PERCEPTIONS OF INNOVATIVE FARMERS OF OHIO ON EXTENSION AS A SOURCE OF INFORMATION ON SUSTAINABLE AGRICULTURE

A Thesis

Presented in Partial Fulfillment of the Requirements for the degree of Master of Science in the Graduate School of the Ohio State University

By
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The Ohio State University

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ABSTRACT

The purpose of this study was to determine if Extension is a major source of information on sustainable agriculture to a group of farmers known as the "Innovative Farmers of Ohio" (IFO). Sustainable agriculture (SA) is an innovative and environmentally sound set of farming practices aiming at a self-sustaining long-term productivity, supported by the farming-family. The specific research objectives were:

1. To describe the demographic characteristics of IFO farmers;
2. To determine IFO farmers' philosophical beliefs about agricultural issues;
3. To determine SA practices in use by IFO farmers;
4. To describe the nature of communication among IFO farmers;
5. To determine IFO farmers' sources of information on environmentally sound agricultural practices;
6. To describe Extension's ability to meet IFO farmers' needs;
7. To examine implications of this study for researchers in agricultural communication and related fields.

This study was a survey using a mailed questionnaire. The entire population or stratum of practicing 70 IFO members was studied. Instrument validity was checked through pilot testing with faculty and graduate students familiar with sustainable...
agriculture. A Cronbach-Alpha test for reliability was used to measure internal consistency of the study's main constructs. The census had a 100 percent response rate, yielding the following main results.

1. IFO farmers are well educated; 13% hold a Master's degree, one had a Doctoral degree, others had Bachelors, Associate degrees and High school degrees. IFO members are full-time farmers, 70% spend more than 40 hours a week on the farm. Farm sizes are small to medium, 100 acres or less. Farm activities include grains production (70%), livestock (68%) and vegetables (46%). Forty percent have off-farm jobs and 30% have at least one family member helping on the farm.

2. IFO farmers have strong philosophical environmental beliefs. They think that sustainability of the ecological system is more important than short-term profitability.

3. Typical SA practices members follow include low chemical input, cover crops, conservation tillage and crop residue, organic farming and farm enterprise diversification.

4. IFO farmers prefer participatory communication methods in which Extension workers discuss things with them rather than top-down methods where research findings at experiment stations are delivered to farmers without any solicitation.

5. Extension, so far, has played a limited role as a source of SA information for IFO farmers. IFO farmers believe that Extension can do more to help them and seem ready to cooperate with Extension in promoting SA in Ohio.
IFO farmers seen to represent precisely what their name is. They are innovators, they are well ahead of other farmers in the practice of sustainable agriculture. While Rogers (1995) diffusion model indicated that innovators hardly influence agricultural policy, IFO farmers are in a strategic position to influence other farmers, namely, the early adopters to whom the majority of farmers follow.

One major conclusion of this study is that IFO farmers seem to reflect precisely what their name is: innovators. They are leaders in adopting and promoting SA in Ohio. In Rogers (1995) innovators are described as a small group of the farming population who are often willing to try a new idea or practice. Because of the speed at which innovators adopt new practices, they are often not reflective of the majority of farmers. However, innovators can influence “early adopters” whom the vast majority of farmers follow. Thus, IFO farmers can influence agricultural policy indirectly by serving as educators for the rest of the farming population.

Another major conclusion is that Extension needs to adopt a communication approach that is more client-centered instead of the traditional top-down method. IFO farmers would like to engage in a process of dialogue with Extension agents and researchers to share knowledge on their farm situation and seek assistance. This participatory communication method is lined with the new thinking that Extension must be a two-way, problem solving communication process, aimed at meeting clients needs. It would seem that Extension workers can benefit from short and/or long-term training in communication theories and methods relating to participatory communication.
DEDICATION

This study is dedicated to my two children,
Juliana and Samir, the two gifts of God
and the sources of light, hope and joy of my life.

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ACKNOWLEDGMENTS

I want to express my deepest gratitude to Dr. Robert A. Agunga for his guidance, patience and invaluable teaching. He has instilled perseverance and love for perfection in my heart forever. My gratitude also goes to Dr. Joseph Donnermeyer, whose trust in my dream and caring advice exceeded my expectations, and to Dr. Garee W. Earnest, without whose support my dream of getting a Master’s degree would have been almost impossible. I am also greatly indebted to Professor Clair W. Young and his family, who enabled me to pursue graduate studies in the United States, and in so doing have changed my life for ever. My special thanks to Badri Kasae, this very special person of my life, who sponsored in many ways my endeavor. To my two beloved children, Juliana and Samir, my eternal debt of attention and time. You are the light and love of my life.

Thank you for growing healthy, happy and educated even without my presence, taking out of my heart some of the guilt for being so far away from you.

To Dr. N. L. McCaslin and Ms. Doris Kestler, thank you for opening the doors of this school for me. To all those who supported in one way or another my many difficult moments, thank you forever. Beyond all, I humbly thank God for giving me the necessary strength, courage and determination to pursue a dream.
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1976 ........................ B.A. Journalism, Fundação Armando Álvares Penteado

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1990 - 1994 .................... Part-Time Professor, Methodist University of Piracicaba, São Paulo, Brazil.

FIELDS OF STUDY

Major Field .................... Agricultural Education

Minor Field .................... Agricultural Communication
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Rogers' adoption curve
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<tr>
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<tr>
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<td>Community Support Agriculture</td>
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<td>T&amp;V</td>
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CHAPTER 1

INTRODUCTION

This Master’s thesis looks at the information and communication needs of a specific Extension client group who follow sustainable agriculture (SA) practices. The group is called the Innovative Farmers of Ohio (IFO). The purpose is to determine the extent to which Extension meets the information and communication needs of the IFO organization. This introductory chapter looks at the changing nature of U. S. agriculture and implications for Extension. The research problem of interest is how Extension adjusts to changes in agriculture, such as sustainable agriculture and farmers’ demand for client-centered communication.

The changing nature of U. S. agriculture

Agriculture in the United States is changing, and this change can be observed on four main fronts: 1) a growing environmental concern among farmers and consumers; 2) increasing use of environmentally sound agricultural practices; 3) emergence of SA farmers; and 4) a decreasing farm population.

1. Growing environmental concern among farmers and consumers.

Never before has there been such a strong public awareness about the finitude of the earth’s resources. People are expressing a growing interest in conservation,
preservation and ecological issues (Fridgen, 1995). For example, there is a growing interest in recycling programs for paper, glass and plastic. Manufacturing industries are also making changes in products and packaging to reduce damage to the ozone layer. Schools are teaching children the need to recycle and to be environmentally friendly (Kirby et al, 1995). Finally, consumers of all ages are watchful of the presence of hazardous ingredients and chemicals in the food they eat (Frazer, 1994). These environmental concerns of consumers are, in turn, affecting the way farming is done in America.

Commercial farmers are now more sensitive to the use of chemicals, such as fertilizers, pesticides and fungicides, than they were 10 years ago. Researchers have established linkages between farm pesticide usage, pollution and food poisoning or hazardous health consequences.

There are four main reasons why environmental concerns are becoming a major part of today’s agriculture. First, traditional or commercial agriculture is becoming increasingly expensive due to the necessary high input of chemicals and machinery. This dependence on such inputs creates another increasingly heavy dependence on credit and government subsidies (Neher, 1992). For example, although fertilizer is the largest cash expense for corn farmers, representing 32% of the budget for corn production, its rate of efficiency in producing corn declined by 24% in the last 25 years (Ess et al, 1994).

Second, the earth is exhibiting signs of exhaustion after so many years of exploitation, in the forms of soil erosion, pollution of ground and surface waters by agricultural activity, depletion of non-renewable energy sources, environmental and
economic stresses (Smolik et al., 1995). The high cost of inputs was one of the three main concerns of Wisconsin farmers surveyed in 1994 by Williams (1996). Lowering production costs was also among the ten priorities of Midwest farmers (from Indiana, Illinois, Ohio and Iowa) who participated at the 1991 Top Farmers Crop Workshop at Purdue University (Moser et al., 1994).

Third, a series of crises has hit U. S. farmers over the past 15 years, including too much rain, drought, unpredictable land prices and difficulties in obtaining farm credit. Among the natural disasters to hit the U. S. in recent times are the drought of 1988, feed shortages in 1989, the drought, frost and winterkill of alfalfa in 1992; and the floods in 1993 (Williams, 1996).

Finally, the commodity markets are changing. Consumers are increasingly demanding chemical-free food products. In addition, U. S. agriculture experienced one of its worst financial crises in 1986 because of land price speculation (Tweeten, 1995). Indeed, the agricultural crises of the 1980's and 90's has been compared to the Great Depression of the 1930s (Williams, 1996).

Among consumers, the growing evidence of the link between diet and health has increased public awareness of the nutrient profile of foods and the consumption of fruit and vegetables. The public usually becomes concerned with the products it consumes when there is an “easily identified crisis at hand [that is] publicized by the media” (Priest, 1988, p. 58). U. S. consumers have a long history of influencing the way agriculture is practiced. In the 1960s the consumerism movements became stronger and caused changes in legislation, such as the 1960 Hazardous Substance Labeling Act and the 1966
National Traffic and Motor Vehicle Safety Act. It was also due to consumer agitation that the Consumers Federation of America, an organization dedicated to challenging the government on consumer concerns, was created in November of 1967 (Priest, 1988).

The growth of organic farm product markets in Europe and the U.S. led to the establishment of a program for certifying organic growers in these countries. Recent data from the Welsh Institute of Rural Studies in Great Britain (1996) showed a more than 100% increase in certified organic farms throughout Europe over the past 10 years. In Austria, the increase has been a phenomenal 3,800% jump. Although organic farms still represent an average of only 17% of total agricultural areas in Europe, this trend cannot be dismissed.

According to the Food Marketing Institute Report (1993), many consumers rank agrochemical use as the most important food safety concern, especially after the Food and Drug Administration Report of 1992 found that more than 40% of fruits and 33% of vegetables sampled contained pesticide residues. At the same time, farmers are increasingly adopting alternative practices to control pests and diseases, such as crop rotation and biological control and disease and pest-resistant seeds (O'Brien, 1993). New consumers are also demanding more grains and cereals in their diets. Adjustments are being made in the dairy market to meet new standards toward low-fat products. Also, in the livestock business, the trend indicates a demand for leaner red meat, more fish and poultry (Frazao, 1994).

Since Earth Day was created in 1970, the U.S. government has promised to support and preserve the environment through the National Environmental Policy Act and
laws such as the Clean Air Act, the Safe Drinking Water Act, the Federal Water Pollution Control Act, the Noise Control Act, the Federal Environmental Pesticide Control Act, the Federal Insecticide, Fungicide and Rodenticide Act, the Toxic Substances Control Act, and the Resource Conservation and Recovery Act. All of those regulations have had a substantial impact on businesses and industries, and probably one of the most important of these impacts is that it has made clear how the viability of business depends on a society's utilization of the environment (Brunner 1980). Corporations have begun to understand that money spent today in minimizing environmental impacts could lessen the need for expenditure of much larger amounts in cleaning up the damages.

In environmentally-concerned farmer associations, the majority of members are not farmers, but consumers interested in food safety issues. For example, of the 906 members of the Ohio Ecological Food and Farm Association (OEFFA), only 18% are certified farmers, and 82% are non-certified farmers and people who describe themselves as "consumers concerned with ecological aspects in agriculture" (OEFFA Report, 1995). Similarly, the Innovative Farmers of Ohio, which is the focus of this study, has 120 members but only 70 are actually farmers.

In summary, the growing environmental concern of both consumers and farmers needs agricultural organizations to be concerned about food safety and improving public perception of agriculture.

2. Increasing use of environmentally sound agricultural practices.

A second indication of the changing nature of U. S. agriculture is that many farmers are voluntarily adopting environmentally sound practices. For example, data
from the USDA Statistics (1995-1996) shows an increase in the size of farms and a
decrease in the number of farms. It also reveals a decrease in the amount of farm
machinery used by up to 69% with some equipment, especially field cultivators, forage
harvesters and combines. A 1994 Ohio State survey of Integrated Pest Management
Coordinators showed that 40,000 farmers in 32 states have significantly reduced their use
of synthetic pesticides (Fernandez, 1994).

Data collected for the "Agricultural Profile of the Great Lakes Basin" prepared in
April 1996 measured, among other things, the extent and intensity of agricultural land
use. It also indicated a slow decline in the total area being farmed, while the remaining
land area in agriculture was farmed more intensively. The consequences were measured
as: 1) an increase in urban populations and suburbanization, with a resulting decrease in
the number of farms near urban areas (Toronto, Buffalo, Rochester, Windsor and
Detroit); and 2) a need for intensification of farm operations due to related economic
factors. It is important to note that this study also demonstrated that farms situated
around urban areas are generally profitable, but land used for non-agricultural purposes
(e.g., residential, commercial and industrial) has more impact on the environment than if
it were being farmed (Great Lakes Commission, 1996).

In Ohio, a longitudinal survey on the "Organization and Performance of Ohio
Farm Operators" covering a period from 1986 to 1992, showed a 12% decrease in
conventional tillage among commercial farms and 14% among part-time farmers. On the
other hand, there was an increase in conservation tillage (no till and minimum till) of up
to 120% among commercial farmers, and of up to 100% among part-time farmers in the same period (Stout et al., 1992).

Another study in Ohio, with data collected over a 15-year period (1979-1993), of the Knox County Conservation Yield Contest participants, showed that they reduced their use of fertilizers, insecticides and herbicides while still achieving above average yields (Barker and Miller, 1996). A 1992 survey of “Ohio Commercial Farms Only,” that is, operations with sales exceeding $100,000, demonstrated that up to 70% of the operators of these farms had adopted at least one conservation cultural practice that can be identified as environmentally sound. Forty to 70% of Ohio’s commercial farmers are using crop rotation systems in cultures with hay, wheat, soybean and corn. Up to 17% are using disease/insect resistant cultivars, 5% are using strip cropping, and 3% intercropping (Batte, 1992).

The data demonstrated that there has been a decrease in the use of herbicides: more than 6% of commercial farmers are spot spraying instead of broadcasting herbicides, and almost 28% are applying only postemergence herbicide. Only 40% of these farmers are using insecticides on corn (less than 1% is using insecticides on wheat) and less than 3% are using fungicide on corn, soybean, wheat and hay. Almost 1% of soybean producers are practicing biological pest control (Batte, 1992).

The data above shows that farmers are becoming increasingly aware of the impact that certain farming practices have on the environment and how it affects farming production. The number of U.S. farmers who have already changed to a more
environmentally-sound set of farming practices is increasing even outside the ecological associations and is accompanying what might be a worldwide trend.

3. Emergence of the sustainable agriculture movement

Although mainstream commercial agriculture is becoming environmentally aware, the speed of change may have been too slow for some farmers who have organized into groups called "sustainable farmer associations". Beginning in the early 1970s, many farmers associations were created such as Acres U. S. A., Farmer-to-Farmer, Leopold Center for Sustainable Agriculture, and Ohio Ecological Food and Farm Association (OEFFA). These ecological farmer associations differ sometimes markedly, and sometimes subtly, regarding their agricultural practices and their philosophical beliefs about the nature of the ecosystem. Certified organic farmers, for example, will not use chemicals or will use only non-petrochemicals in small quantities. However, they will use tractors. On the other hand, sustainable agriculture farmers use small quantities of chemicals, but avoid the use of large machinery (OEFFA Organic Certification Standards, 1996; IFO Newsletter, Volume 1, no. 1 & 2, 1994).

There are 39 certification agencies throughout the country responsible for checking, in each state, the standards of 4,091 organic farmers (OEFFA Annual Report, 1996). These organic farmers represent only 0.2% of the total number of farmers in U. S. (The Organic Farming Research Foundation, 1995). The 1996 National Organic Directory lists 800 organic industry businesses, and the Sustainable Agriculture Directory of Expertise has 723 organizations in all 53 states.
However, the number of organic farmers is on the rise. In Ohio there has been an increase of almost 200% in the number of certified organic farmers from 1990 to 1996, that is, from 58 to 170 registered farmers (OEFFA Report, 1996). One of the fastest growing sustainable agriculture groups in Ohio is the IFO, which will be the focus of this study.

In Europe, the growth in the number of sustainable agriculture farmers is even faster, as evidenced in Figure 1. Take, for example, the case of Denmark and Italy, who increased by 8,000% and 4,000% respectively their organic fields from 1985 to 1996, and Austria, with an increase of 3,800%. The smallest increase in organic farming in Europe was 142% in Luxembourg.

Unquestionably, this growing population of sustainable agriculture farmers is likely to make demands on extension services to meet their communication and information needs. Given their novelty, the question of interest to this study is whether extension systems are ready to respond to the needs of these farmers. This research question will be addressed in the context of IFO farmers.

4. Diminishing farm population.

The final item to be examined under the changing nature of U. S. Agriculture is the diminishing farm population. Demographic data from the U. S. Bureau of Census shows that the growth of rural America lags behind urban America. From 1970 to 1990, the country’s urban population increased 24%, while rural population increased only 15%. Even more significant is the number of people exiting agriculture. The percentage
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Table 1.1: Number of hectares of certified organic and in conversion land in European Union

of farm population decreased by 58% in the same period, that is, from 4.3% of the total U. S. population to only 1.8%.

Not only is the farm population decreasing, but much farm land is being converted into urban dwellings and industries. Rural/urban interface is an issue that has
challenged agricultural administrators since the 1980s, when the country lost nearly 2,000 acres of prime land each day to urbanization (Jackson, 1980). The growing number of large-scale farms is associated with the decline in local employment and a lower income for rural people (Lobao, 1990). The loss of “family farms” poses a concern for those still on the land: should they sell their small acreages to corporate farm owners and flee, or should they stay on the land and try to make the best of it? Put another way, what are the philosophical views of IFO farmers with respect to land stewardship and economic prosperity? This study will investigate these issues.

