduce or discontinue production, respectively.

<table>
<thead>
<tr>
<th>Demographic Characteristics by Category, Frequency and Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Total years been farming (min=1, max=50) (n=135)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Gender (n=141)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Age (n=141)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Amish or Mennonite (n=141)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Primary Occupation (n=139)</td>
</tr>
<tr>
<td></td>
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<tr>
<td>Highest level of education (n=141)</td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Table 2. Characteristics of Ohio Amish and Mennonite Produce Farmers by Category, Frequency and Percent
## Table 2, continued

<table>
<thead>
<tr>
<th>Demographic Characteristics by Category, Frequency and Percentage</th>
<th>Response Category</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Farm acreage (n=140)</strong></td>
<td>1 to 20 acres</td>
<td>29</td>
<td>20.7</td>
</tr>
<tr>
<td>(min=2, max=270)</td>
<td>21-50 acres</td>
<td>32</td>
<td>22.9</td>
</tr>
<tr>
<td></td>
<td>51-90 acres</td>
<td>34</td>
<td>24.3</td>
</tr>
<tr>
<td></td>
<td>91-130 acres</td>
<td>29</td>
<td>20.7</td>
</tr>
<tr>
<td></td>
<td>130-160 acres</td>
<td>11</td>
<td>7.8</td>
</tr>
<tr>
<td></td>
<td>161-200 acres</td>
<td>3</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>200 acres +</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td><strong>Change in business (n=140)</strong></td>
<td>Discontinue</td>
<td>4</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>Reduce</td>
<td>16</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>Maintain</td>
<td>86</td>
<td>61.4</td>
</tr>
<tr>
<td></td>
<td>Expand</td>
<td>34</td>
<td>24.3</td>
</tr>
<tr>
<td><strong>Internet use (n=140)</strong></td>
<td>Never</td>
<td>136</td>
<td>97.2</td>
</tr>
<tr>
<td></td>
<td>Seldom/annually</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Occasional/monthly</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td></td>
<td>Frequent/weekly</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Very frequently/daily</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Member of an Ohio farm organization (n=136)</strong></td>
<td>Ohio Produce Growers and Marketers Assn. (OPGMA)</td>
<td>12</td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>Ohio Ecological Food and Farm Association (OEFFA)</td>
<td>8</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>Ohio Farm Bureau Federation (OFBF)</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>115</td>
<td>84.6</td>
</tr>
</tbody>
</table>

**Internet Usage and Association Affiliation**

Ninety-seven percent (97.1%) of the Amish and Mennonite produce farmers do not use the Internet as a source of farming information. Eighty-three percent (83.3%) of respondents do not belong to any farm organization. However, 5.7% reported being
members of the Ohio Ecological Food and Farm Association (OEFFA), and 8.6% are members of the Ohio Produce Growers and Marketers Association (OPGMA).

**Income**

The percent of total gross farm sales attributed to produce sales for 84 (60.9%) of the respondents was 51% or more while 13 farmers (9.4%) reported less than 10% of their gross farm sales was attributed to produce sales (Figure 4).

![Percentage of Gross Farm Sales Attributed to Produce Sales 2010.](image)

Figure 4. Percentage of Gross Farm Sales Attributed to Produce Sales 2010

More than half of the respondents (n=75, 55.6%) reported annual farm gross sales of $10,000 to 49,000. Twenty-one respondents (15.6%) reported annual gross farm sales of $1,000 to $9,999. Twenty-eight respondents (20.7%) reported annual gross farm sales of $50,000 - $99,000 and eight respondents (5.9%) reported sales of $100,000 to $499,000. None of the respondents reported annual gross farm sales greater than
$500,000 (Figure 5). Based on these sales, figures over 90% of Ohio Amish and Mennonite produce farmers would be classified as small farmers using the USDA classification of $250,000 in gross farm sales or less.

Figure 5. Gross Annual Farm Sales of Ohio Amish and Mennonite Produce Farmers 2010

Objective #2: Determine awareness of and participation in Extension programs by Ohio Amish and Mennonite produce farmers.

One-hundred thirty-two respondents (94.3%) were aware of Ohio State University Extension. One-hundred and one respondents (73.6%) personally knew an Ohio State University Extension professional (e.g. Educator or Specialist). Ultimately, one-hundred eighteen (83.7%) respondents had benefited from information or assistance provided by
OSU Extension. Fifty-six percent (56%) of respondents were aware of the Ohio State University South Centers at Piketon.

