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Sources of facts and advice for farmer decision-making concerning soil conservation practices in Grant County, Wisconsin

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**Sources of facts and advice for farmer decision-making concerning soil conservation
practices in Grant County, Wisconsin**

by

Tammy L. Enz

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

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ABSTRACT

This study uses diffusion theory and opinion leadership to investigate sources of facts and advice used in farmer decision-making concerning soil conservation practices. The importance of interpersonal interactions and the role of new communication technologies, including the Internet, email and the cellular telephone, as well as practical inquiry into which persons, organizations and/or media sources are important opinion leaders in the area of implementation of soil conservation were investigated. Information sources used in actual past behavior changes and information sources likely to be influential in a future hypothetical scenario were assessed.

Data for this study were gathered through a random sample mail survey of Grant County, Wisconsin rural landowners. A return rate of 48% yielded 268 usable surveys. Findings reveal that farmers use a number of sources for information concerning the adoption of soil conservation innovations, with ‘neighbors and other farmers,’ ‘government agency staff’ and ‘magazines and other publications’ being the most frequently used and the most important sources throughout the decision process. Perceived trustworthiness of a source was found to be a significant predictor of perceived source influence and although 40% of respondents reported that they are not Internet users, the Internet enjoys a relatively high-perceived trustworthiness among all respondents. Among Internet users, the Internet had a very high level of trust—ranking third behind ‘government agency staff’ and ‘neighbors and other farmers.’

CHAPTER 1: INTRODUCTION AND STATEMENT OF THE PROBLEM

My grandfather was a Wisconsin farmer for his entire life. Born in 1915, he would have been in his farming prime in the era when rural sociologists were first developing the premises for diffusion theory and identifying the role of opinion leaders in the diffusion of innovations.

My grandfather exhibited many of the attributes generalized about opinion leaders and was early to adopt such innovations as the threshing machine, indoor plumbing, and electricity. Neighboring farmers were often quick to follow my grandfather in adopting such innovations. My grandfather was both accessible and trusted by neighboring farmers and he served as a critical link between the information he obtained from media sources about farming innovations and the persuasion of his peers to adopt.

An opinion leader is an individual who leads in influencing others' opinions. The behavior of opinion leaders is important in determining the rate of adoption of an innovation in a system (Rogers, 2003). The opinion leader is also an important link in the "two-step-flow" theory of communication whereby mass media influence is postulated to travel through opinion leaders to peers who use this information in their decision-making processes.

The idea of near peers acting as opinion leaders in the changing of attitudes concerning adoption of innovations was first postulated in the middle of the twentieth century. Rogers writes, concerning the role of an opinion leader in the persuasion stage of the diffusion process:

"An individual usually wants to know the answer to the question 'What are the innovation's advantages and disadvantages in my situation?' This type of information, while often available from scientific evaluations of an innovation, is instead sought by most individuals from their near peers, whose subjective

opinions of the innovation (based on their personal experience with adoption of the new idea) are more accessible and convincing to them” (Rogers, 2003, p.175).

The relative influence of these peers over other information sources is worth examining in light of the technological and social changes in the rural landscape of America since the idea of opinion leadership was first proposed. Since the 1930s a series of events, including the great depression—an economic disaster for farmers—and the dustbowl, an equally devastating ecological disaster, have led a shift from rural farm life to urban centers. From a high of 8.8 million farms in 1935, the total number declined to slightly less than 2 million by 1999. The average farm size in 1935 was about 155 acres and by 1997 it was 471 acres (Boone, Meisenbach & Tucker, 2000).

The flight to urban centers throughout the decades has brought many changes to farm life. Among these are less diversity of crops and animals, an increased dependence on off-farm income for economic viability, and recently, a number of non-farming residents moving to the country. The small family farms which traditionally dotted the American landscape are quickly becoming a thing of the past.

The social landscape of America’s rural areas has changed as a result—gone are the days of church picnics, barn-raising, and square dances, and threshing parties which brought farmers in close regular contact with each other and their local communities and made interpersonal ties so important in diffusing agricultural technologies and making positive advancements in adjusting farmers’ attitudes regarding up-to-date farming practices. Studies now show that despite the increase in communication technologies and increased efficiencies of farming methods and improvements in transportation, the

rural farm community is becoming more fractured than ever. Smithers, Alun and Armstrong (2005) summarize the changes in the rural social structure:

“The histories of farming and rural communities have been closely intertwined, with farmers reliant traditionally on communities for material inputs and service provision and rural settlements oriented socially and economically toward agriculture. Thus, farm and community formed a cohesive functioning unit in which interests and aspirations were widely understood and largely shared. However recent decades have witnessed significant changes in the social and economic fabric of many rural areas” (Smithers et al., 2005, p.282).