Research problem statement

Sustainable farmers are becoming a major group in American agriculture. Although the commercial or traditional farm population dominates, sustainable agricultural producers are demanding the attention of agricultural and horticultural Extension agents as well. The question is whether they are receiving any attention.

Sustainable agriculture (SA) refers to agricultural production in more holistic terms, where production, processing, distribution and consumption issues are examined together. It is a systemic view of agriculture that includes suppliers, farmers, processors, consumers and the environment, and attempts to ensure that changes to one part of the system do not adversely affect other parts (www.nal.usda.gov, 1996). It refers to a multi-disciplinary approach to agriculture that involves economic profitability and environmental compatibility. The objective is low inputs of chemicals and machinery in production, while ensuring high productivity (Stark, 1995). Sustainable agriculture does
not infer low technology agriculture, since it requires scientific research in plant varieties, production practices and productivity with low chemical or machinery input.

Other labels for SA are “alternative agriculture,” “organic agriculture,” “regenerative agriculture,” “eco-agriculture,” “permaculture,” “agroecology,” and “low-input farming” (Lasley et al., 1993). SA seeks to bring the traditional/commercial agriculture back to farm life, as well as environmental stewardship, and family values. Lacy (1993, p. 41) defined SA as a “system economically sound, socially acceptable and environmentally compatible,” the main focus of which is equitable decisions regarding environment, costs, benefits and society. The common elements to all those different labels are: 1) environmentally sound practices; 2) philosophical considerations; 3) reduced reliance on manufactured inputs such as pesticides and fertilizers; and 4) use of appropriate technology, reduced consumption of fossil fuels and greater farm self-sufficiency (Lasley, Hoiberg & Bultena, 1993).

SA farmers value cooperation, preservation of farm traditions and rural culture, small communities, farm work, and quality in agriculture. In contrast, the industrial model of farming emphasizes speed, quantity and profit. Industrial/commercial farmers are motivated by self interest and lack of interest in farm traditions and rural culture. For SA farmers, the focus is on the interdependency between humans and nature, the family farm and neighborhood cooperation, and a holistic approach to problem-solving.

The question of interest is the extent to which the Extension system in America recognizes the needs of these emerging innovative farmers. This research problem is
examined in the context of the Innovative Farmers of Ohio (IFO), one of the many groups of U.S. farmers practicing sustainable agriculture.

Agricultural practitioners are challenged to become more environmentally friendly. Farmers are finding ways to make profit with lower chemicals and are also being less exploitative of natural resources. In the process, many of them have had to adopt innovative practices from wherever they can get them. Some may have learned from the success of their neighbors; others may have learned about success stories in other parts of the U.S. or even the world. For those who may have had to look externally outside their communities, they may have had to rely on the mass media, publications or even the latest communication technological gadgets, such as the Internet. Still others may have had to request the help of their extension agents.

The questions of interest to this study are these: How do SA farmers get information on new environmentally sound farm practices? Do they get help from Extension or have they had to depend on themselves? If they rely on themselves, do they still need Extension’s help?

**Purpose and objectives of the study**

For decades Extension has been at the forefront of change in agriculture. In large part, Extension has promoted the adoption of innovations through the diffusion of innovations model (Rogers, 1962, 1983, 1995). Accordingly to the diffusion model, innovators, a small group of farmers, are often the first in society to adopt a new practice. While, by their small number, innovators often do not influence agricultural policy directly, the model shows that they do indirectly by influencing early adopters who, in
turn, influence the majority of farmers and hence, policy. Thus, innovators are pace-setters and, given an enabling environment, innovators can help speed up the process of change.

Thus, this study proceeds on the assumption that Extension can help SA farmers in their operations by assisting them in gaining access to new ideas and practices, and by taking the findings of IFO farmers to other farmers, hence the spread effect. Therefore, the general purpose of this study is to explore Extension issues in SA by examining the information and communication needs of IFO farmers and how they go about meeting these needs. Communication and information are the means by which Extension agents relate to farmers. Through effective communication Extension agents learn the needs and concerns of clients. Information is the outcome of what is exchanged between farmers and agents. A traditional Extension approach is where information from research centers are transferred in a top-down fashion from agents to farmers, irrespective of whether farmers request it or not.

Thus, communication is dialogue which permits the exchange of experiences of two or more people in such a way that the one who knows a little can exchange information and learn together with the one who thinks s/he knows nothing (Freire, 1973). It can also be described as an interaction where the participants exchange information and meanings in various ways (Axley, 1996). How do IFO farmers get information? Does Extension rank high among IFO farmers sources of information? How do IFO farmers communicate? Does Extension participate actively in IFO communication processes? This study is thus aimed at exploring how the process of
communication interfaces with the transference of new information in agriculture among farmers, and how this process impacts Extension work.

Other purposes of this study are: a) to find out the philosophical views of IFO farmers regarding SA; b) how IFO functions as a dynamic social organization; and c) the extent to which Extension meets IFO members' information and communication needs.

The Extension Service in the U.S. has always been at the forefront of change. Extension has served as the main link between land-grant experimental research stations and commercial farmers, taking farmers' needs and concerns to researchers and returning to them answers found through scientific research. But what is Extension doing for SA farmers in Ohio? Does the Ohio Experimental Station serve as a major source of SA research? Does the Ohio State University Extension serve as a link between research and IFO farmers in the same way as it does for mainstream commercial farmers?

The specific objectives of this study are:

1) To describe the demographic characteristics of IFO farmers

2) To determine IFO farmers' philosophical beliefs on land stewardship and environmental sustainability

3) To determine sustainable agricultural practices in use among IFO farmers

4) To describe the nature of communication among IFO farmers

5) To determine IFO sources of information on environmentally sound agricultural practices

6) To describe IFO farmers' attitudes toward Extension
7) To examine implications of this study for agricultural communication and other researchers

**Research population and methodology**

The population for this study is members of the Innovative Farmers of Ohio. Founded in 1994, IFO has 120 members, 70 of whom are active farmers. It is a grassroots organization interested in preserving Ohio’s land and waterways through the practice of sustainable agriculture. IFO farmers are also interested in issues of significance to rural farm families, such as education and community activities. The main advantage of focusing on IFO farmers is that these farmers do much of their own research on sustainable agricultural techniques necessary to preserve and strengthen Ohio’s environment. They also engage in “farmer-to-farmer” communication activities where they share knowledge of innovative SA practices. IFO farmers conduct their own experiments, searching for information on sustainable techniques in different communication media and sources, exchanging information among the members of their own group and with other groups of sustainable farmers. If these farmers aggressively seek information this way, do they need Extension?

**Significance of the study**

The Cooperative Extension Service seeks to stay at the cutting edge of societal change, particularly in the field of agriculture. Sustainable agriculture as a movement is evidently a new dimension of change in agriculture. The extent to which Extension administrators and agents support and understand SA farmers is an indicator of Extension’s role as the harbingers of new ideas. However, Extension can not help these
farmers if it does not know what their information and communication needs are.

Therefore, this study has a significant contribution to Extension in Ohio and elsewhere as it is perhaps the first of its kind aimed at collecting information from SA farmers in Ohio. Another significant contribution of this study is that it has the potential to reveal ways agricultural communicators can contribute to improving communication between Extension and its clientele.
CHAPTER 2
REVIEW OF LITERATURE

Introduction

This chapter reviews theories underlying sustainable agriculture (SA), the role of Extension in agricultural development, and the role of communication in Extension. The main purpose of the Chapter is to point out the importance of communication in Extension work relating to SA.

Sustainable agriculture as a new field of study.

Sustainable agriculture (SA) is identified as a set of environmentally sound agricultural practices such as low use of chemicals and other non-aggressive techniques. SA movement is aimed at promoting a positive social, cultural and family rural environment.

SA was first referred to as an ecological interaction agricultural system (Jackson, 1980) and a “stable” agriculture that integrated farming and society “for greater efficiency of resource use, and a balance with the environment that is favorable both to humans and to most other species” (Harwood, 1990, p.4). SA tries to optimize the use and management of on-farm resources in order to guarantee profitable yields (Parr et al., 1990).

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SA is derived from the organic agriculture concept developed before World War II. This concept emphasizes recycling of farm-generated nutrients and avoidance of synthetic pesticides. There are many SA terminologies in use with subtle differences. However, together they represent a need for environmentally sound agricultural practices. These concepts include:

1. "Sustainable," that is, the capability of enduring evolving;
2. "Alternative," refers to a different option from the mainstream;
3. "Low-input," or "low-external input," refers to less use of materials from outside the farm;
4. "Ecological," refers to processes concerned with environmental preservation;
5. "Regenerative," means restoring the resources in the environment;
6. "Organic," before WWII meant only the recycling of farm-generated nutrients but now it is used to define both a synthetic chemical-free farming system and a particular class of chemicals (Locke-rett, 1990).

Gips (1984) defined SA as an ecologically sound, economically viable, humane and socially just agricultural system. However, Rodale (1983) expanded this definition to include a regenerative agriculture system, able to restore natural resources. Still yet, Francis and Hildebrand (1988) developed a definition that took into account SA methods, such as the right choice of hybrids and varieties, soil and pest management, tillage practices and high production and profit. In 1988 the United States Agency for International Development (USAID) described SA as a system able to meet growing human needs while improving the natural resources base. In the same year, Bird
emphasized the need for knowledge and management input as a means of adding biological, environmental and human capital to agriculture.

Edwards (1988) focused his definition of SA on the necessity of agricultural systems to be less dependent on energy and synthetic chemical inputs, while being more management-intensive than monocultures. The American Society of Agronomy (1989) added to all the above SA definitions a concern with farmers themselves, their families and society in general. The United States Farm Bill of 1990 described SA as an agricultural system that “will be productive, competitive and profitable; conserve natural resources; help protect the environment; and enhance public health and safety” (p.47).

A delphi study designed to verify SA definitions among agricultural scientists at North Central region land-grant universities, showed that these scientists envision SA as avoiding environmental degradation through the use of new technologies. The scientists viewed SA from a stewardship perspective. However, they did not include in their definitions any social considerations, such as the idea that SA is responsible for provoking social changes (Walter & Reinson, 1994).

Parr et al. (1990) note that sustainable farming techniques do not represent a return to the agriculture that was practiced in the 1930s. They argue that SA farmers not only use modern equipment but also apply the most recent research on plant development, soil and water conservation and livestock operations. The main characteristic of SA is minimizing the need and use of fertilizers and pesticides through crop rotation, integrated crop and livestock management, and crop residue and manure recycling. Techniques or practices that characterize sustainable farming systems include:
1) Soil nutrient management; 2) Crop rotation; 3) Use of organic fertilizer; 4) Low tillage; 5) High crop diversity; 6) Pest biological and cultural control; 7) Nutrient recycling; 8) Integrative livestock management; and 9) High use of decomposition processes.

**Background to the SA movement**

Some of the earliest references to the term "sustainable agriculture" date back to the early 1980s, with the emergence of a regenerative agriculture (Rodale, 1983) and ecological interaction (Harwood, 1990). However, the first organized and defined movement of growers with a sustainable philosophy was the bio-dynamic movement, born from Rudolf Steiner's anthroposophy lectures, in 1924. Anthroposophy is a 20th century religious movement centered on human development. The biodynamic concept relates to a farming system that uses only organic materials for fertilizing and soil conditioning (Webster, 1995). Its basic practices are: (1) ageless sound farming and gardening techniques; (2) execution of principles such as diversification, recycling, avoiding chemicals, decentralized production and distribution; and (3) measures and concepts of wholeness, i.e., the consideration of cosmic and terrestrial forces and their influence on biological organisms.

From 1930 to 1960, another school of thought developed from biodynamics, focusing on the importance of humus in agriculture and on the adverse effects of synthetic fertilizers. In 1943 Sir Albert Howard's *An Agricultural Testament* founded the roots of ecological agriculture. These ideas were also advocated and expanded through works of Lady Eve Balfour, *The Living Soil* (1943); Faulkner's *Plowman's Folly* (1943);
J. I. Rodale’s Pay Dirt (1945); Rachel Carson’s Silent Spring; and Louis Bromfield, among others. All these writers debate sustainability concepts of wholeness, ecological models, the fragile relationship between humans and the environment, and new farming practices.

The interest of this study on SA arises not only because of its novelty, but more importantly because of its implications for Extension. To what extent are these SA practices a concern for Extension?

The philosophy and practice of Extension

The Cooperative Extension Service (CES) 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.” It was created particularly to address the needs of the population, whether rural or urban, but with more early emphasis on rural (Christian, 1959).

The Extension concept, however, actually began in 1862, when the Morrill Act created the land-grant universities. Land-grant universities were the major educational institutions that the federal government established in each state to teach “agriculture and mechanic arts.” Soon the work of the early agronomy and livestock professors demanded funding for applied research, which came with the advent of the Hatch Act in 1887. The research centers became, therefore, the second component of the land-grant system. Once funded to work in research, the land-grant professors became concerned with transferring results of their work to farmers. Many attempts were made to diffuse information, such
as a trainload of professors who would tour the state spreading word about new practices and seeds. Bulletins were written and distributed, county fairs were organized by the farmers themselves but the results were far from being satisfactory (Rogers, 1995).

In 1911 a successful first trial began in Broome County, New York, with a county extension agent assigned to diffuse innovations to farmers in that area. The idea spread around the country and gained strength through the Smith-Lever Act of 1914 (Rogers, 1995). This Act specified that the purpose of the Cooperative Extension System (CES) was to teach and give practical demonstrations in agriculture, home economics, and rural energy, to individuals not able to attend the land-grant institution. The CES was created to be a vehicle for human development through non-formal, off-campus education. It was considered the educational arm of the United States Department of Agriculture (USDA) (Boone, 1988).

Officially the oldest diffusion system in the United States, Extension has been responsible for important agricultural achievements, such as the diffusion of the hybrid seed corn in Iowa from 1930 to 1950 and the “agricultural revolution” of the 1950 and 60s, when the innovations diffused by this service enormously increased farms’ productivity (Rogers, 1995).

The 1914 Smith-Lever Act that created the CES specifically states that the philosophy of the Extension service is to promote a “complete and absolute revolution in the social, economic, and financial condition” of the rural population, letting clear, however, that not only farmers were to be the CES clientele (Boone, 1988). Imbued with
this mission, CES philosophy was designed to serve as a tool to progress, to leadership development, to better education and better living for all Americans (Boone, 1988).

As a system of non-formal education aimed at improving people's life condition, Extension teaches people to: 1) identify and assess their own needs and problems within their life context and situation; 2) acquire necessary knowledge to cope with these needs and problems; and 3) feel motivated for action. To accomplish these goals, the CES has three guidelines:

1) empowerment of the client - to be accomplished through the transfer of relevant knowledge for use in controlling the individual's world;

2) importance of rural life - it is shown in the importance given for the extensionists' professional work and in the value placed in the farmers' beliefs and lifestyles; and

3) faith in the future - expressed through what is defined as one of its most powerful principles: planned change, or the use of scientific knowledge to improve human system's operations (Boone, 1989).

Extensionists believe that change and technology are good and can help humans to shape their future. They also believe that reality can be studied and to a certain extent explained, predicted and thereby controlled. Extension looks at the world from a system's perspective, in which their knowledge resources are drawn from the various disciplines to build effective programs for its clients. The extension agent is the catalyst for this knowledge transference that will bring change and development for individuals. The Extension system has also a feedback mechanism that allows bottom-up input, so
that programs can be adjusted with information provided by field workers and clientele (Boone, 1989).

Extension practices

Boone (1989) has identified four models of Extension throughout the world. These four models have in common two characteristics: they all try to organize in different levels human communities regarding agricultural issues and address with more or less emphasis the educational needs of these communities. The models are:

1) The "typical developing country extension system," which tends to be unidirectional (top-bottom control and direction); is strongly attached with governmental institutions; has intensive political control; and performs both regulatory and educational functions.

2) The "training and visit" system (T&V). It was developed by Daniel Benor (see Benor & Harrison, 1976) and adopted by the World Bank in the late 1970s. T&V is currently used by many developing countries. Under this model, Extension helps small farmers who use low-level technology and traditional methods to optimize crops and livestock production, through intensive training and the use of village extension workers.

3) The "farm system research and development model" focuses on improving small family farmers' well-being through increased productivity resulting from the utilization of on-farm research findings.

4) The United States Cooperative Extension Service, aimed at promoting: a) family farming; b) education and research; c) an accountable organizational structure to help people set their goals and select appropriate programs for their communities; and d) communities involvement through the fostering of volunteer activities to implement programs.
These models combine with other activities to accomplish the Extension mission of "helping people help themselves." These activities are related with continuous learning processes and needs assessment, combination of agriculture and other fields of scientific expertise to address individuals' needed changes and high idealism. Extension has been trying to emphasize individual's ability to change and to build a future better than the past or the present (Boone, 1989; McDowell, 1988; Dillman, 1985; ECOP, 1987).

The efficiency of the U. S. Extension model made it an attractive export product after World War II. The Point Four Program, part of 1949 Harry Truman's Marshall Plan, enabled U. S. land grant universities to spread since 1950s what was then called "community development programs" to countries such as India, Brazil, Dominican Republic, Somalia, Uganda and Burma, among others (OSU International Impact Report, 1989).

Rogers (1995) identified three basic approaches then used by Extension. The first is called "technology transfer", i.e., a top-down approach, where research priorities are determined by scientists and farmers' knowledge and preferences are not considered. Extension agents transfer the information to farmers, who might not immediately adopt the new technology very soon, since they believed it might not work as well in the field as it did in the laboratory. The most innovative and wealthy farmers who were willing to try new ideas may have had an advantage over the others, as they had enough resources to risk. In other cases, a recommended new technology may create many problems later on.
The second is the "farmers only" model, where farmers determine priorities and directions for research, while they also get involved in the actual experimentation, usually conducted on the farms. The limitation of this approach is that farmers may not be aware of all the components of the economical and political systems as well as of the private sector that might affect agricultural decisions.