**Objective #3: Determine the methods of communication used by Ohio Amish and Mennonite produce farmers to acquire farming information.**

Ohio Amish and Mennonite produce farmers use a variety of communication and information sources as shown in Table 3. University bulletins such as the Ohio Vegetable Production Guide and the Midwest Small Fruit and Grape Spray Guide were used 10 or more times in an average year by 52 respondents (40.3%). Newsletters such as the Truck Patch News, OSU Vegnet and the Ohio Fruit ICM newsletter were the second most popular source of information with 48 respondents (36.1%) using this source 10 or more times a year. Newspaper and magazine articles were used by 30 (23.6%) respondents 10 or more times a year for sources of information. Even though in the United States 79% of adults report using the Internet at a workplace, school, home, or other location on at least an occasional basis (Rainie, 2010), Amish and Mennonite produce farmers do not rely on Information and Communication Technologies as information sources. Internet, web sites and webinars were not used by 125 (97.7%) of respondents. One-hundred twenty-seven (99.2%) farmers indicated they never used social media such as Facebook, blog or Twitter as information sources. One-hundred percent (100%) of respondents indicated they never used television or the radio as information sources. Office visits and farm visits were used by respondents for sources of information 1 to 3 times a year by 41 respondents (32%) and 72 (55.4%) of respondents respectively. Seventy-four respondents (56.5%) indicated they used field days and field demonstrations as sources of information 1 to 3 times a year as information sources. Respectively, 102 (81%) and 113 (89.7%)
Amish and Mennonite produce farmers never used county or state workshops as information sources.

<table>
<thead>
<tr>
<th>Source of Information</th>
<th>Frequency of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
</tr>
<tr>
<td>Bulletins (n=129)</td>
<td>25</td>
</tr>
<tr>
<td>Newsletters (n=133)</td>
<td>26</td>
</tr>
<tr>
<td>Newspaper/Magazine articles (n=127)</td>
<td>23</td>
</tr>
<tr>
<td>Farm/home/field visits (n=130)</td>
<td>24</td>
</tr>
<tr>
<td>Field days/demonstrations (n=131)</td>
<td>48</td>
</tr>
<tr>
<td>Television (n=128)</td>
<td>128</td>
</tr>
<tr>
<td>Radio programs (n=128)</td>
<td>128</td>
</tr>
<tr>
<td>Office visit (n=128)</td>
<td>84</td>
</tr>
<tr>
<td>County workshop (n=126)</td>
<td>102</td>
</tr>
<tr>
<td>State workshop (n=126)</td>
<td>113</td>
</tr>
<tr>
<td>Internet/web sites/webinar (n=128)</td>
<td>125</td>
</tr>
<tr>
<td>Social media (n=128)</td>
<td>127</td>
</tr>
</tbody>
</table>

Table 3. Sources of Information Used by Ohio Amish and Mennonite Produce Farmers

Respondents were asked to check all the methods they use in communicating with selected organizations or individuals as shown in Table 4. Response frequencies were coded: phone, e-mail, U.S. mail, face-to-face or do not communicate with. Frequencies were calculated. Respondents indicated that email is not a contact method used by them.
for communicating with any organizations or individuals. Face-to-face communication was reported to be the most used method of communicating with other farmers within the community by 135 (95.7%) of respondents. Eighty (56.7%) respondents indicated they communicated with farmers outside of their community but who still lived in Ohio via face-to-face communication. U.S. mail was the contact method used by 56 (39.7%) Amish and Mennonite produce farmers to communicate with farmers who reside outside of Ohio. Seventy-eight (54.6%) respondents indicated they use face-to-face communication whereas 53 (37.6%) respondents indicated they used the telephone to communicate with Extension professionals within their county, respectively. The communication method used by 47.5% of respondents to communicate with seed company representatives was via U.S. mail, whereas 42.6% of respondents communicated with seed company representatives face-to-face. Forty-eight percent (48%) of respondents communicate with their chemical company representatives face-to-face. Sixty-eight percent (68%) of respondents indicate they communicate with their fertilizer company representatives using face-to-face communication method. The majority of respondents indicated they do not communicate with other farm organizations (69.5%), out of state Extension professionals (72.3%), or government agencies (65.2%).
<table>
<thead>
<tr>
<th>Source of Information</th>
<th>Phone</th>
<th>E-mail</th>
<th>US Mail</th>
<th>Face-to-Face</th>
<th>Do not communicate with</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers in my community and/or neighborhood (n=139)</td>
<td>18</td>
<td>1</td>
<td>26</td>
<td>135</td>
<td>0</td>
</tr>
<tr>
<td>Farmers outside of my community and/or neighborhood but in Ohio (n=136)</td>
<td>30</td>
<td>1</td>
<td>63</td>
<td>80</td>
<td>9</td>
</tr>
<tr>
<td>Farmers who reside outside of Ohio (n=132)</td>
<td>32</td>
<td>1</td>
<td>56</td>
<td>38</td>
<td>31</td>
</tr>
<tr>
<td>Other farm organizations (e.g. Ohio Farm Bureau) (n=128)</td>
<td>6</td>
<td>1</td>
<td>12</td>
<td>12</td>
<td>98</td>
</tr>
<tr>
<td>Extension professionals in my county (n=134)</td>
<td>53</td>
<td>2</td>
<td>30</td>
<td>78</td>
<td>22</td>
</tr>
</tbody>
</table>