Robert D. Putnam, in his 2000 book, *Bowling Alone*, examines the social changes in the American community:

“Evidence also suggests that across a very wide range of activities, the last several decades have witnessed a striking diminution of regular contacts with our friends and neighbors. We spend less time in conversation over meals, we exchange visits less often, we engage less often in leisure activities that encourage casual social interaction...We know our neighbors less well, and we see our old friends less often” (Putnam, 2000, p. 115).

Even as the social landscape of rural America is changing, new communication technologies are rapidly diffusing across the communities—computers, the Internet and

cellular telephones are changing the way people communicate and seek information. And in the midst of the vast changes in the physical and social landscapes of rural America, communities have come under increasing political and environmental pressures. The race for alternative energy sources means farmers will feel compelled to produce more row crops to meet increased ethanol production requirements. This intensive row cropping can have devastating consequences on soil, lakes, rivers, and groundwater. However there are several innovative farm conservation practices such as nutrient management programs, set-aside programs, no-till farming, contour stripping, stream-side buffer strips and others that can be successfully applied to farm fields to limit damage to soil and to surface and ground water quality in rural areas.

Soil erosion is a main conservation concern in almost every agricultural region in the United States. Soil erosion pollutes the environment and decreases the productivity of cropland. Many practices are effective in reducing soil erosion to acceptable levels; however U.S. government agencies have had only partial success in promoting their use in localities where conservation needs are greatest (Korsching & Hoban, 1990).

Korsching and Hoban (1990) suggests that the scientific area of inquiry known as the 'adoption and diffusion of innovations' can effectively assist in the implementation of soil conservation promotion programs.

It is a vital mission for those in the soil conservation/environmental field to get farmers to achieve a high level of adoption of these practices. The farming practices used by today's farmers will greatly impact the quality of the environment in the future. However, concern for environmental matters often proves to be a divisive factor among members of rural communities. Environmental regulations, public scrutiny and the

political influence of non-farm people in rural area has led to an increase in complaints and conflict (Smithers et al., 2005). It is with sensitivity to the delicate social structure of the farm community today that change agents must begin approaching the topic of enhancing environmental awareness.

Realizing the importance of opinion leaders and the messages they convey in the farm community can be of great value in this endeavor. But in light of the changing social nature and technological advancement of rural communities since the time the original concept was hypothesized, it is relevant to reexamine opinion leadership to find out if the premises first hypothesized in a relatively homogenous rural community still hold true in the fractured, highly mediated social landscape of the twenty first century. In addition it is worthwhile to examine the effect of new technologies—in particular those relating to the Internet— and their role in environmental information-seeking and influence. Understanding how opinion leadership functions in a contemporary rural community will be of great importance to change agents as they work toward widespread adoption of conservation practices in rural communities.

CHAPTER 2: LITERATURE REVIEW

Defining Opinion Leadership

There is no shortage of synonyms for opinion leaders. They appear in literature under a variety of names: trusted others, significant others, innovators, thought leaders, trendsetters, influentials, opinion givers, as well as opinion leaders. The term ‘opinion leader’ may imply qualities beyond simple informal advice-seeking from peers and may include a form of delegation of power or responsibility for decisions by the person asking advice, or intentional persuasion on the part of change agents, political activists, or would-be authority figures (Black, 1982). Katz and Lazarsfeld in *Personal Influence* (1955) describe the basic function of informal opinion leadership:

“What we shall call opinion leadership, if we may call it leadership at all, is leadership at its simplest: it is casually exercised, sometimes unwitting and unbeknown, within the smallest grouping of friends, family members, and neighbors...it is the almost invisible, certainly inconspicuous, form of leadership at the person-to-person level of ordinary, intimate, informal, everyday contact”
(Katz & Lazarsfeld, 1955, p.138).

Opinion leaders are responsible for bringing new ideas or innovations into a society and setting the stage for changing the norms within the society so that large scale adoption of the innovation can occur. This is based on the established proposition that

“when a number of persons are in interaction over an extended period of time, mutual expectations and norms develop for their behavior and their actions are dependent on these norms and expectations” (Marsh & Coleman, 1956, p. 588). Burt (1999) defines opinion leaders as “brokers between groups” (p.37). For decades, opinion leaders have held the attention of researchers who have sought to determine who these people are and the extent of their influence over others in their respective social systems.