Finally, there is the "participatory model," which is a more cooperative approach. Researchers, extension officers and farmers work together in focus groups and workshops. Participatory rural appraisal techniques are used to assess priorities and reach involvement of all the elements important to the rural setting. Under this approach, packages of technology are used rather than single innovations. One recent example of this model is the integrated pest management program (Fiegel, 1993; Foster et al., 1995).

Beginning in the mid 1980s, the U.S. Extension system has been the target of criticism. Anderson & Bloome (1995) noticed a need for Extension to change toward a more participatory involvement with its clientele. They stated that Extension needed to start listening to people's real needs, experiences, insights and expertise, thus starting a collaborative partnership with clientele and the numerous agencies that comprise extension and research. Other reactions came from Boone (1989). He observed that: 1) Extension was emphasizing more its regulatory aspect rather than its educational role; 2) Extension workers were not integrating technical expertise with behavioral or process components related to the transmission or communication of information; 3) Extension neither defined the conceptual nature of its work for a program of study in Extension, nor
established an continuing in-service training; and 4) Extension did not train its workers to
view their clientele as learners and to understand their own role as facilitators.

The 1995 ECOP Report recognized Extension's lack of ability to emphasize both
rural and urban clientele, serve the needs of diverse audiences on critical issues, integrate
university research, expand partnerships, and develop the decision making capability of
local communities. The 1995 ECOP/CSREES Annual Report addressed the need for
Extension to reach the needs of its growing diverse audience through learning
partnerships, valuing local program development decisions, and particularly serving as a
galvanizer of all the forces that help communities adjust to an ever changing world.

As result of these criticisms, in this same 1995 Report, Extension recognized the
urgency of changing to a more participative and collaborative involvement with farmers.
The questions that arise in this point is how Extension is addressing its own needs;
determining what systematic program to use; and developing the necessary
communication skills to reach out its clientele needs. In Ohio, OSU Extension is "re-
inventing" its system by developing programs in new areas such as food and nutrition,
balancing work and family, small animals, agronomy, watershed management and forage
utilization. The Project Reinvent in Ohio is a Kellogg Foundation program designed to
review the focus of land grant institutions and determine how to meet the needs of society

New challenges in Extension

Society is changing and bringing new values. Among these changes are ethical
considerations, community norms, family structure and population mobility. Issues of
concern also include the aging of the population, growing population diversity, increasing economic disparity, rural to urban population shift, reduced sense of community and the rise of global economy and interdependence. Advances in science and technology bring with it awake a growing concern for environmental quality and political uncertainty.

These trends are requiring Extension to adapt its programs and staff to specific audiences, delivery methods and operating structures. Extension also has to prioritize its programs to meet limited resources, and at the same time it has to develop new communication techniques to reach a growing variation of clientele (1995 ECOP Report).

**Diffusion of Innovations Model and Extension**

The importance of communication in Extension is evident in the diffusion of innovations model by Rogers (1995). He defined the model as a special type of communication, a process in which an innovation is transmitted over time, through certain channels among the members of a social system. He also defined communication as “the process in which participants create and share information with one another in order to reach a mutual understanding” (p.6). He implied that communication is a two-way process of meanings convergence, and concluded that when communication has a message containing a new idea, this is a diffusion of an innovation. Redding (1972) also defined communication as a process of creating meanings, whether they come out of a source of information, or they are provoked in the individual by any means. Asley (1996) further defined communication as something that provokes meaning for an individual, no matter what this “something” is. Accordingly to Rogers (1995),

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communication is the process by which Extension work is done. Diffusion of innovation is a kind of social change, when a social system is altered in its structure and functioning.

In the early 1950s, an innovation was defined as any thought, behavior or thing perceived as new because of being qualitatively different from existing forms (Barnett, 1953). Boulding (1985) defined innovation, using an economic perspective, as a new and economically useful knowledge, whose system of production and diffusion was the responsibility and prerogative of the nation state. Rogers (1995) expanded the concept by defining innovation as any idea, practice or object perceived as new by an individual or a group.

An innovation, however, is generated from a recognition of a perceived need or problem. The recognition of the need will encourage research to find a solution for this need. The findings, or the solution for the need, will have to be available to those who need it. And the way it is done is through communication (Rogers, 1995). In the process of adopting a new idea or practice the potential adopters will pass through five stages:

1) Knowledge stage - when the individual or group is exposed to the new idea/practice whether by the media (radio, TV, newspaper) or by other members of his/her group;

2) Persuasion stage - when another individual or group adds further explanations, personal impressions and experiences when first exposed;

3) Decision stage - is the actual decision to adopt, when the innovation is incorporated;

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4) Implementation stage - is the initial use of the innovation, which requires great efforts in adapting to a new routine and getting acquainted with its specific features; and

5) Confirmation stage - when the adopter (individual or group) begins to divulge the innovation to others who are still unaware, thus becoming a source of information for the innovation (Roger et al., 1988).

Different communication channels are emphasized in each one of these stages, and each communication channel plays a different role for individuals. Basically, there are four types of communication channels: a) Interpersonal - involving face-to-face interaction; b) Mass media - includes radio, TV and newspapers; c) Local - includes interpersonal and mass media channels inside the social system; d) Cosmopolite - includes those channels outside the local social system. Mass media communication is more important during the knowledge stage, and peer communication is more appropriate in the persuasion, adoption and confirmation stages (Rogers, 1995).

The adoption of an innovation is an outcome of learning or a communication process (Berlo, 1960; Rogers, 1995). This implies a need for studying the factors related to the flow of information. In considering the processes of communication and learning, and how they impact on the adoption of an innovation, other aspects have to be examined as well.

Everett M. Rogers is considered one of the early authors in diffusion of innovations research, and his first study on the topic dates back to 1962. Rogers described many aspects of innovations and the diffusion of innovations, and also focused on the five characteristics of innovations that influence the adoption rate:
1) Relative advantage or the degree of perceived betterment that the innovation will bring to the individual. The greater the relative advantage, the faster the adoption.

2) Compatibility or the extent to which the innovation is consistent with the values, past experiences and needs of individuals or groups.

3) Complexity or the level of difficulty to understand and use the innovation. The simpler it is, the faster it will be adopted.

4) Trialability or the degree to which an innovation can be experienced by individuals or groups in order to reduce the uncertainty about its use. People will be more likely to adopt an innovation that can be experienced in advance.

5) Observability or how the results of adoption are visible to others. The easier it is to see the results of an innovation, the faster it is to incorporate the innovation into the individual’s practices. (Rogers, 1995)

**Innovation adopters**

Rogers’ first classification of adopters, as identified in the 1962 study, plotted the speed of adoption utilizing a bell-shaped curve. The first adopters, or innovators, are on the leading edge of the curve. The laggards, or late adopters, are on the end. The majority of early adopters and late adopters are located in the middle of the curve. Each category can be described as follows: 1) **Innovators**, usually 2.5% of the population, are first in trying any innovation. They are obsessive in searching for new ideas, have their circle of friends outside the local group, have more financial resources and are usually better educated; 2) **Early adopters**, approximately 13.5% of the population, are more integrated in the local community, where they are respected and considered good.
advisers, 3) *Early majority*, 34% of the population, adopt innovations before everybody else does. They are the largest group, rarely hold leadership positions, are more likely to be followers, but provide support for the rest of the social group to adopt the innovation; 4) *Late majority*, another 34% of the population, will only adopt the innovation due to economic or peer pressure. They are skeptical and will only adopt an innovation when most of the uncertainty has been removed; and 5) *Laggards*, 16% of the population, are the locally and past oriented, suspicious and resistant toward innovations, usually live in precarious economic conditions and are less educated. They are the last ones in the bell-shaped curve to adopt any innovation, if they ever do.

Figure 2.1: Rogers’ adoption curve
(Extracted from Everett M. Rogers’ 1995 *Diffusion of Innovations*, p. 262)

Diamond (1977) described the influence of personal and psychological aspects such as critical thinking, self-esteem, need for social approval and low-dogmatism, and a more flexible attitude toward innovations and changes. His study showed that open-
minded and less dogmatic individuals are more innovative and likely to adopt innovations.

Other authors have studied the field of innovation diffusion, focusing on several components of the process. Bhola (1965) looked at the diffusion of innovation process through the relationship of social units, i.e., individual to individual, groups, institutions or cultures. The social interrelationships would be the means for the diffusion of innovations to occur, and its movement will be always toward provoking change and adoption. Douglas (1975) suggested a structuralist approach, emphasizing the need for points of connection between internal and external structures of the innovations and the targeted potential adopters, which would be essential for the diffusion and adoption processes.

Berry (1977) expanded the geographic model of the innovation diffusion process. He focused on the human nature aspect of expanding world relations with other people, extending its fields of activity and sphere of influence far beyond the limits of the nearby territory. According to this theory, the diffusion of innovation is a self-propelled movement, impossible to be subjugated, as it is part of the same force that expanded human life and activity throughout the planet. Valente (1993) developed a general mathematical model of diffusion of innovations, but emphasized that there are three distinct approaches depending on the innovation and on the adoption setting where it is supposed to be adopted: the interpersonal influence, the mass media, and a mix of these two systems. Through his mathematical model, Valente explored a way to calculate the

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cumulative proportion of adopters in any diffusion process by calculating numeric relationships between population size, the rate of diffusion and the time period.

The importance of understanding this process is due to the relationship between diffusion of innovation and technological development. The process of spreading new technologies is not only characterized by being gradual, but also cumulative, with important economic consequences. It is said that the process of innovation diffusion itself naturally brings technological change and improvement (Hagedoorn, 1989). The reason for this is that the communication network is built into the process of innovating, and of transmitting new information that reinforces its adoption (Rogers, 1995).

A communication network consists of interconnected individuals who have the same pattern of information flow. Although individuals who share the same pattern - homophilous - tend to communicate more often, the source of new information is more likely to be heterophilous - or those links of low proximity. If the source of the innovation is an outside source, the adoption rate will definitely be influenced by peer opinion. In the case of ideological innovations the role of peers is still more important. As a new value, it needs the reliability and the support of the social group in order to be considered for adoption. The building of such levels of confidence occurs through interpersonal contacts and discussions (McAdam & Paulson, 1992).

Selected studies have also shown that mass media channels are more important than interpersonal connections for early adopters of innovations, while interpersonal channels are essential for later adopters. Early adopters need less time than late adopters

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to make decisions about changing, as well as between awareness and the decision period (Rogers, 1995).

Diffusion of innovations is a communication activity, hence if Extension is to accomplish the goal of spreading innovations to farmers, extension professionals must master communication techniques. It means that Extension professionals, have to be effective communicators. The extent to which communication impacts in Extension will be further explored in the following section.

**Extension and communication**

Extension agents have been the main channel for delivering information to clientele. The mission of the change agent is to facilitate the flow of new information among potential adopters. He/she has the potential to influence people in their decisions whether or not to adopt innovations.

Rogers (1995) listed teachers, consultants, public health workers, agricultural extension agents, development workers and salespersons as change agents (p. 336). Change agents usually have a better education or at least more expertise in the field where they promote change. Their roles are basically to:

1) develop a need for change;
2) establish an information-exchange relationship;
3) diagnose problems;
4) create intention to act;
5) stabilize adoption and prevent discontinuance; and
6) develop a self-renewing behavior on the clients.
Specifically, a successful change agent has empathy with the clients, is able to diagnose their needs and adequately addresses these needs, and influences a large number of adopters (Rogers, 1995).

Many of the change agencies for agricultural development were formed during the great depression of the 1930s, with the mission of bringing new information to farmers, helping them solve their problems and increasing agricultural production. These agencies included the Cooperative Extension Service (CES), the Soil Conservation Service (SCS), the Farmers Home Administration (FmHA), the Rural Electrification Administration (REA) and the Agricultural Stabilization and Conservation Service (ASCS). These agencies, along with the United States Department of Agriculture (USDA), the Agricultural Experiment Stations (AES), and the Farm Credit Administration (FCA), have as their main purpose to improve the lives of farmers, their families and communities in which they live by addressing their problems using innovative solutions (Rogers et al., 1988).

Two of these agencies operate through the land-grant colleges: the CES and the AES. The CES was designed to communicate and conduct educational programs with clients on farm and home innovations. The fact that this service is cooperatively funded by federal, state and county resources makes even more important the role of the county agent. The county agent is the linkage between farmers and the state and rational systems, and might be able to identify farmers' problems and address them with appropriate innovations. (Rogers et al, 1988). Their tools to accomplish this mission are
on-farm demonstrations, videotapes, seminars, newsletters and handouts (Richardson, 1989).

As stated by Rogers et al. (1988), until the beginning of this century farmers' face-to-face communication processes were adequate for providing them information they needed to run their farms. Economic factors that affected farmers, such as industrialization and the commercialization of agricultural products, were still under their control. With the growth of industrialized agriculture and interest groups, associations became the only way for farmers to protect themselves in legislative, economic and educational issues. Under the legislative function of the association, farmers organized pressure groups to influence legislation regarding issues of their concern. Within the economic function, the associations filled farmer's need for savings schemes, low cost supplies and even by organizing strikes to establish some of their assets. Within the educational function of the associations, the farmers could access innovative information to increase their productivity and economic power.

The role of Extension as a source of innovations for farmers has begun to fade to fade. For example, a 1986 study with Iowa farmers concerning their sources of information on sustainable agriculture practices showed that the most often cited sources were specialized mass media (e.g. farm magazines) and agricultural chemical dealers with, respectively, 83.1% and 72.5% of responses each (Alonge & Martin, 1992). The study concluded that although mass media was influential in creating a positive attitude toward changes in farming practices among farmers, these farmers wanted a closer and more personal contact to support these changes. Hence, the study concluded that there
was a need for the extension service to provide farmers with innovative information that would help them improve their farming practices and move, in this case, toward a more sustainable agriculture.

Another study conducted in 1988 with Iowa farmers facing severe erosion in their farms showed that their preferred sources of information about soil conservation were personal contacts, specifically neighbors and family members (Ganon et al., 1992). Those studies demonstrated that farmers' preferable way to communicate is interpersonal, hence clarifying that there is a niche for Extension professionals to act as innovation diffusion agents. Confirming the data above, a 1989 survey of Pennsylvania farmers sought to identify their preferred types of information source regarding environmental issues, found that these farmers rated higher personal contact educational activities, such as on-farm consultations, demonstrations, tours and plots (Bruening, 1991).

For farmers "seeing is believing." If Extension is willing to maintain its role in influencing the route of innovations in rural America, agents' communication skills must improve. It has to be willing to interact in a personal and demonstrative basis with farmers, and to share information rather than impose. If Extension is to continue to influence the diffusion of agricultural innovations, it has to adopt a participatory communication approach with farmers. Listening becomes an important skill for change agents.

**Extension and sustainable agriculture**

In 1890 the United States had 24.7 million Americans (42.3% of the population) living on 4.6 million farms with an average size of 137 acres, yielding a total of 623
million acres in production. In 1990 this picture had changed. There were only 3.9 million Americans (or 1.5% of the population) on the total of 2.14 million farms with an average size of 461 acres, and a total of 987 million acres in production (U.S. Department of Census, 1992). However, the movement toward large farms is showing signs of changing, as demonstrated in Chapter I. The number of farmers concerned with environmental effects of their farming practices is rapidly increasing, as well as the number of associations of organic and sustainable farmers. The dramatic growth that SA had in Europe and in the United States in the past five to ten years, was also demonstrated in Chapter I. A point was made about the radical economic effects that some of the industrial agriculture practices were having not only in the environment but also in the economy, causing farmers to shift to more long-term sustainable farming practices.

The Cooperative Extension System is challenged to better serve its clientele if it is to maintain its position as an innovation source for farmers, and as an agricultural pioneer. SA farmers represent a group which seeks Extension’s help in meeting their innovative information needs.

**Summary of this Chapter**

In summary, the literature review presented reflects the changing nature of U. S. agriculture and implications for Extension. Extension grew out of a need to help farmers solve their problems, and had been effective while the country’s agricultural trend was to increase production and farms size. Environmental concerns, however, today represent yet another area where farmers need help from Extension. Extension’s agents must embrace SA if they are to be useful to farmers like those in the IFO organization.
CHAPTER 3
METHODOLOGY

Population

Population refers to a group of people to whom the results of a study are intended to apply. It is composed of all the cases (units) or elements that conform to some designated set of specifications (Ary, Jacobs and Razavieh, 1990). When information is gathered from only a small number of the population, this small number is called a "sample". Under certain conditions, such as random selection, a sample can be considered a small replica of the population. In this study the population was members of the Innovative Farmers of Ohio (IFO) (N=120). A stratum is a subpopulation defined by one or more specifications that divides the population into mutually exclusive parts. This study investigated a stratum, that is, only those members of the IFO organization who are actively farming. This represents 58.8% of total IFO membership. All farmers were sent the survey. Hence, this study is a census of that stratum. It is neither a randomly selected sample representative of all Ohio farmers, nor of all IFO members.

A directory of IFO members was obtained from Jeff Dickinson, Ph.D., Director of The Stratford Ecological Center in Delaware, OH. Dickinson is also responsible for recruiting IFO members and fundraising for the organization. Dickinson identified those
members of IFO who were actually farmers. Farmers were defined as regular members of IFO whose primary source of income was from farming. This list was verified by Charles Eselgroth, president of IFO.

**Instrumentation**

Data for this study was collected using a 33-question survey instrument. A pilot test for validity was conducted using a panel of experts interested in SA, drawn from the Department of Agricultural Economics at The Ohio State University, OSU Extension Program Coordinators, and graduate students specializing in SA. The Cronbach-Alpha test for reliability was conducted by measuring internal consistency in the study's 10 main constructs. The following values for Alpha were obtained: (1) .75 for "land stewardship"; (2) .44 for "communication processes"; (3) .69 for "the aim of SA"; (4) .76 for "SA agricultural practices"; (5) .77 for "information sources"; (6) .76 for "agricultural media coverage"; (7) .56 for "reliability of sources of information"; (8) .55 for "motives for association"; (9) .83 for "training needs"; (10) .24 for "relationship with Extension".