Table 4. Methods of Communicating with Individuals and Organizations
<table>
<thead>
<tr>
<th>Group</th>
<th>Phone</th>
<th>E-mail</th>
<th>US Mail</th>
<th>Face-to-Face</th>
<th>Do not communicate with</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension professionals outside my county</td>
<td>29</td>
<td>1</td>
<td>15</td>
<td>33</td>
<td>61</td>
</tr>
<tr>
<td>(n=127)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extension professionals not from Ohio State</td>
<td>6</td>
<td>0</td>
<td>7</td>
<td>10</td>
<td>102</td>
</tr>
<tr>
<td>(n=126)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government agencies (e.g. USDA, Soil</td>
<td>9</td>
<td>0</td>
<td>17</td>
<td>14</td>
<td>92</td>
</tr>
<tr>
<td>Conservation Service) (n=127)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seed company representatives (n=137)</td>
<td>45</td>
<td>2</td>
<td>67</td>
<td>60</td>
<td>10</td>
</tr>
<tr>
<td>Chemical company representatives (n=132)</td>
<td>38</td>
<td>2</td>
<td>30</td>
<td>69</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4, continued

<table>
<thead>
<tr>
<th>Private consultants (n=129)</th>
<th>Phone</th>
<th>E-mail</th>
<th>US Mail</th>
<th>Face-to-Face</th>
<th>Do not communicate with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24</td>
<td>0</td>
<td>13</td>
<td>46</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>105</td>
<td>129</td>
<td>116</td>
<td>83</td>
<td>61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fertilizer company representatives (n=136)</th>
<th>Phone</th>
<th>E-mail</th>
<th>US Mail</th>
<th>Face-to-Face</th>
<th>Do not communicate with</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40</td>
<td>0</td>
<td>43</td>
<td>96</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>96</td>
<td>136</td>
<td>93</td>
<td>40</td>
<td>122</td>
</tr>
</tbody>
</table>

Objective #4: Identify subject matter needs of Amish and Mennonite produce farmers for future Extension programming.

Respondents were asked to rate the importance of a variety of topics related to produce farming to help identify priorities for future OSU Extension programming. Each topic was ranked on its importance by checking; none, little, moderate, and great. Means and standard deviations were calculated for each topic and then ranked accordingly (Table 5). Disease management (M=2.63, SD=0.55), insect management (M=2.58, SD=0.56) and soil fertility (M=2.49, SD=.71) ranked as the top three topics in terms of importance with means indicating moderate to great importance. Grape variety testing ranked lowest (M=0.60, SD=0.81) with no or little importance. Other extension needs listed as moderate to great importance for 50% or more of respondents included vegetable variety testing, soil conservation, crop nutrition, weed management, produce
marketing, irrigation techniques, farm financial management, greenhouse production, and food safety.
<table>
<thead>
<tr>
<th>Topic</th>
<th>None</th>
<th>Little</th>
<th>Moderate</th>
<th>Great</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Rank</th>
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</thead>
<tbody>
<tr>
<td>Disease management (n=132)</td>
<td>0</td>
<td>5</td>
<td>39</td>
<td>88</td>
<td>2.63</td>
<td>.55</td>
<td>1</td>
</tr>
<tr>
<td>Insect management (n=132)</td>
<td>0</td>
<td>5</td>
<td>45</td>
<td>82</td>
<td>2.58</td>
<td>.56</td>
<td>2</td>
</tr>
<tr>
<td>Soil fertility (n=134)</td>
<td>2</td>
<td>11</td>
<td>40</td>
<td>81</td>
<td>2.49</td>
<td>.71</td>
<td>3</td>
</tr>
<tr>
<td>Crop nutrition (n=133)</td>
<td>6</td>
<td>10</td>
<td>38</td>
<td>79</td>
<td>2.43</td>
<td>.81</td>
<td>4</td>
</tr>
<tr>
<td>Produce marketing (n=132)</td>
<td>4</td>
<td>14</td>
<td>54</td>
<td>60</td>
<td>2.29</td>
<td>.77</td>
<td>5</td>
</tr>
<tr>
<td>Weed management (n=131)</td>
<td>1</td>
<td>19</td>
<td>57</td>
<td>54</td>
<td>2.25</td>
<td>.72</td>
<td>6</td>
</tr>
<tr>
<td>Food safety regulations (n=129)</td>
<td>3</td>
<td>27</td>
<td>45</td>
<td>54</td>
<td>2.16</td>
<td>.83</td>
<td>7</td>
</tr>
<tr>
<td>Soil Conservation (n=129)</td>
<td>8</td>
<td>30</td>
<td>50</td>
<td>41</td>
<td>1.96</td>
<td>.89</td>
<td>8</td>
</tr>
<tr>
<td>Irrigation techniques (n=128)</td>
<td>12</td>
<td>35</td>
<td>41</td>
<td>40</td>
<td>1.85</td>
<td>.97</td>
<td>9</td>
</tr>
<tr>
<td>Greenhouse production (n=130)</td>
<td>25</td>
<td>22</td>
<td>41</td>
<td>42</td>
<td>1.77</td>
<td>1.10</td>
<td>10</td>
</tr>
<tr>
<td>Vegetable variety testing (n=130)</td>
<td>21</td>
<td>27</td>
<td>53</td>
<td>29</td>
<td>1.69</td>
<td>.99</td>
<td>11</td>
</tr>
<tr>
<td>Farm financial management (n=126)</td>
<td>29</td>
<td>32</td>
<td>40</td>
<td>25</td>
<td>1.48</td>
<td>1.05</td>
<td>12</td>
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<tr>
<td>Organic crop production (n=130)</td>
<td>34</td>
<td>39</td>
<td>32</td>
<td>25</td>
<td>1.37</td>
<td>1.07</td>
<td>13</td>
</tr>
<tr>
<td>High tunnel production(n=129)</td>
<td>54</td>
<td>13</td>
<td>23</td>
<td>39</td>
<td>1.36</td>
<td>1.29</td>
<td>14</td>
</tr>
</tbody>
</table>