Some of the applied contexts where opinion leadership has been studied include fashion (Baumgarten, 1975), healthcare decisions (Kravitz et al., 2003), the diffusion of prescribed drugs advice (Albertson, 2004), consumer products (Myers & Robertson, 1972; King & Summers, 1970; Chan & Misra, 1990), automobile purchase behavior (Richins & Root-Shaffer, 1988), cable television usage (Childers, 1986), political behavior (Schenk & Rossler, 1997), agricultural technologies (Marsh & Coleman, 1956; Rogers, 2003), forestry management (Haymond, 1988) and soil conservation (Korsching & Hoban, 1990). In general, these studies focused on identifying the characteristics of opinion leaders and finding positive correlations between social activity, knowledge about, and involvement with the innovation of interest and the likelihood of influencing others’ attitudes and/or behaviors concerning the innovation involved. The concept of opinion leadership has been examined in relation to several theoretical perspectives.

Opinion Leadership and Two-Step Flow

The idea of near peers wielding influence over others in their social system derives from the theory of the two-step flow of information. Two-step flow was first introduced by Lazarsfeld, Berelson and Gaudet in *The People's Choice* (1944), a study

that focused on the process of decision-making during a Presidential election campaign. This hypothesis asserts that information from the media moves in two distinct stages. First, individuals (opinion leaders) who pay close attention to the mass media and its messages receive the information. Opinion leaders pass on their own interpretations in addition to the actual media content. The term ‘personal influence’ was coined to refer to the process intervening between the media’s direct message and the audience’s ultimate reaction to that message. In this study, opinion leaders were found to be influential in getting people to change their attitudes and behaviors and are quite similar to those they influence.

Opinion Leadership and the Diffusion of Innovations

The idea of opinion leadership was integrated into the theory of the diffusion of innovations to describe the influence of interpersonal sources in personal decision-making in the diffusion of a technology throughout a community. The adoption and diffusion of innovations consists of two major processes: (1) the adoption process—a social psychological process in which an individual decides whether or not to use a new practice based on factors such as personal needs and resources, and support received through others such as friends, neighbors, or organizations and agencies, and (2) the diffusion process—the way in which a new practice is communicated throughout a community (Korsching & Hoban, 1990). This communication occurs via certain channels over time among members of a social system (Rogers, 2003).

An innovation in this context is defined as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 2003, p.12). Soil conservation measures are practices that can be considered as falling within this rubric. Their adoption within a social framework has been known to follow similar patterns as other innovations (Korsching & Hoban, 1990). However, it has been shown that farmers’ perceptions of soil conservation and other commercial innovations differ, and “previous applications of the innovation diffusion model to commercial innovations is a poor predictor of farmers’ soil conservation practice adoption” (Korsching & Hoban, 1990, p. 9).

In general, there are five stages through which the diffusion process has been found to progress (Rogers, 2003).

1. *Knowledge* occurs when an innovation is made known to an individual and the individual gains an understanding of how it functions.
2. *Persuasion* occurs when an individual forms an attitude, either favorable or unfavorable toward the innovation.
3. *Decision* takes place when an individual chooses whether to adopt or reject the innovation.
4. *Implementation* occurs when an individual begins to use the innovation.
5. *Confirmation* takes place when an individual seeks reinforcement for his/her previous adoption decision.

Traditionally, opinion leaders are believed to perform a vital role in the persuasion stage of the innovation process—the stage where attitudes are changed concerning an innovation. When people have already acquired information about an innovation (generally through mass media sources), it is postulated that they look to near peers who have had experience with the innovation to determine if such innovation will be advantageous or disadvantageous to them (Rogers, 2003).

In the diffusion process, opinion leaders act as role models within their communities, and their actions “can be important determinants of rapid and sustained behavior change” (Valente & Davis, 1999, p. 57). According to Sapp and Korsching (2004), this two-step process: information delivery, typically through mass media outlets, and social persuasion through endorsements of respected referent others can involve opinion leaders who are “either individuals or organizations located either locally or within a broader social collectivity” (p. 340). Historically, a most important idea promoted by proponents of the diffusion of innovations is the role of interpersonal communications in the diffusion process (Valente & Davis, 1999).