The final questionnaire was presented to IFO president Charles Eselgroth for validation. Because of his involvement in the design of this study, Mr. Eselgroth did not participate in the study. A copy of the questionnaire is provided in Appendix A. There were seven parts to it:

**Section A**

This Section consisted of questions on land stewardship. It was designed to obtain information on IFO farmers' philosophical beliefs relative to environmentally sound farming practices, rural life, land grant research station activities, extension
performance, farmers’ sense of community and ethical concerns. The questions were designed in a Likert scale format with the following response categories: 1 (Not Subscribe) to 7 (Strongly Subscribe), 1 (Very Serious) to 5 (Definitely Not Serious), or 1 (Strongly Agree) to 4 (Strongly Disagree).

Section B:

Section B was designed to obtain information on sustainable agriculture innovative practices of IFO farmers. What type(s) of agricultural practices were these farmers engaged in that makes them a unique group? For example, were they practicing crop rotation? Were they interseeding? Were they practicing conservation tillage and crop residue management? Other follow-up questions helped to determine the sources of information about sustainable agriculture practices used by these farmers, and the characteristic of farmers who have or have not adopted these sustainable practices. Both multiple choice and Likert scale formats were used.

Section C:

This Section was aimed at determining where IFO farmers get information on SA, including information on sustainable products marketing. The farmers were asked to indicate their awareness of types of media which carry information on SA. They were also asked to indicate frequency of use of these media. This section also queried farmers about their views on coverage of SA news in popular media. The questions in this section were formatted as Likert scales with response categories of 1 (Use Very Often) to 4 (Never Use), or 1 (Strongly Disagree) to 4 (Strongly Agree).
Section D

Section D consisted of questions designed to gain a better understanding of IFO as a community of farmers. How was the organization managed? How were ideas initially conceived among members of IFO? How were decisions made? What was the level of member participation in the decision-making process? How, for example, did other institutions, such as Extension and OARDC, play a part in the IFO policy-making processes? These questions were stated in two ways. In the first way a multiple choice question was offered. In the second way it was used a Likert scale from 1 (Not Important) to 4 (Very Important).

Section E

Section E asked questions on farmers' training needs in SA practices. Farmers were asked to indicate their educational needs with respect to sustainable farming practices such as holistic or integrated resource management, marketing of agricultural products and the role of organic matter in SA production. The questions were formatted in a Likert-scale form, with possible answers ranging from 1 (Not Needed) to 5 (Highly Needed).

Section F

Section F sought to understand the need for Extension in SA. How do IFO farmers perceive the OSU Extension System? Did Extension impact these farmers? Did IFO farmers have a need for Extension? Were Extension agents actively involved in IFO decision-making? Did the Extension system serve as a major source of information for IFO farmers? The questions in this section were also designed on a Likert-scale format.
Section G

Section G was aimed at collecting demographic and situational data, such as farm size, types of farming activity, crops planted, crop rotation system, years in farming, place to market products, off-farm sources of income, and time devoted to farming. Open-ended questions were used, which gave respondents an opportunity to provide additional relevant information not addressed in other questions. The open-ended format was employed particularly to obtain information on seminars attended, crops planted, crop rotation systems, marketing farming products, off-farm sources of income, and number of family members working on the farm and on an off-farm job.

Data collection

Data for the study was collected using a mail questionnaire. The questionnaires were mailed on April 19, 1996, with a self-addressed stamped return envelope. A cover letter explaining the purpose of the study, and support for it by IFO President Charles Egelroth, was also enclosed. Sixty questionnaires (85.7%) were returned after two weeks. Reminder postcards were mailed twice. The first yielded eight questionnaires (11.4%), and the second brought in the remaining two questionnaires (2.8%). Thus, this study had a 100% response rate. This successful participation indicates that respondents found the study interesting and useful.

Data analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS-PC) statistics software. The data analysis had three parts: 1) The raw data was categorized into nominal and interval scales, summarized using descriptive statistics such
as frequencies, percentages, measures of central tendency and measures of dispersion; 2) comparisons were made in selected variables; and 3) sets of correlated data were analyzed and compared utilizing measures of association.

Responses to open-ended questions were tabulated to examine if there were common themes and opinions among the respondents. These data were later summarized as nominal data using descriptive statistics and measures of central tendency.
CHAPTER 4
FINDINGS AND DISCUSSION

In Chapter I, seven research objectives were identified: (1) to describe the demographic characteristics of the Innovative Farmers of Ohio (IFO); (2) to determine IFO farmers' philosophical beliefs on land stewardship and environmental sustainability; (3) to describe their sustainable agriculture (SA) practices; (4) to describe the nature of communication among IFO farmers; (5) to determine IFO farmers' sources of information on environmentally sound agricultural practices; (6) to describe IFO farmers' attitude toward Extension's ability to meet their needs; and (7) to examine implications of this study for agricultural communication and other researchers. This Chapter IV reports the findings to these research questions. To simplify reading, the findings are presented one objective at a time, followed by a general discussion of the findings.

Objective 1: To identify IFO farmers characteristics

IFO farmers are a group composed of 57 males (82%) of the population) and 12 females (17%). The average age of the farmers was 47.5 years (sd=12.2), with 34% between the ages of 41 to 50. Fifty percent of them had a college education and 20.9% have been to graduate school.
Nearly 70% of the respondents described themselves as full-time farmers, that is, dedicating at least 40 hours a week to farming. However, 40% said that they held non-farm jobs and another 50% said their spouses worked outside the farm as well.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size of farms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 acres or less - 250 acres</td>
<td>41</td>
<td>60.3</td>
</tr>
<tr>
<td>251 - 1,000 or more acres</td>
<td>17</td>
<td>39.7</td>
</tr>
<tr>
<td>No Answer</td>
<td>2</td>
<td>Missing</td>
</tr>
<tr>
<td><strong>Time devoted</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time</td>
<td>46</td>
<td>66.7</td>
</tr>
<tr>
<td>Part-time</td>
<td>23</td>
<td>33.3</td>
</tr>
<tr>
<td>No Answer</td>
<td>1</td>
<td>Missing</td>
</tr>
<tr>
<td><strong>Type of activity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain</td>
<td>46</td>
<td>70.8</td>
</tr>
<tr>
<td>Livestock</td>
<td>46</td>
<td>68.7</td>
</tr>
<tr>
<td>Vegetables</td>
<td>30</td>
<td>46.2</td>
</tr>
<tr>
<td>Fruits</td>
<td>16</td>
<td>24.6</td>
</tr>
<tr>
<td>Dairy</td>
<td>11</td>
<td>16.7</td>
</tr>
</tbody>
</table>

*The results do not equal 100% because the respondents were asked to check all the answers that apply.

Table 4.1: Size of farms, time devoted to farming and type of activity (N=70)
Thirty five percent of respondents owned farms of less than 100 acres, 25% had 100 to 250 acre-farms; and the remaining 12% had farms of 500 acres or more. IFO farmers’ main activity was producing grains (70%), followed by livestock (68%), vegetables (46%), fruits (24%), and dairy (16%). They produced mainly the following crops: corn (100% of the grain producers); wheat (63%); soybean (45%); other beans (39%); and oats (32%). More than half (57%) of the farmers had none or only one member of the family helping on the farm. Thirty percent indicated that 76% or more of the family income came from farming (See Table 4.1).

<table>
<thead>
<tr>
<th>Years in farming</th>
<th>f</th>
<th>%</th>
<th>Years in SA</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 years or less</td>
<td>18</td>
<td>26.1</td>
<td>1 - 10 years</td>
<td>40</td>
<td>61.5</td>
</tr>
<tr>
<td>11 - 20 years</td>
<td>21</td>
<td>30.4</td>
<td>11-20 years</td>
<td>19</td>
<td>29.2</td>
</tr>
<tr>
<td>21 - 30 years</td>
<td>15</td>
<td>21.7</td>
<td>21-30 years</td>
<td>4</td>
<td>6.1</td>
</tr>
<tr>
<td>31 years or more</td>
<td>15</td>
<td>21.7</td>
<td>31 + years</td>
<td>2</td>
<td>3.1</td>
</tr>
<tr>
<td>No answer</td>
<td>1</td>
<td>Missing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2: Years in farming and in sustainable agriculture (N=70)

In an open-ended question, IFO farmers were asked to indicate off-farm source of income: 33% said their spouses work; 30% said that they were self-employed as counselors/consultants, had portable sawmill, worked with residential and industrial maintenance, or had occasional remodeling/construction jobs. Twenty-three percent cited
retirement and pensions as their off-farm sources of income; 18% had interests on investments and properties; 13% were employed in construction, and 10% were teachers and 6% researchers. Nearly half of IFO farmers (43%) have been in farming for 21 years or more, and 61% had been practicing SA for 10 years or less.

<table>
<thead>
<tr>
<th>Places</th>
<th>f</th>
<th>%*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food industries</td>
<td>17</td>
<td>24.6</td>
</tr>
<tr>
<td>Farmers' markets</td>
<td>13</td>
<td>18.8</td>
</tr>
<tr>
<td>Local elevators</td>
<td>9</td>
<td>12.8</td>
</tr>
<tr>
<td>Direct to consumers</td>
<td>9</td>
<td>13.0</td>
</tr>
<tr>
<td>Friends</td>
<td>8</td>
<td>11.5</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>7</td>
<td>10.0</td>
</tr>
<tr>
<td>Community Support Agriculture (CSA)</td>
<td>7</td>
<td>9.0</td>
</tr>
<tr>
<td>Auction</td>
<td>7</td>
<td>10.0</td>
</tr>
<tr>
<td>Standard market</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td>Restaurants</td>
<td>6</td>
<td>8.6</td>
</tr>
<tr>
<td>Natural food stores</td>
<td>5</td>
<td>7.2</td>
</tr>
<tr>
<td>Private use</td>
<td>5</td>
<td>7.2</td>
</tr>
<tr>
<td>Local stores</td>
<td>4</td>
<td>5.7</td>
</tr>
<tr>
<td>Roadside sales</td>
<td>4</td>
<td>5.7</td>
</tr>
<tr>
<td>Livestock associations</td>
<td>4</td>
<td>5.7</td>
</tr>
<tr>
<td>Grain terminals</td>
<td>2</td>
<td>2.8</td>
</tr>
</tbody>
</table>

*Percentage does not equal 100% because each farmer cited more than one market outlet.

Table 4.3: Preferable places for IFO farmers to market their products (N=76)
In an open-ended question regarding places where IFO farmers marketed their products, 24% declared that they sold it to food industries, 18% at local elevators, and 18% at farmers markets (see Table 4.2). Ninety-eight percent of the respondents answered the open-ended question designed to assess the place where IFO farmers preferred to market their products. They included: food industries (24% of answers); farmers markets (18%); local elevators (12%); direct to consumers (13%); and to friends (11%) [See Table 4.3].

Objective 2: To determine IFO farmers' philosophical beliefs on land stewardship and environmental sustainability

IFO farmers' philosophical beliefs were measured with a Likert scale ranging from 1 (Not Subscribe) to 7 (Strongly Subscribe). The five most strongly subscribed philosophical statements concerning land stewardship were: support for ecologically sound farming policies (Mean=6.64, Sd.=.97); promoting SA practices (Mean=6.57, Sd.=1.01); SA does not mean lowering profits (Mean=6.13, Sd.=.29); sustainability is more important than short-term maximum returns (Mean=6.13, Sd.=.32); and SA places emphasis on biological systems, input efficiency and optimal yields (Mean=6.05, Sd=1.13) [See Table 4.4]. Concerning the aim of SA, IFO farmers' philosophical beliefs were measured using a Likert scale ranging 1 (Strongly Agree) to 4 (Strongly Disagree). The statements which ranked higher were: SA aims at promoting and sustaining healthy rural communities (Mean=1.40, Sd.=.52); SA aims at fostering an ethical approach to land stewardship and humane treatment of farm animals (Mean=1.52, Sd.=.55); and SA aims at educating the public to value safe and healthy food (Mean=1.60, Sd.=.71). IFO
<table>
<thead>
<tr>
<th>Statements</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ecological policies should be supported</td>
<td>6.64</td>
<td>.97</td>
</tr>
<tr>
<td>2. Sustainable agricultural practices should be promoted</td>
<td>6.57</td>
<td>1.01</td>
</tr>
<tr>
<td>3. SA doesn’t mean lowering profits</td>
<td>6.13</td>
<td>1.29</td>
</tr>
<tr>
<td>4. Sustainability is more important than returns</td>
<td>6.07</td>
<td>1.32</td>
</tr>
<tr>
<td>5. SA emphasizes bio systems</td>
<td>6.05</td>
<td>1.13</td>
</tr>
<tr>
<td>6. Quality of life should not be sacrificed for productivity</td>
<td>5.95</td>
<td>1.53</td>
</tr>
<tr>
<td>7. It is possible to keep yields with no chemicals</td>
<td>5.57</td>
<td>1.42</td>
</tr>
<tr>
<td>8. SA employs more science</td>
<td>4.85</td>
<td>1.73</td>
</tr>
<tr>
<td>9. SA goal is to protect the environment</td>
<td>4.59</td>
<td>1.68</td>
</tr>
</tbody>
</table>

Likert Scale: 1=Not Subscribe to 7=Strongly Subscribe

Table 4.4: Farmers' philosophical beliefs regarding land stewardship (N=70)

farmers are conscious of the environment and at the same time they are motivated by profits. As one of them stated, "Agriculture is only sustainable if it is profitable."

(Appendix E)

Objective 3: To determine sustainable agricultural practices in use by IFO farmers

IFO farmers were asked two types of questions: 1) the extent to which they were currently using suggested SA practices; and 2) the innovative practices they were using to deal with soil erosion. The five SA practices used were: 1) low input use of chemicals (Mean=1.24, SD=.66); 2) use of cover crop (Mean=1.41, SD=.70); 3) conservation tillage and crop residue (Mean=1.56, SD=.98); 4) organic farming (Mean=1.74, SD=.81); and 5) farm enterprise diversification (Mean=1.94, SD=1.12).
Other practices that IFO farmers said they would use were: 1) integrated pest management (Mean=2.06, Sd.=1.11); 2) interseeding (Mean=2.06, Sd.=1.07); 3) intensive grazing systems (Mean=2.20, Sd.=1.66); and 4) no till (Mean=2.36, Sd.=1.09).

Only 18.5% of respondents cited SA practices other than the ones mentioned in the question. These practices were: 1) manure composting; 2) holistic resource management; 3) low input fertilizers; 4) flame weeding; and 5) ridge tillage (See Table 4.5).

<table>
<thead>
<tr>
<th>Practices</th>
<th>Mean</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low input use of chemicals</td>
<td>1.24</td>
<td>.66</td>
</tr>
<tr>
<td>Use of cover crop</td>
<td>1.41</td>
<td>.70</td>
</tr>
<tr>
<td>Conservation tillage and crop residue</td>
<td>1.56</td>
<td>.98</td>
</tr>
<tr>
<td>Organic flaming</td>
<td>1.74</td>
<td>1.01</td>
</tr>
<tr>
<td>Farm enterprise diversification</td>
<td>1.94</td>
<td>1.12</td>
</tr>
<tr>
<td>Integrated pest management</td>
<td>2.06</td>
<td>1.11</td>
</tr>
<tr>
<td>Interseeding</td>
<td>2.06</td>
<td>1.07</td>
</tr>
<tr>
<td>Intensive grazing systems</td>
<td>2.20</td>
<td>1.06</td>
</tr>
<tr>
<td>No till</td>
<td>2.36</td>
<td>1.09</td>
</tr>
</tbody>
</table>

Likert Scale 1=Currently Uses and 4=Don’t Know

Table 4.5: SA practices IFO farmers use or plan to use (N=70)

Sixty-two percent of respondents said that they had a little erosion problem on their farms. The most commonly mentioned erosion control method was crop rotation, cited by 80% of the farmers, followed by cover crops (65%), grassed waterways (53%) and forages (43%) [See Table 4.6].
<table>
<thead>
<tr>
<th>Erosion/Practices</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil erosion problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td>15</td>
<td>21.7</td>
</tr>
<tr>
<td>A little</td>
<td>44</td>
<td>63.8</td>
</tr>
<tr>
<td>Some</td>
<td>8</td>
<td>11.5</td>
</tr>
<tr>
<td>A lot</td>
<td>1</td>
<td>1.4</td>
</tr>
<tr>
<td>No answer</td>
<td>2</td>
<td>Missing</td>
</tr>
<tr>
<td>Soil Erosion Control Methods*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creep rotation</td>
<td>52</td>
<td>80.0</td>
</tr>
<tr>
<td>Cover crops</td>
<td>44</td>
<td>67.7</td>
</tr>
<tr>
<td>Grassed waterways</td>
<td>35</td>
<td>53.8</td>
</tr>
<tr>
<td>Forages</td>
<td>28</td>
<td>43.1</td>
</tr>
<tr>
<td>Reduced tillage</td>
<td>23</td>
<td>35.4</td>
</tr>
<tr>
<td>Conservation tillage</td>
<td>21</td>
<td>32.3</td>
</tr>
<tr>
<td>No till</td>
<td>20</td>
<td>30.8</td>
</tr>
<tr>
<td>Biological weed control</td>
<td>12</td>
<td>18.5</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>11.5</td>
</tr>
<tr>
<td>Ridge tillage</td>
<td>7</td>
<td>10.8</td>
</tr>
</tbody>
</table>

*Percentage does not equal 100% because respondents were asked to check all answers that applied.