Table 5. Extension Needs as Ranked by Ohio Amish and Mennonite Produce Farmers
Specific recommendations how Ohio State University Extension can better serve you

Respondents were asked via an open-ended question how Ohio State University Extension can better serve them. Forty-two respondents provided sixty-nine comments, which were organized into the following themes: Extension suggestion (n=30), research suggestion (n=5), food safety regulations (n=7), pesticide regulations (n=2) or an opinion offered by the respondent (n=25), and are summarized below.

Extension suggestions included a more consistent awareness of upcoming educational programs including more local programming to help with the identification and control measures of specific diseases and insects in produce crops. It was suggested to conduct “Amish friendly”, without the use of electronic video or computer devices, hands on workshops and field walks held earlier in the day. Educational topics of interest included soil conservation, soil fertility, small fruit production, food safety, pest control,
weed control, marketing and promotion of local produce, CSA marketing, hot house and high tunnel tomato production and field research updates.

There was an overall request for implementation of Integrated Pest Management (IPM) scouting programs in production areas to help farmers identify and control pest and disease problems, and they showed a willingness to pay for this service. It was also suggested that a telephone number be established so growers can call in to get updated information on disease and insect outbreaks. It was suggested that farmers be updated on upcoming educational programs, crop disease and insect outbreaks, growing tips and crop management through use of frequent non-electronic newsletters mailed directly to farmers, especially during the growing season.

Future research programming suggestions include organic produce and cropping systems, breeding of open pollinated heirloom varieties of produce to enhance genetic strains, research on marketing organic vegetables and ongoing research on disease and insect control methods. Food safety suggestions provided by respondents included that OSU Extension conduct more food safety farm walks in Amish communities to generate food safety interest. Respondents stated concerns that due to them using horses to farm, future food safety regulations could become hard for them to abide by and possibly put them out of business. Pesticide regulation suggestions included providing help and education with getting spray applicator licenses and setting up pesticide disposal programs in their county.

General opinions presented by respondents included an overall appreciation and thanks to OSU Extension, individual Extension professionals for their past and current overall efforts, service and assistance in supporting Ohio Amish and Mennonite produce
farmers and communities. They indicated OSU’s voice is respected by lawmakers, and if OSU Extension listens to the concerns of Ohio Amish and Mennonite produce farmers that will be much appreciated.
Chapter 5: Conclusions, Recommendations and Summary

This chapter presents discussion, conclusions, recommendations and summary regarding this study.

Discussion

The overall purpose of this study was to determine what extension methods are best suited for Amish and Mennonite produce farmers in Ohio as revealed through a survey of Amish and Mennonite produce farmers. To accomplish this purpose, data from Ohio Amish and Mennonite produce farmers registered to sell produce at Ohio produce auctions was collected via mail survey.

Cooperative Extension has a one-hundred year history of working within the national system of land-grant universities to assist in the growth of agriculture industries. This model of research, Extension, and industry has been successfully used to enhance the production capacity of many agricultural industries. Produce farming for local marketing is one of the latest agricultural enterprises to directly benefit from this system.

The changing world demands increased accountability from Extension programs and it has become necessary to carefully assess what Extension does and how it does it. To become more efficient with fewer resources, it is important that OSU Extension look at the multiple dimensions of Extension programming and make changes to improve efficiency and effectiveness. In order to enhance products and services, it is necessary to understand clientele, understand how they perceive their interaction with OSU Extension, and determine what kind of Extension needs they have, the best way to communicate
with them and how they prefer to receive information. More effective programs can be planned based on this information. The more Extension personnel know about their audience, the better able they are to develop relevant programs.

**Conclusions for Objective 1: Describe the characteristics of Ohio Amish and Mennonite produce farmers.**

A profile of the typical Ohio Amish and Mennonite produce farmer reflects a white male age 30 to 40 with less than a twelfth grade education and farming is his primary occupation. Findings from this study are reflective of the relative infancy of Ohio Amish and Mennonite produce farmers and that Extension has a great opportunity to educate and assist these farmers. While these farmers appeared to be new to produce farming, they did seem to be satisfied with over 80% planning to maintain or expand the size of their produce farms in the future, implying they are profiting from growing produce since growing produce is the predominant income source for them. Since these farmers are fairly new to farming and produce growing, providing introductory educational production information will be an important component to Extension programs to assist these farmers with expansion of their businesses into the future. These farmers will continue to be clientele of Extension as long as the information provided remains relevant to their operations.

Since Amish and Mennonite produce farmers are not involved in other Ohio farm organizations or government organizations, Extension is the main agency where they get most of their farming information. Extension can help with connecting Amish and Mennonite produce farmers with existing farm organizations or assist with the formation of a produce auction growers organization since these farmers already have common
interests and affiliations with these markets. Farmers in turn may enjoy enhanced interaction with other produce auction farmers and more information could be shared. Further investigation into the reasons why Ohio Amish and Mennonite produce farmers are not involved in other Ohio farm organizations could provide additional insight about this issue.