Opinion Leadership and the Repertoire Approach

Most past diffusion studies have focused on patterns of adoption, socio-economic characteristics and innovation specific factors instead of information seeking processes (Abbott & Yarbrough, 1999). Identifying characteristics such as educational level, age, socioeconomic status and media use, can be valuable to change agents in pinpointing whom to focus their efforts on to enhance the diffusion process; however, using this

strategy to identify who are the effective leaders in opinion change within a community operates under the assumption that an opinion leader is a single individual. This method of opinion leadership identification precludes the possibility of identifying an opinion leader as an organizational entity, or the possibility of more than one source of information contributing to attitude or behavior change.

Although traditionally persons seeking information have placed the greatest trust and reliance on personal primary sources with which they were personally acquainted and could interact on a face-to-face basis, researchers have debated the paradigm of the importance of interpersonal processes in influencing attitude change (Abbott & Yarbrough, 1999) and the use of a single influential source in attitude change (Abbott & Yarbrough, 1999; O'Keefe, Ward & Shepard, 2002). Some previous studies have indicated that a number of informational sources may be operating across the various stages of the diffusion of an innovation and that the same sources can be found as important sources of influence across the stages of the diffusion process (Abbott & Yarbrough, 1999). As far back as 1956, Marsh and Coleman were suggesting that the adoption of agricultural technologies was related to the norms operating in the neighborhood of study and suggested that the higher the adoption rate in a neighborhood, the greater the use of all sources of farming information and especially of such sources as agricultural agencies which are known to provide information about innovations (Marsh & Coleman, 1956). Likewise Narigon (1992) found that multiple sources of information were used by farmers, with those farmers possessing higher indicators of socioeconomic status using a greater number of sources for information than those with lower indicators.

O’Keefe, Ward, and Shepard (2002), suggest that farmers use a “combo” or repertoire of channels, with each playing a certain role for the individual. Some may be cheaper, some may have more credibility, and some may yield more information despite greater effort. Combinations of channels are used based on such attributes, not simply by sticking with the most credible or easiest to use (O’Keefe et al., 2002). In addition, O’Keefe et al. (2002) found that in regard to environmental issues, individuals are more apt to use groups of overlapping channels for information rather than relying primarily on a single channel as previous measures typically suggest. In general, the public uses communication channels, both mediated and interpersonal, as a function of their motivational need for particular information content, the availability of the channels, and their expectation of the usefulness of the channels, their comprehension of and attention to the channels, their cost, as well as their credibility (O’Keefe et al., 2002).

Empirical Studies

Korsching and Hoban (1990) completed a 1984 study of the diffusion of conservation information used by famers in southwestern Iowa. This study sought information about both the influencers of farmers’ conservation decisions as well as the perceived characteristics of these influential sources, such as trust, expertise, availability, convenience, timeliness and relevance. The study investigated the use of several different sources for conservation information under three broad categories: (1) US Department of Agriculture agencies (USDA), (2) local sources and (3) the mass media. The USDA agencies included several specific agencies working in the target area. Local

sources included farm businesses; bankers, loan officers, and farm managers; neighbors, friends, and other farmers; and local newspapers. Mass media sources included radio, television and farm magazines. Farmers were asked which of the previous sources of conservation information was the most trustworthy, the most knowledgeable, the most available or convenient, the most timely or up-to-date, and the most locally relevant (Korsching & Hoban, 1990). This study found that trust in a source related to farmers' perceptions and use of conservation practices.

The sources most frequently used for conservation information were farm magazines (86 percent), other farmers (82 percent) and the Soil Conservation Service (SCS) (77 percent). The SCS was named most frequently on each of the characteristics of being locally relevant (51 percent), most knowledgeable (50 percent), most timely (47 percent), trustworthy (44 percent) and available (42 percent). The ASCS (Agricultural Stabilization and Conservation Service) followed behind with most locally relevant (16 percent), most knowledgeable (17 percent), most timely (41 percent), trustworthy (18 percent) and available (51 percent). As a conservation information source, the use of farm magazines was shown to be most often related to awareness of erosion problems and the influence of the SCS was most often related to actual implementation of conservation practices. Korsching and Hoban (1990) attribute the importance of these sources to their relationship with perceptions of soil erosion problems and the use of conservation practices. Further, Korsching and Hoban (1990) put forth this argument to explain the importance of farm magazines on farmers' conservation attitudes and the notion that the interpersonal influential role of peer opinion leaders is being superseded by mass media sources:

“When the adoption and diffusion model was first developed and tested, several of the mass media channels were still in their developmental stages. As the mass media became more pervasive, their broadening roles have become more accepted. Farmers, along with other members of our society, have become accustomed to our mass information society. Although they may have always appreciated the available and timely aspects of a mass media channel such as a weekly journal, with the increasing sophistication of these publications, these characteristics of magazines seem to have superseded the trustworthy and knowledgeable characteristics” (Korsching & Hoban, 1990, p.8) of interpersonal sources.