Table 4.6: Erosion among SA farmers and ways they deal with erosion’s problems (N=70)

Objective 4: To describe the nature of communication among IFO farmers

IFO farmers like to communicate with peers and the general public by attending association meetings. They also prefer to associate with neighbors in order to share information and to gain knowledge about SA practices. Credibility is a very important
factor for IFO farmers. They like to share information, that is, to mutually communicate, and not to simply be handed information in a top down fashion. The results showed that IFO farmers belong to associations where they can get together to share valuable information on SA practices. This was one of the main reasons cited for belonging to organizations. On a Likert scale ranging from 1 (Not Important) to 4 (Very Important), farmers were asked to indicate why they belonged to SA organizations: 1) to promote the cause of SA was the first most important ranked statement (Mean=3.42, Sd=.65); 2) to learn about new SA practices (Mean=3.36, Sd=.73); 3) to benefit from cooperative efforts (Mean=3.20, Sd=.68); and 4) to increase profit margin (Mean=2.95, Sd=.99). The least cited motive was to gain access to insurance (Mean=3.86, Sd=.39) [See Table 4.7].

<table>
<thead>
<tr>
<th>Motives</th>
<th>Mean</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>To promote the SA cause</td>
<td>3.42</td>
<td>.65</td>
</tr>
<tr>
<td>To learn about new SA practices</td>
<td>3.36</td>
<td>.73</td>
</tr>
<tr>
<td>To benefit from cooperative efforts</td>
<td>3.20</td>
<td>.68</td>
</tr>
<tr>
<td>To increase profit margin</td>
<td>2.95</td>
<td>.99</td>
</tr>
<tr>
<td>To influence public policy</td>
<td>2.81</td>
<td>.96</td>
</tr>
<tr>
<td>For a sense of community</td>
<td>2.81</td>
<td>1.01</td>
</tr>
<tr>
<td>To have political influence</td>
<td>2.48</td>
<td>.95</td>
</tr>
<tr>
<td>For fun</td>
<td>2.40</td>
<td>1.03</td>
</tr>
<tr>
<td>To gain access to insurance</td>
<td>1.49</td>
<td>.88</td>
</tr>
<tr>
<td>Other (n=7)</td>
<td>3.86</td>
<td>.39</td>
</tr>
</tbody>
</table>

Likert Scale 1=Not important to 4=Very Important

Table 4.7: Why IFO farmers belong to associations (N=70)
IFO farmers wanted to be active participants in the communication processes of sharing information about SA. They like to share information not only with peers but also with the general public. They also would like to have a better communication interaction with other researchers in order to exchange information on SA.

IFO farmers' willingness to participate in communication processes was measured using a Likert scale ranging from 1 (Strongly Agree) to 4 (Strongly Disagree) on six statements. Respondents strongly agreed that: 1) they have a wealth of information to share with other farmers, researchers and extension workers (Mean=1.69, Sd.=.60); 2) they are willing to give interviews to reporters about their experiences (Mean=1.94, Sd.=.48); and 3) they have few outlets to share economically important SA aspects with others (Mean=2.12, Sd.=.67).

<table>
<thead>
<tr>
<th>SA farmers...</th>
<th>Mean</th>
<th>Sd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>... have information to share</td>
<td>1.69</td>
<td>.60</td>
</tr>
<tr>
<td>... are willing to give interviews on their experiences</td>
<td>1.94</td>
<td>.48</td>
</tr>
<tr>
<td>... have few outlets to share ideas with others.</td>
<td>2.12</td>
<td>.67</td>
</tr>
<tr>
<td>... are willing to hold on-farm tours to share experiences</td>
<td>2.18</td>
<td>.80</td>
</tr>
<tr>
<td>... would like Extension/research to help them with on-farm experiments</td>
<td>2.29</td>
<td>.84</td>
</tr>
<tr>
<td>... are satisfied with recommendations from experiment stations</td>
<td>3.03</td>
<td>.74</td>
</tr>
</tbody>
</table>

Likert Scale 1=Strongly Agree to 4=Strongly Disagree

Table 4.8: IFO farmers' communication activities and needs (N=70)
IFO farmers: 1) are willing to hold on-farm tours to share knowledge from their experiences (Mean=2.18, Sd.=.80); 2) would like to have Extension/research experts help them conduct on-farm research (Mean=2.29, Sd.=.84); and 3) are not satisfied with recommendations from state experimental stations (Mean=3.03, Sd.=.74) [See Table 4.8].

Credibility is important to communication effectiveness (Severin & Tarkard, 1992). IFO farmers were asked to indicate the level of credibility of their sources of SA information. A Likert scale 1 (Not Credible) to 5 (Very Highly Credible) was used. Information from The Practical Farmers of Iowa organization was perceived as the most reliable information about SA (Mean=3.68, Sd.=.97), followed by information from other members of IFO (Mean=3.66, Sd.=.90), from the Rodale Research Center (Mean=3.55, Sd.=.96), from the Ohio Ecological Food and Farmers Association (OEFFA) (Mean=3.45, Sd.=1.03), and from neighboring farmers (Mean=3.31, Sd.=1.06). Nine farmers (15%) listed “other information sources” for their SA practices. Those sources included Acres USA, Attra, successful biological farming consultants, and Bio Dynamic Quarterly Newsletter (See Table 4.9).

Membership in groups is an indicator of a farmers’ access to new ideas and practices. Groups also offers social support for adoption of new practices. To which groups do IFO farmers belong to? OEFFA got the highest rating (62.0%), followed by Farm Bureau (41.4%), and farmer cooperatives (25.7%). Other organizations to which IFO farmers belong are the Ohio Crop Improvement Association (OCIA) and churches (See Table 4.10).
<table>
<thead>
<tr>
<th>Sources</th>
<th>Mean</th>
<th>Std</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical Farmers of Iowa</td>
<td>3.68</td>
<td>.97</td>
</tr>
<tr>
<td>Other members of IFO</td>
<td>3.66</td>
<td>.90</td>
</tr>
<tr>
<td>Rodale Research Center</td>
<td>3.55</td>
<td>.96</td>
</tr>
<tr>
<td>OEFFA</td>
<td>3.45</td>
<td>1.03</td>
</tr>
<tr>
<td>Neighboring farmers</td>
<td>3.31</td>
<td>1.06</td>
</tr>
<tr>
<td>OARDC researchers</td>
<td>2.92</td>
<td>1.05</td>
</tr>
<tr>
<td>University Experiment Stations</td>
<td>2.68</td>
<td>.97</td>
</tr>
<tr>
<td>OSU Extension*</td>
<td>2.65</td>
<td>1.00</td>
</tr>
<tr>
<td>Ohio Farmers Union</td>
<td>2.60</td>
<td>1.10</td>
</tr>
<tr>
<td>Ohio Department of Agriculture</td>
<td>2.27</td>
<td>.94</td>
</tr>
<tr>
<td>Ohio Farm Bureau</td>
<td>2.06</td>
<td>.90</td>
</tr>
<tr>
<td>Other (n=9)</td>
<td>3.78</td>
<td>1.48</td>
</tr>
</tbody>
</table>

Likert Scale 1= Not Credible to 5=Very Highly Credible
* Rated relatively low

Table 4.9: Sources of innovations for IFO farmers (N=70)

Objective 5: To determine IFO sources of information on environmentally sound agricultural practices

IFO farmers were aware of the existence of several ways to obtain information to run their farms, but did not use all of them on a regular basis. They had a high level of awareness regarding the following sources of information: IFO Newsletter (94%); their own experience (93%); OEFFA Newsletter (88%); educational programs offered by
<table>
<thead>
<tr>
<th>Organizations</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEFFA</td>
<td>44</td>
<td>62.9</td>
</tr>
<tr>
<td>Farms Bureau</td>
<td>29</td>
<td>41.4</td>
</tr>
<tr>
<td>Other</td>
<td>23</td>
<td>33.3</td>
</tr>
<tr>
<td>Farmers cooperatives</td>
<td>18</td>
<td>25.7</td>
</tr>
<tr>
<td>Civic</td>
<td>6</td>
<td>8.7</td>
</tr>
<tr>
<td>Corn Growers Association</td>
<td>5</td>
<td>7.1</td>
</tr>
<tr>
<td>Farmers Union</td>
<td>5</td>
<td>7.1</td>
</tr>
<tr>
<td>Soybean Association</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>National Cattlemen</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Pork Producers</td>
<td>2</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Percentage does not equal 100% because farmers were asked to check all answers that applied.

Table 4.10: Organizations to which IFO farmers belong (N=70)

Extension (88%); and The Ohio Farmer (85%). Despite their awareness of informational media, however, IFO farmers rely mainly on their own experiences (Mean=1.12, Sd.=.45). Mean scores for other information sources were: OEFFA Newsletter (Mean=1.85, Sd.=.81); IFO Newsletter (Mean=2.22, Sd.=.86); educational programs offered by non-profit organizations (Mean=2.36, Sd.=1.04); educational programs offered by Extension (Mean=2.57, Sd.=.95); the Attra Newsletter (Mean=2.68, Sd.=1.20); and the newsletter of The Ohio Farmer (Mean=2.75, Sd.=1.08) [See Tables 4.11 and 4.12].

Also aiming at obtaining more information on SA farming practices, 80% of the respondents said that they attended seminars and workshops promoted by private
<table>
<thead>
<tr>
<th>Promoting organizations</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEFFA</td>
<td>27</td>
<td>48.2</td>
</tr>
<tr>
<td>IFO</td>
<td>22</td>
<td>39.2</td>
</tr>
<tr>
<td>Farm Tours</td>
<td>11</td>
<td>19.6</td>
</tr>
<tr>
<td>HRM</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>OCIA</td>
<td>5</td>
<td>8.9</td>
</tr>
<tr>
<td>Other Universities</td>
<td>3</td>
<td>5.3</td>
</tr>
<tr>
<td>OSU</td>
<td>2</td>
<td>3.5</td>
</tr>
<tr>
<td>Various private organizations*</td>
<td>29</td>
<td>51.7</td>
</tr>
</tbody>
</table>

Total does not equal 100 because the respondents were asked to cite up to five attended workshops and seminars.
* Listed as “Others”

Table 4.11: Workshops & seminars IFO farmers attended (N=70)

Institutions. Seminars promoted by the Ohio Ecological Food and Farmers Association (OEFFA) were cited in 48% of the responses, and IFO’s seminars were mentioned in 39% of the responses. “Others institutions” were cited in 51% of the responses, and they were Holistic Resource Management (HRM), 16%; Organic Crop Improvement Association (OCIA), 9%; Acres USA, 7%; universities other than the Ohio State University (OSU), 5%; and seminars promoted by OSU, 3%.

IFO farmers expressed concern about information channels and SA coverage.

Their views about popular media and agricultural press coverage of SA issues were measured using a Likert scale 1 (Strongly Disagree) to 4 (Strongly Agree) on six
<table>
<thead>
<tr>
<th>Information Sources</th>
<th>Aware (%)</th>
<th>Not Aware (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFO Newsletter</td>
<td>94.2</td>
<td>5.8</td>
</tr>
<tr>
<td>My own experience</td>
<td>93.5</td>
<td>6.5</td>
</tr>
<tr>
<td>OEFFA Newsletter</td>
<td>88.4</td>
<td>11.6</td>
</tr>
<tr>
<td>Educational programs by Extension</td>
<td>88.1</td>
<td>11.9</td>
</tr>
<tr>
<td>The Ohio Farmer</td>
<td>85.3</td>
<td>14.7</td>
</tr>
<tr>
<td>Internet/computers</td>
<td>79.1</td>
<td>20.9</td>
</tr>
<tr>
<td>On-farm visit by Extension agents</td>
<td>75.6</td>
<td>25.0</td>
</tr>
<tr>
<td>Educational programs by non-profit organizations</td>
<td>74.2</td>
<td>25.8</td>
</tr>
<tr>
<td>Educational programs by agribusiness</td>
<td>65.7</td>
<td>34.3</td>
</tr>
<tr>
<td>Ohio’s Country Journal</td>
<td>61.2</td>
<td>38.8</td>
</tr>
<tr>
<td>Attra News</td>
<td>47.8</td>
<td>52.2</td>
</tr>
<tr>
<td>Journal of Soil &amp; Water Conservation</td>
<td>31.3</td>
<td>68.7</td>
</tr>
<tr>
<td>Land Stewardship Newsletter</td>
<td>28.4</td>
<td>71.6</td>
</tr>
<tr>
<td>Journal of SA</td>
<td>19.1</td>
<td>80.9</td>
</tr>
<tr>
<td>American Journal of Altern. Agric.</td>
<td>16.7</td>
<td>83.3</td>
</tr>
<tr>
<td>Other (f=21)</td>
<td>90.5</td>
<td>9.5</td>
</tr>
</tbody>
</table>

* Likert Scale 1=Use Very Often to 4=Never Use

Table 4.12: IFO farmers’ awareness of SA information sources (N=70)

statements. They were also given the opportunity to express individual concerns through filling the lines on the questionnaire for “Others”. IFO farmers did not feel that media coverage of SA practices was adequate (Mean=1.63, Sd.=.62). They also felt that popular media hardly portrayed any positive image of agriculture (Mean=2.28, Sd.=.73).
The media were considered even less favorable of alternative agricultural practices (Mean=2.28, Sd.=.79). However, results indicated that IFO farmers found agricultural press giving attention to alternative agriculture practices. They were also satisfied with the number of publications carrying information on sustainable farm practices (Mean=2.28, Sd.=.60). IFO farmers agreed that the agricultural press in unduly influenced by the agribusiness industry (Mean=3.56, Sd.=.62) [See Table 4.13].

<table>
<thead>
<tr>
<th>Statements</th>
<th>Mean</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media coverage of SA is adequate</td>
<td>1.63</td>
<td>.62</td>
</tr>
<tr>
<td>Agricultural press is influenced by agribusiness industry</td>
<td>3.56</td>
<td>.68</td>
</tr>
<tr>
<td>Agricultural press gives little attention to alternative issues</td>
<td>2.89</td>
<td>.69</td>
</tr>
<tr>
<td>Popular media has positive attitude toward alternative agriculture</td>
<td>2.28</td>
<td>.79</td>
</tr>
<tr>
<td>Popular media has positive image of agriculture</td>
<td>2.28</td>
<td>.73</td>
</tr>
<tr>
<td>There are few publications on sustainable farming practices</td>
<td>2.92</td>
<td>.60</td>
</tr>
<tr>
<td>Other (n=5)</td>
<td>3.80</td>
<td>.45</td>
</tr>
</tbody>
</table>

Table 4.13: IFO farmers opinion about information channels (N=70)

Five farmers (7.14%) expressed their own statements regarding attention given to SA issues in the press. The statements were as follows: “Only when a negative occurrence happens do you see major TV or press paying attention to SA”; “There is a vast unfilled market for better coverage of sustainable practices”; “All mainstream colleges and publications always put sustainable farming as if it cannot be for everyone
and leaves a cloud of doubt’; and “Positive documentation of successful alternative agricultural products has existed for many decades” (See Table 4.14).

<table>
<thead>
<tr>
<th>Source</th>
<th>Mean</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>My own experience</td>
<td>1.12</td>
<td>.45</td>
</tr>
<tr>
<td>OEFFA Newsletter</td>
<td>1.85</td>
<td>.81</td>
</tr>
<tr>
<td>IFO Newsletter</td>
<td>2.22</td>
<td>.86</td>
</tr>
<tr>
<td>Educational programs by non-profit organizations</td>
<td>2.36</td>
<td>1.04</td>
</tr>
<tr>
<td>Educational programs by Extension</td>
<td>2.57</td>
<td>.95</td>
</tr>
<tr>
<td>Attna News</td>
<td>2.68</td>
<td>1.20</td>
</tr>
<tr>
<td>The Ohio Farmer</td>
<td>2.75</td>
<td>1.08</td>
</tr>
<tr>
<td>Ohio’s Country Journal</td>
<td>3.03</td>
<td>1.04</td>
</tr>
<tr>
<td>On-farm visit by Extension agents</td>
<td>3.05</td>
<td>.93</td>
</tr>
<tr>
<td>Internet/computers</td>
<td>3.08</td>
<td>1.10</td>
</tr>
<tr>
<td>Educational programs by agribusiness</td>
<td>3.13</td>
<td>.89</td>
</tr>
<tr>
<td>Land Stewardship Newsletter</td>
<td>3.33</td>
<td>.95</td>
</tr>
<tr>
<td>American Journal of Alternative Agriculture</td>
<td>3.62</td>
<td>.79</td>
</tr>
<tr>
<td>Journal of SA</td>
<td>3.63</td>
<td>.72</td>
</tr>
<tr>
<td>Other (F=20)</td>
<td>1.35</td>
<td>.81</td>
</tr>
</tbody>
</table>

Likert Scale 1 (=Use Very Often) to 4 (=Never Use)

Table 4.14: Farmers use of information sources (N=70)

Objective 6: To describe IFO farmers’ attitude toward Extension

IFO farmers’ attitude toward Extension was measured using a Likert scale with values ranging from 1 (Strongly Agree) to 4 (Strongly Disagree). Here were six statements concerning Extension’s support of SA and IFO organization. The farmers
agreed that Extension agents could do more to help them in alternative agriculture (Mean=1.54, Sd.=.66). They also agreed that until recently many Extension agents had a negative attitude toward SA practices (Mean=1.63, Sd.=.69).

IFO farmers said that the government should strengthen regulations on the use of chemicals with farm animals (Mean=2.13, Sd.=.99), and that the government should also strengthen regulations on the use of farm chemicals and pesticides on crops (Mean=2.23, Sd.=1.00).

IFO farmers disagreed that Extension agents’ attitudes are changing for the better in terms of supporting SA (Mean=2.38, Sd.=.70). They also did not feel that the Ohio Department of Agriculture is supportive of SA practices (Mean=3.17, Sd.=.69) [See Table 4.15].