**Conclusions for Objective 2: Determine awareness of and participation in Extension programs by Ohio Amish and Mennonite produce farmers.**

A majority (94.3%) of Amish and Mennonite farmers were aware of OSU Extension and had used or benefited from products and services it provides. A high participation rate would seem to indicate that OSU Extension is providing quality, convenient programs that appeal to respondents need for self-improvement. It also suggests that the benefit to participants of obtaining information from OSU Extension must be worth the cost, since participation is voluntary. The fact that 41.8% of Ohio Amish and Mennonite produce farmers were unaware of OSU South Centers combined with the 94.3% that knew about OSU Extension suggests the need to develop a new approach or public relations strategy so that these farmers may be aware of the programs offered by the OSU South Centers. This study did not attempt to determine the underlying reason for this observation however the geographic, southern Ohio, location of the South Centers at Piketon may contribute to this and would be an interesting question for further research.
Conclusions for Objective 3: Determine the methods of communication used by Ohio Amish and Mennonite produce farmers.

Interpersonal contact methods are most used by Ohio Amish and Mennonite produce farmers. These are services where the format typically provides producers with more personalized, individual attention, and enables unique situations to be more directly addressed. This also enables producers to get their specific questions answered and may increase the likelihood of producers to apply new knowledge. These findings indicate there are opportunities for multi-state Extension professionals to collaborate development of Extension programs that would benefit the Amish and Mennonite farmers throughout these areas.

Ohio Amish and Mennonite produce farmers obtain information from a variety of sources. The top five information sources used more than once per year include Extension bulletins, newsletters, newspaper or magazine articles, farm/home/field visits and field days/demonstrations. These should be information sources of choice used by Extension professionals working with Amish and Mennonite farmers. Based on the findings of this study, it appears that Extension is considered a trusted source of information for these farmers. Therefore, the communication and Extension methods of choice would be more interpersonal with more one-on-one communication methods used. Only 2.8% of Ohio Amish and Mennonite produce farmers report seldom or occasionally using the Internet as a resource for produce farming information with 97.1% never using the Internet. Therefore the use of ICTs and electronic media for teaching, communicating or sharing information would not be used by these farmers and alternative Extension methods need to be considered.
Conclusions for Objective 4: Identify subject matter needs for future Extension programming.

Extension needs that were rated most highly by Ohio Amish and Mennonite produce farmers were focused on production issues. Disease management, insect management, and soil fertility ranked as the top three topics in terms of importance to Ohio Amish and Mennonite produce farmers. This observation indicates that many Amish and Mennonite produce farmers still need basic production information. Since 26% of Ohio Amish and Mennonite produce farmers have been engaged in farming ten years or less, this should not be too surprising. This is an opportunity for Extension to educate farmers and provide needed information to help out these less experienced farmers.

Ohio Amish and Mennonite produce farmers prefer to receive information through traditional information transfer methods; Extension bulletins, newsletters, newspaper/magazine articles and farm visits. Workshops are never a source of information used by eighty-one percent of Amish and Mennonite produce farmers. Newer electronic technology, such as webinars, blogs, Skype, social media, Internet/web sites/webinar, email, television and radio programs were ranked as never used information sources. Extension capitalizes on electronic media as an inexpensive and effective means of transferring information; however, it appears that Amish and Mennonite produce farmers are not yet equipped for the electronic communication age and will not benefit from these Extension methods.

Ohio Amish and Mennonite produce farmers had their own ideas of what they would like to see OSU Extension do for them. These recommendations will give
Extension professionals program ideas when developing project funding proposals and when planning future programs of work. Information on topics of importance to Ohio Amish and Mennonite produce farmers should be used to guide the development of future OSU Extension programs and services. These are obviously pressing issues that are impacting Ohio Amish and Mennonite produce farmers. Extension programs designed to target these issues should be planned to address those concerns in the near future.

**Summary of Recommendations**

Evaluation processes often result in suggestions for change in the organization (Minnett, 1999), therefore this study would not be complete without discussing some specific recommendations for change.

The intended purpose of this research was to assess the extension needs of Amish and Mennonite produce farmers that grow for Ohio produce auctions. A multiple-output strategy concentrating on interpersonal one-on-one communication activities should be continued. The high percentage of Amish and Mennonite farmers that are aware of or have benefited from OSU Extension shows that Extension has had an impact on these farmers. The use of Extension services by these farmers will continue as long as Extension professionals provide relevant information using communication methods conducive to the culture and lifestyles of the Amish and Mennonites and provide information and service that meet the needs of the farmers. Data from this study should be used to guide the development of new Extension programs designed to address information needs identified by Ohio Amish and Mennonite produce farmers.
The process of continual evaluation needs to be built into Extension programs and activities being conducted from beginning to end. Clientele needs and delivery preferences change over time, especially with advances in technology. Using the results of this survey as baseline data for a longitudinal study, which also could collect impact data from Amish and Mennonite produce farmers, would enable researchers to track changes in clientele and their information preferences over time and could provide important impact documentation for OSU Extension. Impact documentation that could be gathered includes knowledge gained by participating in Extension programs, how farmers are applying Extension information and if the use of Extension has improved their income. Documentation of program impacts will likely influence sustainability of OSU Extension into the future.
References


Gemuse Verkaufhause, (2003), Schlabach Printers, Sugarcreek, Ohio.