Although Korsching and Hoban (1990) show that use of government agencies rates quite high in terms of behavior toward soil conservation practices, they do not distinguish among the channels used by such agencies (i.e. talking to a government agency staff person versus reading materials produced by the agency versus visiting a website). This could prove to be an important distinction in studies concerning the importance of the interpersonal interaction with an opinion leader and attitudinal change and could help in distinguishing the role which ‘new’ communication technologies such as the Internet may have in the process.

In a 1990s study of Wisconsin farmers and their use of conservation information, O’Keefe et al. (2002) established that individuals use repertoires or groups of overlapping information channels for various purposes. Factors such as demographics and socio-

cultural factors, and most importantly the perceived need for conservation information, predicted source use. The information sources included in the study were newspapers, local radio, local television, family and friends, magazines, talking with a commercial dealer, reading commercial dealer materials, talking with a county extension agent, reading county extension materials, talking with a county conservation agent, reading county conservation materials, talking with a Department of Natural Resources (DNR) agent, and reading DNR materials. Magazines, newspapers, and family and friends (in that order) were indicated as the most used channels by farmers in this study (O'Keefe et al., 2002). O'Keefe et al. (2002) also suggested that the environmental channels brought about by the Internet may have an effect of the future of farmers' information channel choices.

Research Questions

Through a review of the literature which examines the notion of opinion leadership, several important concepts emerge relating to the defining of opinion leadership. Among these notions are the ideas that mass media are important for dissemination of facts about an innovation and that interpersonal relationships with advisors influence the decision to adopt. Within this definition, several questions emerge: Who are the opinion leaders? Why do they lead? Is there more than one important advisor used for adoption decisions? Are different information sources used for finding facts and seeking advice? How important are interpersonal communications in adoption decisions? What role do new communication technologies such as the Internet

and the cellular telephone play? This study examines opinion leadership in a contemporary farm community by examining these basic premises resulting in theoretical implications and practical information for those working in the soil conservation/protection field.

Opinion leaders in attitude change

In seeking opinion leaders in the farm community as related to implementation of soil conservation practices, farmers' attitude toward such practices is the dependent variable of interest. The concept of attitude is expressed by "evaluative responses of some degree of favorability or unfavorability toward an attitude object" (Eagly & Chaiken, 1998, p. 269). An attitude object is anything that is discriminate or held in mind by the individual. Attitude objects can be abstract, concrete, individual or collective (Eagly & Chaiken, 1998). In this study the attitude object is the issue of implementation of soil conservation technologies. Attitude is made up of three components, affective, cognitive, and behavioral. The cognitive relates to thoughts, the affective to emotions and feelings, and the behavioral relating to actions or intentions to act. These thoughts, feelings, and behaviors are all directed toward the attitude object (Eagly & Chaiken, 1998). While attitudes can be expressed through thoughts, feelings, or behavioral responses, all three components need not be present (Eagly & Chaiken, 1998). Therefore, a change in attitude concerning the topic of soil conservation/protection will be associated with a change in how one feels, thinks, and/or behaves toward the object.

Source characteristics in predicting attitude change

Previous studies have contributed to knowledge about farmers' most used sources of information concerning environmental practices (O'Keefe et al., 2002; Korsching & Hoban, 1990) and about farmers' perceptions of information sources' levels of trustworthiness, knowledge, availability, timeliness, and locally relevance (Korsching & Hoban, 1990).

Korsching and Hoban (1999) hypothesized that when making decisions on conservation practices, farmers, like others deciding on the use of new technologies, are shifting to sources of information that are available and timely as well as trustworthy and knowledgeable.