<table>
<thead>
<tr>
<th>Statements</th>
<th>Mean</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension agents can do more to help SA farmers</td>
<td>1.54</td>
<td>.66</td>
</tr>
<tr>
<td>Extension agents have negative attitude toward SA practices</td>
<td>1.63</td>
<td>.69</td>
</tr>
<tr>
<td>Use of chemicals with farm animals should be restricted</td>
<td>2.13</td>
<td>.99</td>
</tr>
<tr>
<td>Use of chemicals and pesticides on crops should be restricted</td>
<td>2.23</td>
<td>1.00</td>
</tr>
<tr>
<td>Extension agents’ attitude with SA is changing for better</td>
<td>2.38</td>
<td>.70</td>
</tr>
<tr>
<td>ODA is fully supportive of SA practices</td>
<td>3.17</td>
<td>.69</td>
</tr>
</tbody>
</table>

Likert Scale 1=Strongly Agree to 4=Strongly Disagree

Table 4.15: IFO farmers’ opinion regarding their relationship with Extension (N=70)
The correlation coefficients Pearson r was calculated in this section to assess the relationship between age, education, size of the farm, years in farming, years in SA, SA practices and training needs, with reliance and use of Extension information and on-farm visits. There were low negative correlations between the reliance/use of Extension services and age (average of -0.24), education (average of -0.17), years in farming (average of -0.11) and in years in SA (average of -0.9). This result demonstrates that older, more educated and experienced IFO farmers get, the less they rely on Extension services.

There was also a low negative correlation between size of farms and use of Extension services (average of -0.22), demonstrating that the larger the farm is, the lesser the farmer use Extension services. It also shows that smaller farmers might need more, or be more inclined to use Extension services/information.

Other low negative correlations were found between use and reliance on Extension and: 1) extent to which farmers use SA practices (-0.31); 2) strong philosophical beliefs in the environmental protection aspect of SA (average of -0.13); and 3) needs for training (average of -0.19). These results indicate that the more involved farmers are with SA the less they approach/rely on Extension services/information.

Objective 7: To examine implications of this study for agricultural communication and other researchers

This study addressed several communication and information needs of IFO farmers, as well as socio-economic, educational and diversity aspects. There are five main implications of this study for agricultural communication researchers, and two
implications for researchers of other areas such as rural sociology, diversity, needs assessment and strategic planning.

First, there is a need to improve the flow of information between the Extension service and its agents, and IFO farmers. Almost 70% of IFO farmers rarely used or never used Extension agent’s information, 88% agreed that Extension agent’s have a negative attitude toward SA, and 94% agreed that these agents could do more to help the SA cause. This study also asked farmers to indicate areas they needed training as a way of improving productivity. Some of the training needs indicated by IFO farmers are already the focus of some of the Ohio State University Extension programs, indicating again that there is a communication gap between Extension and part of its clientele such as IFO farmers. How to market agricultural products, for example, was ranked by IFO farmers as their highest educational need (Mean=4.10, Sd.=.97); followed by weed management in ecological agriculture (Mean=4.09, Sd.=.93); soil fertility management (Mean=3.91, Sd.=1.03); role of organic matter in crop production (Mean=3.90, Sd=1.08); pest control (Mean=3.64, Sd.=1.21); holistic or integrated resource management (Mean=3.51, Sd.=1.13); tillage practices (Mean=3.42, Sd.=1.20); soil conservation (Mean=3.18, Sd.=1.27); finance management (Mean=3.06, Sd.=1.06); grazing (seasonal and rotational) (Mean=3.01, Sd.=1.20); and research design (Mean=3.01, Sd.=1.20) [See Table 4.15].
<table>
<thead>
<tr>
<th>Topics</th>
<th>Mean</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing of agricultural products</td>
<td>4.10</td>
<td>.97</td>
</tr>
<tr>
<td>Weed management in ecological agriculture</td>
<td>4.09</td>
<td>.93</td>
</tr>
<tr>
<td>Soil fertility management</td>
<td>3.91</td>
<td>1.03</td>
</tr>
<tr>
<td>Role of organic matter in crop production</td>
<td>3.90</td>
<td>1.08</td>
</tr>
<tr>
<td>Pest control</td>
<td>3.64</td>
<td>1.21</td>
</tr>
<tr>
<td>Holistic or integrated resource management</td>
<td>3.51</td>
<td>1.13</td>
</tr>
<tr>
<td>Tillage practices</td>
<td>3.42</td>
<td>1.20</td>
</tr>
<tr>
<td>Soil conservation</td>
<td>3.18</td>
<td>1.27</td>
</tr>
<tr>
<td>Finance management</td>
<td>3.06</td>
<td>1.06</td>
</tr>
<tr>
<td>Grazing (seasonal and rotational)</td>
<td>3.01</td>
<td>1.42</td>
</tr>
<tr>
<td>Research design</td>
<td>3.01</td>
<td>1.20</td>
</tr>
<tr>
<td>Other (f=8)</td>
<td>5.00</td>
<td>.00</td>
</tr>
</tbody>
</table>

Likert Scale 1=Not Needed to 5=Highly Needed

Table 4.16: IFO farmers’ expressed training needs (N=70)

The OSU Extension’s sustainable agriculture program, for example, created in 1990, addresses farmers’ need for more environmentally friendly farming practices. The program on watershed education, for example, was designed to empower farmers to make sound environmental management decisions. “Precision” or “Site Specific” is another educational program that apply research with farmers by setting up field grids and determining soil nutrient variation. The Integrated Pest Management Program (IPM) as well as the Integrated Crop Management (ICM) address farmers and general public
concerns about food safety regarding pesticides, herbicides and nutrients use. The Low Level Radioactive Waste Education developed by the OSU Extension Community Development Program provides information and education on waste management. Some of the management topics requested by IFO farmers, such as creative problem solving and farm management, are addressed by Project Excel, an OSU Extension initiative created to develop existing and emerging local government leaders in small and mid-sized communities (OSU Extension Annual Report, 1995). The communication gap between these two groups is undeniable. IFO farmers are not completely relying on Extension to obtain information they need on SA, but depending on their own experience (91%), their peer’s experience (80%), their own organization IFO (91%), or on OEFFA (85%). IFO farmers like to learn about SA innovative practices and to share their ideas with people and organizations whom they trust: their family, their peers, their organization. Why they are not completely relying on Extension’s information? That question must be addressed by further studies.

Second, there is a need to improve the flow of information between state experimental stations and SA farmers. Almost 80% of IFO farmers agreed that they were not satisfied with the recommendations coming from experimental stations, although 57% found their information reliable. On the same time, 85% of IFO farmers declared that they would like to conduct their own research with the help of Extension/research experts. Over 92% of them would like to share their information with other farmers, researchers and Extension workers. These results let it clear that IFO farmers want researchers to help in a participatory way, i.e., in a way that shares information and
respect their ideas and philosophical beliefs. There is a clear need for agricultural communication researchers and professionals to develop an effective connection between SA farmers, research experimental stations and the Extension service.

A third implication for agricultural communication researchers and professionals is related with the training needed by Extension agents in order to effectively address IFO farmers. IFO farmers are willing to share their information (74%) and their knowledge in on-farm tours (71%), as 94% of them agreed that expanding opportunities for other farmers to make the transition is one of the aims of SA. Over 94% of IFO farmers are willing to discover alternative approaches to expand knowledge and access to SA. Therefore, what is missing in the relationship between Extension agents and IFO farmers is professional communication training, that could be done whether by in-service programs or by a long-term education such as graduate degrees. In this case, a whole new curriculum approach should be developed by agricultural communication researchers to address specific needs of the SA farmers population.

A fourth implication for agricultural communication professionals regards the study of the innovative communication processes between SA farmers. It was revealed in this study that over 97% of IFO farmers contact their peers and learn about new practices during their farmer’s organizations and associations meetings. IFO farmers graded with high credibility all the information they get from members of these organizations (average mean of 3.6 in a Likert Scale 1= Not credible to 5=Very highly credible). Over 92% of them demonstrated willingness of sharing their knowledge with other farmers, and over 70% would hold on-farm tours to accomplish this mission. However, 74% of
IFO farmers were concerned that they had few outlets to expand their SA ideas with other farmers. This fact brings the need for agricultural communicators professionals and researchers to study and further understand the communication patterns that allow diffusion of an innovation, such as SA, within a group of farmers that is managing to survive with a different farming style in the U. S. traditional agricultural setting.

A fifth implication of this study for agricultural communication researchers regards the flow of information between IFO farmers and the general public. Ninety percent of IFO farmers are not satisfied with the media coverage on SA issues, and over 72% think that agricultural press gives little attention to the topic. Almost 80% agreed that there are few publications on SA farming, and over 92% agreed that agricultural press is influenced by the agribusiness industry. Therefore, communication researchers and professionals are needed in the investigation on effective ways to diffuse SA ideas among other farmers and the general public. These professionals are needed in three fronts: first, in the general media, to bring attention to SA issues; second, in the specialized media, to adequately address SA farming issues; and third, in the editorial market to expand the number of publications on the topic.

Other implication of this study for researchers is regarding the ability of Extension in dealing with the diversity of its clientele. The results of this study demonstrated that IFO farmers characteristics match with the characteristics of innovators as described by Rogers (1995). As innovators, IFO farmers are well educated (over 80% had a college education), expand their circle of information beyond the local level (almost 100% belong to local and national farmers organizations other than IFO), are obsessive in
searching for new ideas (over 83% declared having attended workshops and seminars to learn about SA), and have their circle of friends outside the local group (only 10% of the people IFO farmers talk in a regular basis is related with agricultural issues and practices). To appropriately address this innovators group, IFO, Extension workers need to be trained in specific communication approaches and specially in a more participatory way. As innovators, IFO farmers will be more willing to communicate in a participatory way, through interactions with Extension agents or directly with researchers. The first step for this approach is to conduct a needs assessment which requires: 1) the group identification, through face-to-face interaction or survey questionnaires such as the present study; 2) determining their communication and information patterns; and 3) determining what kind of information do these farmers want Extension agents to provide for them.

Another implication of this study for researchers regards strategic planning. Still accordingly to Rogers (1995), innovators will influence only early adopters, which will influence, later on, the rest of the population in adopting an innovation. In fact, over 90% of IFO farmers see themselves as promoters of the SA cause, and over 80% of them aspire some political influence. How could Extension take advantage of IFO to maintain its role as a change agent in the U.S. agricultural setting? By supporting groups such as IFO in their innovative SA initiatives, Extension would be part of the process of implementing a new set of agricultural practices that might drastically affect the country in the future.
No matter the efforts that the OSU Extension System is doing to serve all farmers in Ohio, the results of this study showed clearly that the majority of this group of SA farmers, the IFO farmers, are not satisfied. Accordingly to IFO farmers, there is a gap between their needs and Extension’s ability to satisfy those needs.
CHAPTER 5
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Overview of the study

In general, this study sought to better understand the Innovative Farmers of Ohio (IFO) members, their communication and information needs, and whether or not these needs were being satisfied by Extension. Seven research objectives were established: 1) To describe IFO farmers demographic characteristics; 2) To determine IFO farmers’ philosophical beliefs on land stewardship and environmental sustainability; 3) To determine their sustainable agriculture practices; 4) To describe the nature of communication among IFO farmers; 5) To determine their sources of information on environmentally sound agricultural practices; 6) To describe IFO farmers attitude toward Extension; and 7) To examine implications of this study for agricultural communication and other researchers.

A census was conducted using a survey mailed to IFO farmers in April and May, 1996. The 100% response rate perhaps indicates that respondents were interested in the study.

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Summary of Findings and Implications

The findings of this study were as follows:

Objective 1: IFO Demographic Description

Of the 70 IFO farmers, 82% were male and 17% were female. Average age was 47.5 years. Fifty percent had a college education, 13% of which had a Masters degree. One farmer had a doctoral degree. Nearly 70% were full-time farmers, that is, spending at least 40 hours a week on the farm. Forty percent had off-farm jobs; 35% own properties of 100 acres or less. The main products included: grain (70%), livestock (68%) and vegetables (46%). Seventy-six percent or more of family incomes of IFO members were from farming, and almost 39% respondents had at least one family member helping on the farm.

Objective 2: IFO Philosophical Beliefs

IFO farmers believed that: 1) Ecologically sound farming policies should be supported; 2) Sustainable agriculture should be promoted; 3) SA does not necessarily mean lowering profits; 4) Sustainability is more important than short-term maximum returns; and 5) SA places emphasis on biological systems, input efficiency and optimal yields. Other beliefs they hold include: 1) Promoting and sustaining healthy rural communities; 2) Fostering an ethical approach to land stewardship and the humane treatment of farm animals; 3) Educating the public on food safety; 4) Discovering alternatives approaches to expanding knowledge and access to information about SA; and 5) Expanding opportunities for farmers to make a transition to sustainable systems.
Objective 3: IFO Sustainable Agriculture Practices

IFO farmers mostly use sustainable agricultural practices including: 1) low chemical input, 2) cover crops, 3) conservation tillage and crop residue, 4) organic farming, and 5) farm enterprise diversification. Sixty-three percent of IFO farmers experienced some degree of soil erosion, for which they used control measures such as crop rotation, cover crops and grassed waterways.

Objective 4: Nature of Communication Among IFO Members

IFO farmers prefer communication methods that promote the sharing of ideas, such as farmers associations meetings, family and neighborhood gatherings. The perceived credibility of the change agent is an important factor on whether IFO farmers will accept this person or not. IFO farmers state their main reasons for association as follows: 1) Promote the cause of SA; 2) Learn about new practices; 3) Benefit from cooperative efforts; and 4) Increase profit margins. They are also eager to share information of their innovative practices with the stream farmers and general public, but find that there are few outlets for doing so. They find the local media institutions in Ohio not readily available.

Objective 5: IFO Farmers’ Sources of Information on Environmentally Sound Agricultural Practices

The preferred sources of information on SA innovative practices for IFO farmers include: 1) own experience, 2) OEFFA Newsletter, 3) IFO newsletter, 4) educational programs offered by non-profit organizations, and 5) educational programs offered by Extension.
Objective 6: IFO Farmers Attitude Toward Extension

IFO farmers believe that Extension could do more to help them. They are also concerned that Extension agents have a negative view of SA and hence they do not rely on information coming from OSU Extension to help them in their innovative agricultural practices. They also do not use on-farm visits by Extension agents or educational programs by Extension as a source of information on SA. However, they seem to agree that Extension agents' attitude is changing for the better. Although the USDA has ruled that Extension agents must promote SA (Agumba, 1995), IFO farmers do not feel supported.

Objective 7: Implications for Agricultural Communication and Other Researchers

The main findings of this study point to the need for an increased participation of agricultural communicators and other professionals and researchers in Extension activities. There are four main implications of this study: 1) for agricultural policy, 2) for curriculum development, 3) for agricultural communication, researchers and professionals, and 4) for other researchers.

1) For agricultural policy - as described by Rogers (1995) in his diffusion of innovations model, innovators such as IFO farmers, are effective only at influencing early adopters. The early adopters in turn, influence the early majority and late majority, thus promoting change in the whole population. It is the majority of people that can cause policy change in favor of Extension. Thus, by supporting innovation initiatives by IFO members, Extension can influence the adoption of SA practices by the majority of farmers.
2) For curriculum development - The need for training of Extension agents and workers, as well as farmers and general public, demands the development of a curriculum by the land-grant system universities. In-service training, graduate courses, seminars and workshops could be designed to address Extension agents and workers' needs for communication and needs assessment skills improvement. Courses and seminars could also be designed to address farmers' expressed training needs on SA issues, marketing of agricultural products, agricultural organization and management, and communication technologies. The agricultural industry and commercial sector need education and training on SA product use and marketing; and consumers need education on this new trend affecting their food consumption.

3) For agricultural communication researchers and professionals, there are two main implications of this study, one regarding the need for two-way communication improvement, and the other regarding the need for agricultural communication professionals to work with Extension. For the improvement of two-way communication in Extension, it would be necessary first to develop a curriculum for education and training of Extension workers and agents. Second, further research would be needed to address all the aspects and implications of this new communication approach in the agricultural setting. For agricultural communication professionals, the implications of this study regard their further participation on the following five areas: 1) communication between Extension and its clientele; 2) communication between innovative farmers; 3) communication between farmers and state experimental station researchers; 4) communication between farmers and the general public; and 5) communication between
Extension and the general public. The participation of agricultural communication professionals involves also the development of new media channels to diffuse SA and other innovative agricultural information.

4) For other researchers - the changing nature of the agricultural setting calls for the involvement of other science areas to further describe its implications. Rural sociology research, for example, is needed to address the rural-urban conflict that the close contact between farms and cities may bring. State experimental research stations such as OARDC need to investigate how they can best serve the needs of the new farmers. One way is for OARDC researchers to open their laboratories to the farmers for input and participation, or to develop collaborative research at the farmers’ own experimental field.

Summary of Implications

Extension agents need communication training to improve their perception of different groups of farmers, particularly SA farmers such as IFO. As it was demonstrated in this study, IFO farmers are willing to have Extension’s help with their SA cause. But they are also a unique group of well educated farmers who can also contribute with information and knowledge, rather than being taught. It appears that Extension agents could be better trained in the theory and practice of two-way communication. The agricultural communication professional can help facilitate it, as well as to elaborate in-service training and graduate studies curriculum for Extension agents education.

Extension needs to further understand the innovative communication processes among farmers who are practicing SA, particularly IFO farmers. The study of the communication patterns of those farmers, who fit Rogers (1995) innovators description,
can help to further understand changes and development in the agricultural setting. Furthermore, this study can identify areas in which Extension can participate as a supporter for those groups, and in so doing maintaining its traditional role as an agent of development. Based on the information IFO farmers provided in this study, there is a clear niche for Extension agents to be facilitators agent rather than change agents. Accordingly to Rogers (1995), “change agent is the individual who influences clients’ innovation-decisions in a direction deemed desirable by a change agency” (p. 335).