Javier, E.Q. (1989). Recent approaches in the study and management of the linkages between agricultural research and extension. *ISNAR Staff Notes, No. 89-63*.


Ohio State University Extension Communique (2010), Retrieved December, 20 2010 from:http://videos.sorensonmedia.com/Ohio+State+University/VideoCommuniqueDec2010/9402fe41A965er408fjbd0a8639b70bc3735


Weaver, F. *Personal communication with Fred Weaver / Interviewer: Brad Bergefurd*. Mennonite farmer in Rainsboro, Ohio, November 15, 2010.


Yoder, V. *Personal communication with Vern Yoder/Interviewer Brad Bergefurd*. Amish farmer in Winchester, Ohio, November 2010.


Appendix A: Pre-survey Postcard
Dear Produce Auction Farmer,

A few days from now you will receive in the mail a request to fill out a brief questionnaire on how The Ohio State University (OSU) can help you with your produce farming business.

Your input is important and will help OSU understand your needs. This will allow us to plan fruit and vegetable Extension programs to help you be a more successful produce grower. It should only take 10 minutes or less to check the answers that apply to your produce farm.

Thanks for your time. If you have questions or concerns, please do not hesitate to call me.

Sincerely,

Brad Bergefurd
Brad Bergefurd, Horticulture Specialist

P.S. You will be offered a small token of appreciation with the questionnaire as a way of saying thanks.
Appendix B: Questionnaire
Purpose

Ohio State University Extension is to provide education services for farmers in Ohio, including Amish and Mennonite farmers. This survey will assess the appropriateness of extension methods used to deliver information to Amish and Mennonite farmers who grow for Ohio produce auctions. This study will be helpful in planning future Extension programs. Please complete this survey and return it by postal mail in the enclosed stamped and addressed envelope no later than July 11, 2011.

All information will remain strictly confidential.

Your input will be reported only in summary form so that information from individual respondents cannot be identified.

For questions or assistance contact:
Brad BERGEFURD, bergefurd.1@osu.edu
OSU South Centers
1864 Shyville, Rd.
Piketon, OH 45661
(Tel. 740-289-2071 x136 or 740-253-0998)
*For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact Ms. Sandra Meadows in the Office of Responsible Research Practices at 1-800-678-6251.
**Section I: Extension Needs.**
Please rate the importance of the following topics for the success of your produce farming business.
(Please check one answer for each topic)

<table>
<thead>
<tr>
<th>Topic</th>
<th>None</th>
<th>Little</th>
<th>Moderate</th>
<th>Great</th>
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</thead>
<tbody>
<tr>
<td>Vegetable variety testing</td>
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<tr>
<td>Berry variety testing</td>
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<tr>
<td>Grape variety testing</td>
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<tr>
<td>Tree fruit variety testing</td>
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<tr>
<td>Soil conservation</td>
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<tr>
<td>Crop nutrition</td>
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<tr>
<td>Insect management</td>
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<tr>
<td>Disease management</td>
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<td>Weed management</td>
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<td>Produce marketing</td>
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<td>Soil fertility</td>
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<td>Irrigation techniques</td>
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<td>Organic crop production</td>
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<td>Food safety regulations</td>
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<td>Farm financial management</td>
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<td>Business planning</td>
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<td>Greenhouse production</td>
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<td>High tunnel production</td>
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<td>Labor management</td>
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<td>Other specify: _____________</td>
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</table>
## Section II: Information Sources

Please indicate, in an average year, how often you use these information sources. (Check only one box for each source)

<table>
<thead>
<tr>
<th>Information source</th>
<th>Never</th>
<th>1-3 times a year</th>
<th>4-6 times a year</th>
<th>7-9 times a year</th>
<th>10+ times a year</th>
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<tbody>
<tr>
<td>Bulletins (e.g. Ohio Vegetable Production Guide, Midwest Small Fruit and Grape Spray Guide, etc.)</td>
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<tr>
<td>Newsletters (e.g. Truck Patch News, Vegnet, Ohio Fruit ICM Newsletter, etc.)</td>
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<tr>
<td>Newspaper/Magazine articles</td>
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<tr>
<td>Internet/Web sites/Webinar</td>
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<tr>
<td>Social Media (e.g. Facebook, Blog, Twitter, etc.)</td>
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<tr>
<td>Television</td>
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<td>Radio programs</td>
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<td>Office visits</td>
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<tr>
<td>Farm/home/field visits</td>
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<tr>
<td>Skype</td>
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<td>Field days/demonstrations</td>
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<td>County workshop</td>
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<td>Other Specify:</td>
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Specify: ____________________
## Section III: Interpersonal Contact Methods.