Accessibility

Researchers stress the importance of individual access to information sources when studying information source use because both the amount of information available about an innovation and the mix of sources carrying that information change over time (Abbott & Yarbrough, 1999). The idea that the everyday accessibility of information sources is a predictor of their role in influencing citizens' opinions has been discussed with reference to politics. Liu (2007) makes this statement concerning opinion leaders in the political process:

“Citizens are subject to the influences of information sources other than opinion leaders. Even when citizens like to discuss politics with political experts, they do not talk to opinion leaders all the time everyday. As a result, it is very likely that

social networks and the news media take over the role of opinion leaders” (p. 247).

In this case, accessibility is a key factor in attitude change. Likewise, in the farming community, accessibility and contact on a regular basis with information sources may affect the extent to which these sources are influential in changing farmers’ attitudes toward conservation practices. Recent studies have shown that accessibility and speed factors seem to exert greater influence on an individual’s choice rather than the amount and quality of information available (Korsching & Hoban, 1990). Indeed, in a study of organization environments, Christensen and Bailey (1997) found that perceived source accessibility did have a clear effect on source selection. Also, several studies have investigated the relationship between perceived source accessibility and source selection and use, finding that perceived source accessibility rather than expected quality of information determined source selection and use (Culnan, 1983). People’s access to relevant sources of information changes over time and region (Abbott & Yarbrough, 1999) making it important to establish which information sources are accessible to the study population. While general media sources are nearly universally accessible to Midwest farmers, some specialized publications and paid consultants are available only to larger farmers or farmers raising certain crops (Abbott & Yarbrough, 1999). The perceived accessibility of an information source can be measured by its availability to the user and by the ease of using the source or restrictions to its use (Christensen & Bailey, 1997).

Credibility

Another source characteristic which has been an important component of influence on attitude is credibility. The degree of influence wielded by an opinion leader is predicated in part on the potential adopter's assessment of his or her credibility and trustworthiness (Valente & Davis, 1999). The credibility of an information source has been shown to be a key element especially in attitude change (Cozma, 2006). Concerning farmers and the diffusion of environmental practices, credibility has been explicated to have two dimensions. The first dimension is expertise, or the degree to which the source has the knowledge to provide the needed information. The second dimension of credibility includes trust (Korsching & Hoban, 1990) This dimension of credibility can also be defined by the *character* or goodness and trustworthiness of a person, and *caring*, the extent to which one believes the other cares about his/her welfare (Chory, 2007). "A source that has the farmers' interest at heart may be considered more trustworthy than a source motivated by self-interest" (Korsching & Hoban, 1990, p. 3).

Research Question 1: a) Who is filling the opinion leadership role in farmers' decisions regarding soil conservation/protection? b) What source characteristics are important in predicting attitude change?

Discrete functions of information sources

A key concept in traditional research on the two-step flow of information focuses on the discrete functions of various information channels in influencing human behavior (Abbott & Yarbrough, 1999), as in mass media functioning in the awareness stage and

interpersonal interactions functioning in the decision phase of the diffusion process. The pervasiveness, accessibility and perception of credibility associated with mass media as indicated by Korsching and Hoban (1990) may blur this traditional distinction. A number of sources may be operating across the innovation stages (Abbott & Yarbrough, 1999). In the questioning of landowners' information seeking behavior, awareness of issues was related to use of sources for fact-seeking while advice-seeking is associated with adoption decisions/attitudes change.

Research Question 2: Are different information sources important at the fact-seeking stage versus the advice-seeking stage in the adoption of soil conservation/protection technologies?

Interpersonal versus impersonal influence

Forms of communication are typically differentiated between mass and interpersonal sources whereby mass is defined as publically transmitted impermanent messages directed to larger, heterogeneous, anonymous audiences. Interpersonal communications have been understood to involve face-to-face transfer of information allowing the uses of all senses for sending and responding (Walter, 1981). The differentiation between interpersonal communication (either face-to-face or mediated by some device such as a telephone or computer) differs from impersonal (mass) communication in its capacity for feedback (Walter, 1981). This feedback (two-way) communication method has been deemed more successful in getting the public involved in environmental issues than other communication forms (Duram & Brown, 1999). The

Internet blurs this distinction in the sense that its message capacity can be mass, yet the faculty for individualized messages and two-way feedback allows for interpersonal interaction which O’Keefe et al. (2002) call ‘electronically personal’. The differentiating between impersonal and interpersonal information sources is important to this study as is understanding if any distinction exists in farmers’ preferences to interact interpersonally via face-to-face or through a mediating communication device (telephone or computer).