Facilitators, on the other hand, are those who provide alternative choices of information, so that the clients can make their own decision about the direction they want to take. The facilitator role requires open channels of communication, where the information flows freely, that is, two-way communication. Agricultural communication researchers are needed to study the impact of Extension agents different roles on the clientele, as well as to investigate the most effective ways to address such clientele needs.

IFO farmers are willing to share their knowledge/information with the general public, and are concerned with the lack of adequate media to diffuse this knowledge. IFO farmers have ideas they want to share with the general public but find that traditional commercial media do not serve as viable outlets for the dissemination of information. Agricultural media, especially Extension media, such as the OSU Extension Hot Line, the Journal of Extension and the Official Letter could help carry SA information. This suggests that agricultural communicators and Extension agents need to become more familiar with SA issues and concepts. This issue also addresses the growing need of consumers for environmentally concerned agricultural products. Agricultural
communication professionals are needed to work on the improvement and development of media dedicated to the SA cause to serve both farmers and consumers.

Other outcome of this study regards the implications for Extension's diversity approach. IFO is just one of the many groups that are surely part of Extension's clientele. To improve its ability to deal with all those different groups, Extension workers need training on needs assessment techniques, a process that aims at: 1) identifying the group characteristics; 2) determining relationship patterns; 3) determining the group's needs; 4) planning how to meet those needs. Needs assessment specialists are needed to improve this area in Extension.

This study also emphasizes the effect of farmers' organizations such as IFO in the agricultural policy, and how Extension can take advantage of this effect. As innovators, IFO farmers will influence early adopters, who will influence the early and the late majority (Rogers, 1995). Once the majority of farmers adopt an innovation such as SA, they will affect agricultural policy and Extension itself to change. By supporting a group of innovators such as IFO, the Extension system will be participating of the diffusion of innovation process, maintaining its role as a change agent in the agricultural setting.

Conclusion

There are two major conclusions of this study. First, IFO farmers do not perceive Extension as their primary source of information on SA. Second, Extension is not meeting the needs of a growing part of its clientele, represented by innovators such as IFO, who are concerned with the environment and using a sustainable set of farming practices.

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U. S. agriculture historically has gone from a sustainable approach, that is, environmentally conscious farming, to a full commercialization approach with its environmentally destructive implications. The IFO study seems to suggest that there has been a return to a more environmentally sound agriculture, which should be encouraged rather than dismissed as a radical approach.

IFO farmers have expressed a need for OSU Extension to be more helpful by understanding their needs as a first step to study them. OSU Extension seems to be coming to the aid of IFO farmers with the establishment of the Sustainable Agriculture Program in 1990. Perhaps administrators of this program could use the findings of this study to work more collaboratively with IFO farmers. The results of this study allowed the conclusion that overall IFO farmers believe there are eight major perceived weaknesses of Extension:

1) communication skills of Extension agents
2) opportunity for IFO farmers to give their input to the Extension system
3) farmers involvement in collaborative decision-making
4) taking into consideration IFO farmers' successful experiences
5) acceptance of SA as a valuable farming strategy
6) serving all the farmers in Ohio regardless their farm size and practices
7) providing useful information for SA farmers
8) being a source of agricultural innovations in Ohio.

IFO farmers need help from Extension and OARDC researchers but they want this learning experience to take place "on-farm" and with their active participation. They do
not like what they perceive to be a top-down communication method used by Extension. IFO farmers demonstrated their need for Extension agents to be facilitators for information exchange, rather than being the actual change agents. Results of this study showed that innovative farmers are change agents themselves, so they like to have the opportunity to access sources of information and make their own decisions. Thus, the role of Extension could be that of centralizing sources of information, facilitating the contact between farmers and such sources. As one of the farmers commented in the questionnaire (Appendix E), if Extension is to help IFO farmers, it has to put all the information at their fingertips, so that they “can look up research themselves or talk to the farmers involved to get the complete picture.”

Implications

IFO farmers are indeed innovators

The findings of this study confirm several points that Rogers (1995) makes in his classic book *Diffusion of Innovations* (fourth edition). In that book, Rogers describes how new ideas spread in a given social system. He noted that a new idea or practice is first accepted and adopted by only a small minority of the population (2.5% or less) then gradually it spreads to the rest of the population. The adoption of SA in Ohio fits Rogers diffusion model. SA, as an innovation, is adopted by a small minority, such as members of the IFO and the Ohio Ecological Food and Farm Association (OEFFA). The SA practice is still at the innovative stage and will undoubtedly spread as other farmers learn more about it and begin to see its economic, ecological, and social benefits. IFO farmers clearly fit the name “innovative”. Not only are they in the minority of farmers (.02% of
the population of 5,024,000 farmers in Ohio) but they also fit the description of
"innovators," according to Rogers (1995). He described innovators as highly educated,
with personal communication networks beyond their geographic boundaries and
venturesome, that is, willing to try new things. IFO farmers fit all three. More than 80% of
IFO farmers had attended college and 13% of them held a Masters degree; IFO farmers
not only belong to out-of-state organizations such as Acres U.S.A. (from Missouri),
Organic Crop Improvement Association (OCIA, from Wisconsin), Appropriate
Technology Transfer to Rural Areas (Attra, from Arkansas), but also to other national
farmers organization; and IFO farmers are willing to take risks that the newness of their
experience brings, such as the risk of lowering quality or quantity in production due to
lack of enough research to support agronomic decisions and of financial loss due to the
lack of research supported decisions.

IFO farmers have a strong philosophical view of SA

In Chapter II a definition of SA was provided covering issues such as land
stewardship, environmental concerns and promoting family farming. IFO farmers have
strong philosophical beliefs that support these areas. They believe that long-term
sustainability is more important than short-term maximum returns. Second, they believe
that the quality of rural life should not be sacrificed for increased agricultural
productivity. Third, they feel that SA practices should be promoted. Finally, they
believe that ecologically sound farming policies should be supported.
Advocacy for two-way communication

Rogers (1995) states that innovators have a need for more social participation than late adopters. IFO farmers exhibit this quality of social participation. They want to be involved in decision making, not wait for someone to make decisions for them. For example, they want to share their experiences with Extension, which may help in determining what needs IFO farmers have. Equally, they want researchers to make their findings more relevant by conducting on-farm experiments. IFO farmers clearly present new challenges to Extension agents and experimental stations researchers because they have needs which these professionals are not yet providing. At OARDC, for example, researchers need to listen to the clients, the farmers, to develop research that addresses actual problems of these farmers. IFO farmers have demonstrated that they want to participate in the studies developed at state experimental stations. They want to collaborate on providing inputs to the researchers and in carrying on actual experiments, thus making the research more relevant to them. Dillman (1985) states that if Extension is to survive as a necessary institution for the population, it has to meet the needs of its clientele, broadly defined. By ranking Extension in the fifth place as their source of information, IFO farmers confirm their need for Extension. Extension could be higher in their list of information sources if it tries to centralize more alternatives and opportunities to access valuable SA information.

Therefore, the implications of this study for agricultural communication and other researchers are clear:
1) Extension agents need more specific training in needs assessment to better know and understand their changing and diverse clientele;

2) There is a need for improving two-way communication between non-traditional farmers and Extension agents through problem-solving, team-work and participatory leadership development techniques;

3) There is a need for a curriculum that specifically addresses Extension agents’ and workers’ training needs, whether through in-service developmental programs or long term processes such as graduate courses;

4) There is a great potential for farmers such as IFO to be the Extension’s vector for disseminating agricultural innovations. Extension needs to support SA goals by targeting farmers’ needs in training and educational programs. Through participating in innovative movements such as IFO, Extension can maintain its role as a change facilitator in the U.S. agricultural setting;

5) There is a need for change among OARDC researchers in communicating directly with farmers as well as opening their facilities for farmers’ conducted research;

6) There is a need for improvement of Extension policies that specifically addresses its clientele growing diversity;

7) There is a need for understanding the effects of the rural/urban setting’s proximity both for agricultural activities and for consumers awareness.
Recommendations

There are six main recommendations based on this study:

1) Extension should continue to work at improving its effort at a participatory client-centered communication approach;

2) Extension should continue to work at improving its diversity skills by training agents in more accurate and participatory client needs assessment;

3) The land-grant system, with its components of education, research and Extension, should continue to work at developing a more adequate curriculum for Extension agents on communication, diversity and needs assessment;

4) The land-grant system should improve educational and research programs focusing on farmers’ declared training needs such as marketing techniques, organization and management, communication methods and new technologies;

5) The land-grant system should also address the general public’s needs, especially regarding agricultural industry awareness, commercial sector adaptation and consumer education;

6) The communication industry should work on the development of media channels to address SA issues. As demonstrated in the findings of this study, IFO farmers do not feel that they have enough media channels to spread innovative information on SA to the general public.

IFO farmers have a philosophy which reaches out to preserving the moral fabric of America, that is, faraing with the family in mind and all the ethical implications.

With the breakdown of the American family, a return to family values as pursued by IFO
farmers might be of interest to sociologists and should be studied. It could benefit the greater American community.

Another research might be needed in order to look at Rogers and Schoemaker’s 1971 model of adopter categories, for it appears that the IFO farmers represent a more sophisticated group of innovators than those studied by Rogers. For example, IFO farmers are interested in profits, but they also have philosophical beliefs globally in tune with world issues. Thus, they are committed to shaping the global environmental agenda through promoting SA practices.

Still another study could address the role of the communication revolution in changing the diffusion of innovation scenario in the agricultural setting. For example, the land-grant experimental stations are no longer the primary sources of innovative information for in-state farmers. These farmers are accessing information through the computer, specially the Internet system.

One of the clear findings of this study is the IFO farmers’ demand for more participatory methods of learning, or information sharing. This is in line with the most recent leadership concepts of teamwork or collaborative learning. What is also apparent from this study is the tendency of Extension agents to operate in a top-down, non-participatory fashion. Here is where initiatives such as by the OSUE Leadership Center could lead to the development of materials for Extension agents in client-centered, participatory leadership.

Two areas for improvement were recognized in this study: 1) it should have had a more extensive set of questions on Extension and 2) a larger group of SA farmers should
have been studied, such as OEFFA or Acres. A larger population would have provided
greater insight as to whether all SA farmers would have had the same view of Extension
as iFO farmers did. Such a measure would have shown how the views of iFO farmers
apply to a larger population, and would have enriched this study.

This study also acknowledges that further research is needed to address the
following topics: 1) how Extension can develop its participation as a facilitator in the
ever changing agricultural setting; and 2) how agricultural communication research and
professionals can help Extension to improve its service to SA and other emerging groups
of farmers.
LIST OF REFERENCES


89


Batte, M.T. (1992). Non published survey with farmers in Ohio on pest control measures. Columbus: The Ohio State University, Department of Agricultural Economics.


Bhola, H.S. (1965). The configurational theory of innovation diffusion. Columbus: The Ohio State University School of Education

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APPENDIX A

Permission letter to conduct study
Dear Farmer:

As a member of the Innovative Farmers of Ohio, I would like you to complete this survey on sustainable agricultural practices. Research on sustainable agriculture is very limited, therefore understanding the activities ofIFO farmers is one way for building the knowledge base in this new field.

This Master’s degree study is designed to obtain information from farmers like you on innovative farm practices as well as the philosophical views on sustainable agriculture. This study has the approval of Charles Eiselgroth, president of IFO, and his Board of Directors.

Please, take about 15 minutes to complete and return the questionnaire in the enclosed self addressed and stamped envelope by April 27. Please note that the information you provide will be treated confidentially. Also, findings of this study will be made available to the IFO members upon request. Your participation is highly appreciated.

Sincerely,

[Signature]
Prof. Robert Agonga
Principal Investigator

[Signature]
Ana Lucia Kazan
Research Associate
APPENDIX B
Sample of the Questionnaire
A Survey of the Information Needs and Agricultural Practices of Innovative Farmers in Ohio

by

Prof. Robert Agunga
and
Ana Lucia Katoan

Department of Agricultural Education
The Ohio State University
A. Land Stewardship

1. Indicate how you feel about each of the following philosophical statements, by circling a number from "1"(not subscribe) to "7" (strongly subscribe).

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not Subscribe</th>
<th>Strongly Subscribe</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Sustainable agricultural practices should be promoted.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>b. Ecologically sound farming policies should be supported.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>c. When it comes to the economics of farming, long term sustainability is more important than short term maximum returns.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>d. The quality of life should not be sacrificed for increased agricultural productivity.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>e. The primary goal of alternative agriculture is protecting the environment.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>f. Sustainable agriculture does not necessarily mean lower yields, with little or no use of chemicals.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>g. Increased use of chemicals is a necessary part of maintaining yields.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>h. Commercial agriculture, sustainable agriculture employs more science, new techniques and thorough understanding of methods.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>i. Sustainable agriculture places emphasis on biological systems, input efficiency, and optimal yields.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
2. How serious are the following issues to farming in your area? Please circle the appropriate number.

1 = Very Serious (VS)
2 = Serious (S)
3 = Somewhat Serious (SS)
4 = Not Serious (NS)
5 = Definitely Not Serious (DNS)

<table>
<thead>
<tr>
<th>Issue</th>
<th>VS</th>
<th>S</th>
<th>SS</th>
<th>NS</th>
<th>DNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Concentration of farmland in fewer hands</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>b. Urban encroachment on farmland</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>c. Increasing costs of entering farming</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>d. Decreasing numbers of family farms</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>e. Aging of the farm population</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>f. Too many government environmental regulations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>g. Contract farming</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3. Please indicate your level of agreement with the following statements by circling the appropriate number.

1 = Strongly Agree (SA)
2 = Agree (A)
3 = Disagree (D)
4 = Strongly Disagree (SD)

<table>
<thead>
<tr>
<th>Statement</th>
<th>SA</th>
<th>A</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. In general, sustainable farmers are satisfying with recommendations from state experimental research stations</td>
<td>1</td>
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<tr>
<td>b. Sustainable farmers have a wealth of information they can share with other farmers, researchers and extension workers.</td>
<td>1</td>
<td>2</td>
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<tr>
<td>c. Sustainable farmers have good ideas about economically sustainable agriculture, but there are few outlets for them to share these ideas with others.</td>
<td>1</td>
<td>2</td>
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<td>d. Sustainable farmers are willing to give interviews to reporters about their experiences.</td>
<td>1</td>
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<td>e. I would like to conduct my own on-farm research with the help of extension/research experts.</td>
<td>1</td>
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<td>f. I would like to hold on-farm tours to share knowledge from my own experiences.</td>
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<td>g. Other (Specify):</td>
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</table>
4. Please indicate your level of agreement with the following statements regarding the win of sustainable agriculture practices, by circling the appropriate number.

1 = Strongly Agree (SA)
2 = Agree (A)
3 = Disagree (D)
4 = Strongly Disagree (SD)

a. Promoting and sustaining healthy rural communities?
   1  2  3  4

b. Expanding opportunities for farmers to make a transition to sustainable systems?
   1  2  3  4

c. Educating the public to value safe and healthy food?
   1  2  3  4

d. Fostering an ethical approach to land stewardship and humane treatment of farm animals?
   1  2  3  4

e. Discovering innovative approaches to expanding knowledge and access to information about sustainable agriculture?
   1  2  3  4

f. Other (Specify) 

B. Sustainable Agricultural Practices

5. Which of the following innovative practices have you adopted or do you plan to adopt on your farm? (Please circle the number that best describes your opinion)

1 = Currently Uses (CU)
2 = Plan to Use (PU)
3 = No plan to Use (NU)
4 = Don’t Know (DK)

a. Low input use of chemicals
   1  2  3  4

b. Integrated pest management
   1  2  3  4

c. Use of cover crops
   1  2  3  4

d. Conservation tillage and crop residue management
   1  2  3  4

e. Intensive grazing systems
   1  2  3  4

f. No-till
   1  2  3  4

g. Farm enterprise diversification
   1  2  3  4

h. Interseeding
   1  2  3  4

i. Organic farming
   1  2  3  4

j. Other (Specify) 

a. Do you have soil erosion problems on your farm? (Circle the one that applies)

a. Not at all
b. A little
c. Some
d. A lot

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7. What method(s) did you use last growing season to control or prevent soil erosion? (Circle all that apply)

- a. No till
- b. Reduced tillage
- c. Conservation tillage
- d. Ridge tillage
- e. Contoured waterways
- f. Cover crops
- g. Forrager
- h. Crop rotation
- i. Biological weed control method (Specify)
- j. Other (Specify):

C. Farmers' Information Sources

8. On the left side, please indicate whether you are or aren't aware of the following sources of information on innovative agriculture practices. On the right side, please show how often you use them as sources of information. (Please circle the number that better indicates your position).

<table>
<thead>
<tr>
<th>Aware</th>
<th>Not Aware</th>
<th>Very Often</th>
<th>Often</th>
<th>Somewhat</th>
<th>Never</th>
<th>Very Never</th>
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</tbody>
</table>

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9. Please indicate your level of agreement with respect to coverage of sustainable agricultural issues by the popular media.