Please indicate the methods you use in communicating with the following organizations/individuals. (Check all the boxes that apply)

<table>
<thead>
<tr>
<th>Organization/Individual</th>
<th>Phone</th>
<th>E-mail</th>
<th>U.S. Mail</th>
<th>Face to Face</th>
<th>Do not communicate with</th>
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<tbody>
<tr>
<td>Farmers in my community and/or neighborhood</td>
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<td>Farmers outside of my community and/or neighborhood but in Ohio</td>
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<tr>
<td>Farmers who reside outside of Ohio</td>
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<td>Other farm organizations (e.g. Ohio Farm Bureau)</td>
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<td>Extension professionals in my county</td>
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<td>Extension professionals outside my county</td>
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<td>Extension professionals not from Ohio State</td>
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<td>Government agencies (e.g. USDA, Soil Conservation Service)</td>
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<td>Seed company representatives</td>
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<td>Chemical company representatives</td>
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<td>Fertilizer company representatives</td>
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<tr>
<td>Private consultants (e.g. Certified Crop Advisors)</td>
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Section IV: Annual Contacts.

Please indicate, in an average year, how many times you communicate with the following organizations/individuals. (Check only one box per organization/individual)

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<thead>
<tr>
<th>Organization/Individual</th>
<th>Never</th>
<th>1-3 times a year</th>
<th>4-6 times a year</th>
<th>7-9 times a year</th>
<th>10+ times a year</th>
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<tbody>
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<td>Farmers in my community and/or neighborhood</td>
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<tr>
<td>Farmers outside of my community and/or neighborhood but in Ohio</td>
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<td>Farmers who reside outside of Ohio</td>
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<td>Other farm organizations (e.g. Ohio Farm Bureau)</td>
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<td>Extension professionals in my county</td>
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<td>Extension professionals outside my county</td>
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<td>Extension professionals not from Ohio State</td>
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<td>Government agencies (e.g. USDA, Soil Conservation Service)</td>
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<td>Seed company representatives</td>
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<td>Chemical company representatives</td>
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<td>Fertilizer company representatives</td>
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<tr>
<td>Private consultants (e.g. Certified Crop Advisors)</td>
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<td>Other specify:__________________</td>
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</table>

Section V: General Information.

1. How frequently do you use the Internet as a resource for produce farming information? (check one)
   - □ Never
   - □ Seldom/annually
   - □ Occasional/monthly
   - □ Frequent/weekly
   - □ Very Frequent/daily

2. Are you aware of Ohio State University Extension? (check one)
   - □ Yes
   - □ No

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3. Do you know an Ohio State University Extension professional (e.g. Educator, Specialist)? (check one)
   □ Yes  □ No

4. Are you aware of The Ohio State University South Centers at Piketon? (check one)
   □ Yes  □ No

5. Have you benefited from or used any information/assistance provided by Ohio State University Extension in the past? (check one)
   □ Yes  □ No

6. How many years have you been farming? ____ year(s)

7. How many years have you grown produce? ____ year(s)

8. What is the acreage of your farm? _____ acre(s)

9. How many people (including you) currently work on your produce farm?
   _____ # full time  _____ # part time

10. Is farming your primary occupation, do you spend more than 50% of your work hours farming? (check one)
    □ Yes  □ No

11. Do you sell produce at an Ohio produce auction? (check one)
    □ Yes  □ No

12. What was your farm’s annual gross sales in 2010. (check one)
    □ $999 or less
    □ $1000-$9,999
    □ $10,000-$49,999
    □ $50,000-$99,999
    □ $100,000 – $499,999
    □ $500,000 or more.

13. What percentage of your farm’s gross sales is generated from produce sales? (check one)
    □ 10% or less
    □ 11% to 20%
    □ 21% to 30%
    □ 31% to 40%
☐ 41% to 50%
☐ 51% or more.

14. How would you describe your farming operation? 
   (check one)
   ☐ Conventional
   ☐ Organic
   ☐ Organic and conventional practices
   ☐ Certified organic

15. If certified organic, what year did you become certified?
   ________ year

16. Over the next five years, how do you expect the size of your produce farm to change? (check one)
   ☐ Discontinue production
   ☐ Reduce production
   ☐ Maintain production
   ☐ Expand production

17. Are you: (check one)
   ☐ Male
   ☐ Female

18. I am: (check one)
   ☐ Amish
   ☐ Mennonite
   ☐ None of the above

19. My age as of December-31-2010 is: (check one)
   ☐ 19 or under
   ☐ 20 to 29
   ☐ 30 to 39
   ☐ 40 to 49
   ☐ 50 to 59
   ☐ 60 or older

20. What is your highest level of formal education? 
   (check one)
   ☐ No formal education
   ☐ Less than 12th grade
   ☐ High school graduate/GED
   ☐ Some college/vocational/technical school
   ☐ Bachelor degree or higher
21. Check which farm organization(s) in Ohio you are a member: (Check all that apply)?

☐ Ohio Produce Growers and Marketers Association (OPGMA)
☐ Ohio Farm Bureau Federation (OFBF)
☐ Ohio Farmers Union (OFU)
☐ Ohio Ecological Food and Farm Association (OEFFA)
☐ Innovative Farmers of Ohio (IFO)
☐ Other specify: ____________________________
☐ None at all

22. Any specific recommendations how Ohio State University Extension can better serve you?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Thank You!