Information sources and channels are conceptually distinct. An information source is defined as a medium in which knowledge/ information is stored and a channel is defined by the means used to move information from one point to another (Nilakanta & Scamell, 1990). In reality many media, including the Internet, function as information channels in moving information from sources such a people or organizations from one point to another. However, following the methodology of O’Keefe et al.(2002), the term *sources* was used in the survey questions, since previous experience indicates that *channels* causes confusion for some respondents and, while conceptually distinct, the terms *sources* and *channels* appear to mean the same thing for the majority of respondents (O’Keefe et al., 2002).

Sources include media such as books, periodicals, people, and electronic sources (Nilakanta & Scamell, 1990; Christensen & Bailey, 1997). In studies of sources used by farmers in conservation decisions, information sources have included: newspapers, local radio, local television, family and friends, magazines, talking with a commercial dealer, reading commercial dealer materials, talking with a county extension agent, reading county extension materials, talking with a county conservation agent, reading county conservation materials, talking with a Department of Natural Resources (DNR) agent,

and reading DNR materials (O'Keefe et al., 2002) as well as USDA agencies, farm businesses, bankers, loan officers and farm managers (Korsching & Hoban, 1990). In addition to 'sources' used in previous studies, this study also includes the Internet and paid consultants.

Research Question 3: a) What is the importance of interpersonal interaction versus impersonal intersection with information sources at the various decision stages in soil conservation/protection decisions? b) Among interpersonal communications, can the telephone or other communication devices (such as email) replace the value of face-to-face interaction in making decisions about soil conservation/protection practices?

This thesis examines farmers' use of information sources relating to attitude change in the implementation of soil conservation/protection practices. It also examines the importance of interpersonal interactions in the process. In addition, this study will be helpful in gaining insight into the use of new technologies that have not been included in past studies (i.e. the Internet; and the telephone/cellular telephone and email as extensions of interpersonal communications with near peers).

CHAPTER 3: METHODOLOGY

Method of Data Gathering

Data for this study were gathered through a self-administered mail survey sent out in two waves during the month of June 2009. As a pretest, the questionnaire was administered to a five rural landowners from the Platte River watershed in Grant County, Wisconsin. After revising the questionnaire based on the responses from this test group, the survey was then submitted to and approved by the Institutional Review Board at Iowa State University prior to mailing.

Population and Sampling

Rural landowners in the Platte River watershed were chosen as the population for this study because rural inhabitants make up over 40% of the population in the Platte River watershed; most of these rural residents are also farmers (USDA, 2002). The watershed is located in a region recently targeted by several federal, state, and local initiatives to improve water quality through land conservation efforts. The Platte River watershed, in the corner of southwest Wisconsin, covers over 350 square miles. The watershed is encompassed roughly within the rural townships of Paris, Smelser, Harrison, Platteville, Ellenboro, Lima, Liberty, and Clifton. Property tax records supplied by the county tax office and township plat maps were cross referenced to identify all rural landowners in the eight townships owning more than 25 acres. Targeting landowners with more than 25 acres produced a population that includes landowners who either farm

the land they own, rent it out for agricultural use, or make other land use decisions, such as enrolling in set-aside programs which could have significant environmental impacts in the watershed. Six hundred and three landowners matched the criteria for the study and the entire population received the mail survey. An incentive was issued along with the mail survey to increase the likelihood of a higher response rate following the recommendation of Wimmer and Dominick (2006). The incentive in this case was a chance to be included in a drawing to receive \$50. Discounting mail surveys which were returned as undeliverable yielded a response rate of 48 percent.

Survey Instrument

The questionnaire was printed on green paper with the title, “Grant County Landowner Opinion Survey” to help describe the purpose of the study. A cover letter explained that the purpose of the questionnaire was to understand how rural landowners use information sources to gain knowledge about farming and conservation practices. The cover letter also stated that the questionnaire was intended to be filled out by a person who is responsible for making land-use decisions and should be passed to the appropriate person or returned unanswered if the addressee did not fit that description. A postage-paid Iowa State University return envelope completed the packet which was sent out in an official university envelope with metered postage. The survey and cover letters are included in the appendix.