<table>
<thead>
<tr>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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</table>

a. Media coverage of sustainable agricultural practices is adequate.

b. The agricultural press is unduly influenced by the agribusiness industry.

c. The agricultural press gives little or no attention to alternative agriculture practices.

d. The popular media has a positive attitude toward alternative concepts.

e. The popular media has a positive image of agriculture.

f. There are few publications that carry information on sustainable farm practices.

g. Other (Specify): ____________________________

1 2 3 4

10. Please indicate how credible are the following sources of information for you.

<table>
<thead>
<tr>
<th>NC</th>
<th>SC</th>
<th>C</th>
<th>HC</th>
<th>VHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
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<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

a. Information from university experiment station test plots.

b. Information from OADC researchers.

c. Information from OSU Extension.

d. Information from The Rodale Research Center.

e. Information from neighboring farmers.

f. Information from the Ohio Ecological Food and Farmers Association.

g. Information from the Ohio Farm Bureau.

h. Information from the Ohio Department of Agriculture.

i. Information from the Ohio Farmers Union.

j. Information from members of Practical Farmers of Iowa.

k. Information from members of Innovative Farmers of Ohio.

l. Other (please specify): ____________________________

1 2 3 4 5

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D. Organizational Aspects

11. To which of the following organizations do you belong? Please circle all that apply.
   a. Ohio Ecological Food and Farmers Association (OEFFA)
   b. Corn Growers Association
   c. Soybean Association
   d. National Cattlemen
   e. Pork Producers
   f. Farms Bureau
   g. Farmers Union
   h. Innovative Farmers of Ohio (IFO)
   i. Farmers Cooperatives
   j. Civic (e.g. Rotary, Lions, Kiwanis)
   k. Other (specify): __________________________

12. Please indicate the level of importance of each of the following reasons for joining a farmers' organization, by circling the number that best represents your opinion.
   1= Not Important (NI)
   2= A Little Important (LI)
   3= Somewhat Important (SI)
   4= Very Important (VI)

<table>
<thead>
<tr>
<th>Reason</th>
<th>NI</th>
<th>LI</th>
<th>SI</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. For a sense of community</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>b. To increase my profit margin</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>c. To promote the cause of sustainable agriculture</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>d. To benefit from cooperative efforts</td>
<td>1</td>
<td>2</td>
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<td>4</td>
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<tr>
<td>e. For fun</td>
<td>1</td>
<td>2</td>
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<td>4</td>
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<tr>
<td>f. To learn about new practices</td>
<td>1</td>
<td>2</td>
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<td>4</td>
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<td>g. To enjoy political influence</td>
<td>1</td>
<td>2</td>
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<td>h. To gain access to insurance</td>
<td>1</td>
<td>2</td>
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<tr>
<td>i. To influence public policy</td>
<td>1</td>
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<tr>
<td>j. Other (specify): __________________________</td>
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</table>

E. Farmers' Training Needs

13. Please indicate your educational needs with respect to the following subject/topics by circling a number from “1” (not needed) to “7” (highly needed):

<table>
<thead>
<tr>
<th>Subject/Topic</th>
<th>Not Needed</th>
<th>Highly Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Soil conservation</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>b. Grazing (seasonal and rotational)</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>c. Holistic or integrated resource management</td>
<td>1 2 3 4 5</td>
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</tr>
<tr>
<td>d. Weed management in ecological agriculture</td>
<td>1 2 3 4 5</td>
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<tr>
<td>e. Pest control</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td>f. Marketing of agricultural products</td>
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<tr>
<td>g. Finance management</td>
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<tr>
<td>h. Research design</td>
<td>1 2 3 4 5</td>
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<tr>
<td>i. Soil fertility management</td>
<td>1 2 3 4 5</td>
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<tr>
<td>j. Role of organic matter in crop production</td>
<td>1 2 3 4 5</td>
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<tr>
<td>k. Tillage practices</td>
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<td>l. Other (specify): __________________________</td>
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</table>
F. Extension and Sustainable Agriculture

14. Please indicate your level of agreement with the following statements:

1 = Strongly Agree (SA)
2 = Agree (A)
3 = Disagree (D)
4 = Strongly Disagree (SD)

a. Until recently, many extension agents had a negative attitude toward sustainable agricultural practices.

b. Extension agents' attitudes are changing for the better in terms of their attitudes about sustainable agriculture.

c. Extension agents can do more to help farmers interested in alternative agriculture.

d. I believe that the Ohio Department of Agriculture is fully supportive of sustainable agricultural practices.

e. Government should strengthen regulations about the use of farm chemicals and pesticides on crops.

f. Government should strengthen regulations on the use of chemicals with farm animals.

H. Demographics

A few questions about yourself:

15. Gender (Please circle one):
   a. Male
   b. Female

16. In which of the following groups do you identify yourself? Circle the one that applies.
   a. Asian
   b. Black (African-American)
   c. Hispanic
   d. Native American
   e. White (Caucasian)
   f. Other (Specify):

17. Your age:

18. Highest level of education completed (Circle only one):
   a. Some high school
   b. Completed High School
   c. Some College
   d. Associate Degree
   e. Completed College
   f. Some Graduate Education
   g. Completed Master's Study
   h. Completed Doctoral Study

d. A lot
29. Please list 1 to 5 workshops, training seminars and/or continuing education courses in which you have participated that have been relevant as a way of learning about sustainable agricultural practices.
   a. 
   b. 
   c. 
   d. 
   e. 

30. Type(s) of farming activity(ies) in which you are engaged. Check all that apply.
    
    |   Yes   | No  |
    |---------|-----|
    a. Grain | 1   | 2   |
    b. Dairy  | 1   | 2   |
    c. Vegetables | 1   | 2   |
    d. Fruits | 1   | 2   |
    e. Livestock | ?   | ?   |

21. What is the size of your farm?
   a. 100 acres or less
   b. 100 - 250 acres
   c. 251 - 500 acres
   d. 701 - 750 acres
   e. 751 - 1,000 acres
   f. 1,001 acres or more

22. How long have you been in farming?
   a. 5 years or less
   b. 6 - 10 years
   c. 11 - 20 years
   d. 21 - 30 years
   e. 31 years or more

23. How long have you been using sustainable agriculture practices?
   _______ years.

24. Which crops do you plant?
   a. 
   b. 
   c. 
   d. 

25. What crop rotation system do you use?
   a. 
   b. 
   c. 
   d. 

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26. Where do you market your products?
   a. ___________________________   b. ___________________________   c. ___________________________

27. How much of your time is devoted to farming?
   a. Full-time (at least 40 hours a week)
   b. Part-time (at least 20 hours a week)

28. Do you have a non-farm job?
   a. Yes   b. No

29. What off-farm source(s) of income do you have?
   a. ___________________________
   b. ___________________________

30. Does your spouse have a non-farm job?
   a. Yes   b. No

31. How many members of your family do you have working on your farm?
   ___________________________

32. What percent of your total family income comes from farming?
   a. 10% or less   b. 11-25%   c. 26-50%   d. 51-75%   e. 76% +

33. Of the people in agriculture you talk to on a regular basis, what percentage is concerned with sustainable (or alternative) agricultural issues and practices?
   a. 10% or less   b. 11-25%   c. 26-50%   d. 51-75%   e. 76% +
Thank you very much for completing this questionnaire.

Please, return it in the self-addressed and stamped envelope by April 27 to:

Ana Lucia Kazan
203 Ag. Administration Bldg.
2120 Fyffe Rd.
Columbus, OH 43210
APPENDIX C
Sample of the First Reminder Card
Dear Farmer:

Approximately three weeks ago you received our Survey on the Information Needs and Agricultural Practices of Innovative Farmers of Ohio. If you haven't had time to answer it, please take a few minutes to complete it and return by May 25, 1996 to:

Ana Lucia Kazan
203 Ag. Administration Bldg.
2120 Fyffe Road
Columbus, OH 43210

Thank you very much for your cooperation.
(Please disregard this notice if you have already sent your survey)
APPENDIX D
Sample of the Second Reminder Card
Survivors of the Spring!

(It has been a rainy season, and everybody had a difficult time.)

But now that the weather is getting better, could you take a few minutes and answer our Survey of the Information Needs and Agricultural Practices of Innovative Farmers in Ohio? Please, let us know if you need another copy of the survey (Call (614) 292-4141, Ext. 4-1099). We've heard rumors that some surveys drowned. Those who have already sent it, please disregard this notice. Thanks to all of you for taking your time to help us out with this study, during one of the worst planting seasons on record. Your participation is highly appreciated. Sincerely,

Dr. Robert Agunga & Ana Lucia Kazan
203 Agricultural Administration Bldg.
2100 Fyffe Road,
Columbus, OH 43210
Phone: (614) 292-0202
APPENDIX E
Personal statements of IFO farmers found in the questionnaires
Personal statements of IFO farmers found in the questionnaires

1. Quality of life will be enhanced with long range maximum quality production.
2. The primary goal of alternative agriculture is produce quality products which automatically protects the eco-system.
3. Assuming science and technology knows better than the Creator.
4. Research is expensive. Why would I have to pay taxes to have our land grant university try to tell us we are all wet?
5. True research is observing nature and then working with.
6. Our biggest problem is negative input from agribusiness and land-grant colleges.
7. Healthy plants have low pest problems.
8. They have gone backwards.
9. Government always messes up. If we have biological healthy plants and animals, you don’t have to regulate poisons - they are not part of the equation.
10. Self-taught with equivalent of several Doctors degrees.
11. We are making a good living from 280 acres and 75 dairy cows for 3 families. Nobody works off farm to make money except some silo filling.
12. To promote soil life.
13. Lack of information from university/research stations on low input practices.
14. Agriculture is sustainable only if profitable.
15. Recommendations from state experimental stations do not exist.
16. The state does not support sustainable agriculture.
17. (About the use of on-farm visit by Extension agents and educational programs by Extension) Is this a joke?
18. (About belonging to the Farms Bureau) Only for insurance (under duress).
19. You are suggesting sustainable agriculture will not give best returns. Very questionable.
20. SA employs more knowledge, use of science, old technologies and alternate marketing techniques.
21. (About research conducted at state experimental stations) What research?
22. (About SA farmers spreading their ideas) The problem is that it is not acceptable to teaching staff because they say it is not scientifically gathered.
23. (About having help from Extension in IFO farmers conducted research) I have asked but have no response.
24. (About on-farm tours to share experiences) This is already going on but not attended by university personnel.
25. I am very pleased to fill this out. But I have a very big concern that your boss(es) and Gov. George have their noses drove up Polhman (the chickens mans ass so far
that the only thing that the big shots at OSU and the Ohio State Government is worried about is big chicken coops and big worthless hog operations that don’t do a damn thing for the down to earth family farm economy! I would like to hear from you on this matter. Thank you.

26. (About belonging to the Farms Bureau) Only for insurance: thinking about dropping it despite big discount.

27. If you want to help farmers put all the Extension/OSU information at their fingertips with indexes, etc. Free. Then we can look up research ourselves or talk to the farmers involved to get the complete picture. Every farm is different.

28. Extension agents still do (have a negative attitude toward SA practices).

29. Net profit is most sustainable farmers goals X yields.

30. Few publications carry accurate and in depth information on SA.

31. If Ohio State and Farm Bureau would get out of bed with agribusiness credibility could be regained.

32. I think they could monitor what we do and learn from it. Especially bio-dynamic agriculture.
APPENDIX F

“Other” statements by IFO farmers
Question A2 - Serious issues to farming.
1. Assuming science and technology know better than the Creator.
2. Call 513 484-4113
3. Lack of information from university/research stations on low input practices
4. 5 acre recreational farmers
5. Acid rain
6. Rising annual variable costs
7. Government programs favoring large producers
8. Risk to soil huge volume of H2O
9. Lack of local commodity processing facilities
10. Outdated zoning laws in our Twp. working against agriculture
11. Cost of help
12. Old aged landowners that only worry about money and to hell with young people willing to work their tail off to take care of the land
13. Exploitation of the soil and mining of it for short term profits
14. Too many government payments
15. Getting grain off farm on time, even with a contract to buy
16. No incentives or mechanisms to preserve farm land
17. Property rights movement
18. Creating wealthy rural community
19. People's health
20. Control of agriculture by the petro-chemical components

Question A3 - Level of agreement with SA farmers statements.
1. True research is observing nature and then working with!
2. TV's 20/20 to dismantle the A.M.A.
3. Sustainable agriculture don't know everything
4. More information be made available to vegetables & fruit growers
5. Not enough support at state and federal levels in SA concepts - O.D.A. and U.S.D.A. for example work force / dollars directed towards
6. More research on the populations and dynamics of life in the soil is needed
7. We do hold farm tours
8. Very broad questions
9. Networking with state: local agencies to promote results of farm research
10. Already had 7 field days and 7 winter seminars
11. More research needs to be done comparing organic products with commercial products.

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12. I find very little reports where this has been done.
13. They were for vegetables. Have received little for meat products.

**Question A4 - Level of agreement with SA practices statements.**
1. Our biggest problem is negative input from agribusiness and land grant college. Look at our whole system of 10 calories input versus 1 calorie production.
2. General health of ourselves and those we feed
3. I'm on line with Prodigy - so would be able to do e-mail and documents exchange on the computer at home
4. Supporting diversity of life in the soil
5. Put more farmers on the land
6. Expanding opportunities for new and more farmers
7. Communicate the direct relationship between sustainable farming and preventative health care of people, animals and farms.
8. Should work with natural cycles no upset any balances
9. Providing non toxic food with high nutrition

**Question B5 - Innovative practices adopted or planned to be adopted.**
1. Jubilee farming
2. Low input fertilizers like 9-18-9 to promote soil life
3. Interseeded forage, legumes & grasses into new crops
4. Using bio-solids on farm land via bio grow
5. Flame weeding
6. Ridge tillage system
7. Composting of manures
8. Recycle N (animal manure)
9. Value added processing
10. Certified organic growers
11. Holistic Resource Management
12. Bio Dynamic Farming
13. Sheet composting

**Question B6 - Methods to prevent soil erosion.**
1. No weed has become immune yet to the hoe - Summer fallow farming.
2. Use of cultivators on corn
3. Balance soils, paramagnetic elements
4. Installed drain tile to reduce surface water
5. Mulch - under sow vegetable crop with cover
6. (Specify) rotary hoe & row type cultivator
7. Left fence rows grow up to help break the wind and cause the snow to drift on my land
8. (Specify) delay planting, rotary hoe and cultivation planted wind break row
9. (Specify) Rotation hay crop

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10. Shallow chisel plow
11. (Specify) Proper residue management
12. (Specify) No chemicals all cultivation. No Fall plowing
13. Install drainage pipes to direct excess water
14. (Specify) Cover crops
15. Horse farming thus no soil compaction
16. (Specify) Soil mineral balancing
17. Improving humus level
18. 107.3 acres of own, 125 acres land is in CRP. Use bush hog to control obnoxious weeds.

Question C8A - Information sources awareness.
1. Successful biological consultants
2. Acres USA
3. Other farmers
4. Ridgetil Hotline
5. Points to view in travels around country
6. AM Small Farmer
7. New Farm
8. Harrow Smith
9. University of Minnesota Center for Alternative
10. Plants and Animal Products
11. Farm tours
12. Grassland Farmer Journal
13. New Farm Magazine, by Rodale
14. OAAO
15. Other sustainable farmers
16. Farm tours
17. Family experience
18. Other farmers experience
19. New England Farmers
20. Acres USA Publication
21. Henry Wallace Institute For Alternative Agriculture
22. Rodale Publications
23. Acres USA
24. Library
25. Neighbors experience
26. Biological consultants
27. OEFFA members.

Question C8B - How often do they use information sources.
1. Successful biological consultants
2. Acres USA
3. Other farmers
4. Ridgetil Hotline
5. Points to view in travels around country
6. AM Small Farm
7. New Farm
8. Harrow Smith
9. University of Minnesota Center for Alternative Plants and Animal Products
10. Farm tours
11. Grassland Farmer Journal
12. New Farm Magazine by Rodale
13. OAAD
14. Other sustainable farmers
15. Farm tours
16. Family experience
17. Other farmers experience
18. New England Farmers
19. Acres USA Publication
20. Henry Wallace Institute For Alternative Agriculture
21. Rodale Publications
22. Acres USA
23. Library
24. Neighbors experience
25. Biological consultants
26. OEFFA members

**Question C9 - Coverage of SA by popular media.**

1. The ruminant animal is a nature’s gift to Humanity to convert fiber to food.
2. Only when a negative occurrence happens do you see major TV or press pay attention
3. There is a vast unfilled market for better coverage of sustainable practices.
4. All main stream colleges & publications always put sustainable farming as can’t be for every one and leaves a cloud of doubt.
5. Positive documentation of successful alternative agricultural products has existed for many decades.

**Question C10 - Credibility of information sources.**

1. Successful biological farming consultants
2. Acres USA
3. University research is strongly influenced by the agribusiness industry in both directions and assumptions for interpretation (crops overvalued / costs under represented). Therefore university research is irrelevant (Although the science is generally credible) and often incorrect.
4. Attra
5. Your eyes
6. Dealers
7. Agri Energy Resources
8. University of California, Davis
10. Info from Acres USA

**Question D11 - Organizations to which they belong.**
1. Action in SWCD and farmland preservation
2. Church
3. None currently, only in the past
4. Chamber of Commerce
5. Ohio Jersey Ass.
6. American Farmland Trust
7. Organic Crop Improvement Association
8. Fellowship for Christian Farmers (just started local Chapter) (international)
9. OCIA
10. Science Teachers
11. Church
12. Volunteer Fire Dept.
13. Christian Church/ Power
14. Pasture Grazing Council - local
15. National Farmers Organization & OCIA
16. Rivers Unlimited, American Rivers, Greenpeace, National Wildlife Federation, SWCS
17. Organic Crop Improvement Association
18. P.F.I.
19. Demeter Association for BioDynamic Farming
20. Sierra Club
21. None but those serious about stewardship of land and animals
22. Ohio Cattlemen
23. American Chemical Society
24. Grange
25. Church
26. Herb guild of Warren Co./ Master Gardeners of Ohio/Kentucky

**Question D12 - Important reasons to join a farmers organization.**
1. Help the environment
2. Fellowship with farmers and witness for Jesus Christ
3. To learn about markets
4. Learn how to be a good steward
5. To help other small farmers stay in business and their future families
6. To reinforce knowledge of methods from past farming traditions

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7. To leave our land better than we found it

Question E13 - Educational/training needs
1. I am primarily self taught.
2. Marketing quality production crops
3. Composting large amounts of horse manure economically.
4. What is going on with genetics of our crops for pest/weed control and increase yields. Maybe continue wheat etc. could be put into practice.
5. Value added processing
6. Evaluation of equipment
7. The role of thermophilic and vermi-composting in large scale commercial organic farming
8. Holistic Veterinary Medicine
9. Spiritual scheme as it relates to cosmic rhythms and the Earth’s healing process.