Please return this survey in the prepaid envelope as soon as possible and no later than July 11, 2011.

Do not forget to include the postcard to reserve your FREE subscription to Country Folks Grower.

Thank you for participating in this survey. Your cooperation is greatly appreciated and will support the growth and development of the produce auction industry in Ohio.
Appendix C: Reminder Postcard
We need your help!

Recently, you received a survey asking your input to help The Ohio State University identify ways to assist produce auctions. This information will be used to plan programs to ensure the success and future growth of Ohio’s Produce Auctions.

If you have returned your survey, please accept my thanks for your participation. If you have not yet submitted your response, please do so by July 11. Your input is critical to this research project.

If you did not receive a survey, or cannot find the original mailing, please contact Julie Moose at OSU South Centers at 1-800-297-2072 (Ohio only) ext. 223. Thank you!

Brad Bergefurk
Horticulture Specialist
OSU South Centers
Appendix D: Incentive Postcard
Country Folks
GROWER
Country Folks Grower is Published Monthly By Lee Publications
P.O. Box 121, Palatine Bridge, NY 13428

Name ____________________________________________
Business/Farm Name ____________________________________________
Address ____________________________________________
City __________________________ State ______ Zip __________
PHONE ( ) __________________ Fax ( ) __________________
E-mail ____________________________________________
Signature ____________________________________________ Date __________

Can we use your fax or e-mail to contact you about your subscription? yes  no

☐ NEW  ☐ RENEW

1 Year Subscription a $22 Value
NO CHARGE as a part of the OSU Survey

To receive this free subscription, you must fill out the questionnaire below. All information is confidential.

Title  ☐ Owner/President  ☐ Manager/Supervisor  ☐ Employee  ☐ Buyer

A. Do you grow vegetables? Acres: ☐ 1-3  ☐ 3-10  ☐ Over 10
☐ Beets  ☐ Onions  ☐ Tomatoes  ☐ Broccoli
☐ Cabbage  ☐ Celery  ☐ Cauliflower  ☐ Pumpkins
☐ Beans  ☐ Potatoes  ☐ Sweet Corn  ☐ Cucumbers
B. Do you grow fruit? Acres: ☐ 1-3  ☐ 3-10  ☐ Over 10
☐ Grapes  ☐ Cherries  ☐ Strawberries  ☐ Peaches
☐ Apples  ☐ Pears  ☐ Cranberries  ☐ Blueberries
☐ Melons  ☐ Brambles
C. Do you operate a greenhouse?
☐ Sq. Ft.  ☐ Up to 5,000  ☐ 5-10,000  ☐ over 10,000
☐ Bedding Plants  ☐ Vegetables  ☐ Foliage Plants
☐ Cut Flowers  ☐ Potted Flower Plants  ☐ Other
D. Do you operate a nursery? Acres: ☐ 1-3  ☐ 3-10  ☐ Over 10
☐ Wholesale  ☐ Retail  ☐ Christmas Trees
☐ Shade Trees  ☐ Fruit Trees  ☐ Mums
☐ Shrubs  ☐ Perennials  ☐ Herbs, Drieds, Cuts
E. Other Crops
F. Is there any aspect of horticulture that you would like to see more of in Country Folks Grower.

MAIL TO P.O. BOX 121, PALATINE BRIDGE, NY 13428 or FAX 518-673-2381
Appendix E: Exemption from Office of Responsible Research
May 23, 2011

Protocol Number: 2011E8174
Protocol Title: ASSESSMENT OF EXTENSION METHODS FOR OHIO AMISH AND MENNONITE FARMERS, ROBERT AGUNGA, BRAD BERGFFURD, HUMAN & COMMUNITY RESOURCE DEVELOPMENT
Type of Review: Request for Exempt Determination

Dear Dr. Agunga,

The Office of Responsible Research Practices has determined that the above referenced protocol exempt from IRB review.

Date of Exempt Determination: 6/9/2011
Qualifying Exemption Category: 2

Please note the following:

- Only OSU employees and students who have completed CITI training and are named on the signature page of the application are approved as OSU Investigators in conducting this study.
- No changes may be made in exempt research (e.g., personnel, recruitment procedures, advertisements, instruments, etc.). If changes are needed, a new application must be submitted.
- Per university requirements, all research-related records (including signed consent forms) must be retained and available for audit for a period of at least three years after the research has ended.
- It is the responsibility of the Investigator to promptly report events that may represent unanticipated problems involving risks to subjects or others.

This determination is issued under The Ohio State University’s OHRP Federalwide Assurance #00006578. All forms and procedures can be found on the OREP website – www.orcp.osu.edu. Please feel free to contact the OREP staff contact listed below with any questions or concerns.

Cheri Petley, MA, Certified IRB Professional
Senior Protocol Analyst—Exempt Research
Office of Responsible Research Practices
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Exempt Determination
Version 1.1
Appendix F: Panel of Experts
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The Ohio State University - College of Food, Agricultural, and Environmental Sciences
Extension & Research (OARDC)
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Extension Area Agent, Horticulture
North Carolina Cooperative Extension Service
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