The questionnaire was seven pages in length and consisted of 18 questions. The first two questions established that the person completing the questionnaire actually owns

land in the target area. The initial open-ended question asks how long this land has been owned by the respondent. A second question is used as a screening question to make sure the person filling out the questionnaire is in fact the person responsible for making decisions on how their land is farmed. For this question the respondent is asked to identify how the majority of the land he/she owns in Grant County is used. Respondents were given the choices (1) I actively farm the land; (2) I rent the land to someone else to farm AND I am involved in decisions on how the land is farmed; (3) I rent the land to someone else to farm AND I am NOT involved in decisions on how the land is farmed; or (4) Other (specify). Respondents who marked (3) were asked to STOP filling out the survey and to either send it back or pass it on to the person who does make the decisions. A third question asks the respondent to indicate how many acres of land he or she plans to farm in 2009. The response was to include both land owned and rented by the respondent.

Source characteristics

Four questions ask respondents about their perceptions of characteristics of nine information sources: neighbors and other farmers (face-to-face, by telephone, or by email); salesmen or product representatives; government agency staff (such as FSA or County Land Conservation Office, UW-Extension); paid consultants; radio; television; newspapers; magazines and other publications and Internet sources. A space was also provided for respondents to list another source not on the list.

Accessibility

The first two questions in this set establish the general accessibility of the sources. Availability and ease of use are measures of source accessibility (Christensen & Bailey, 1997). However the term ‘availability’ proved to be confusing to respondents in the pilot survey resulting in the rewording of the survey question to ask about actual past use of the sources in order to establish availability.

1. Frequency of interaction

The first question asks “How often in the past 12 months have you used or interacted with the following information sources?” A five point scale was used for this question ranging from (1) Never to (5) Very often. Additionally, “Doesn’t apply” was offered as a selection by each source in each question.

2. Ease of Use

The second question asked about each source was, “How easy to use do you believe the following information sources are for you?” A five point scale was used for this question to measure from (1) Not easy at all to (5) Very easy. Additionally, “Doesn’t apply” was offered as a selection.

Credibility

A third and fourth question were asked to determine the perceived credibility of each of the nine information sources specific to the issue of gaining information about techniques in soil conservation/protection.

1. Trustworthiness

The first of these asked, “Please indicate the extent to which you find each of these sources trustworthy in terms of giving about techniques in soil

conservation/protection?” A five point scale was used for this question to measure from (1) Not at all Trustworthy to (5) Very Trustworthy. Additionally, “Doesn’t apply” was offered as a selection.

2. *Expertise*

Perceived expertise of each of the information sources was determined by asking the question, “How knowledgeable do you find each of these sources in terms of their ability to give you information about techniques in soil conservation/protection?” A five point scale was used for this question to measure from (1) Not at all Knowledgeable to (5) Very Knowledgeable. Additionally, “Doesn’t apply” was offered as a selection.

Attitude change

Hypothetical Attitude Change

A hypothetical attitude change question presented a scenario asking the respondent to imagine that a new technique in soil conservation/protection is being introduced to the community. It asks “if the cost of this new technique was not an issue, how likely is it that you would change the way you feel about using the new technique based on the recommendations of the following information sources?” The same nine information sources and an area to specify an “other” source are included. Respondents are given a five point scale for answering this question with (1) Very Unlikely to (5) Very Likely with a space for “Doesn’t apply.”

Actual Behavioral Change

The questionnaire section dealing with actual behavioral change began with a screening question to determine past behaviors with respect to soil conservation or other

environmental practices: “In the past five (5) years have you implemented any new technique or changes in soil conservation/protection in your farming or on your land?”

“Yes” answers were offered three additional questions; the first is an open-ended question: “If yes, what was the practice you used?”

1. *Fact-seeking*

The second question asked, “Indicate which sources you used to find out facts about the new technique. Check all sources that you used to find out facts.” The same nine information sources are listed with two columns: (1) “I used for facts (mark all that apply)” and (2) “Most important sources(s) of facts (mark top three).”

2. *Advice-seeking*

A similar question was used for advice-seeking behavior: “Indicate which sources you used to get advice about a new technique. Check all sources you used for advice. Then check the sources that you felt gave the best advice. Again two columns are offered: (1) “I used for advice (mark all that apply)” and (2) “Gave the best advice (mark top 3).”

Interpersonal versus impersonal influence

Two questions were presented to explicitly understand respondents’ preferences for either interpersonal or impersonal interactions in regard to techniques in soil conservation/protection. (The terminology ‘interpersonal’ proved to be confusing to respondents in the pilot testing; therefore the term ‘personal’ was used in the final survey questionnaire as it appeared to be conceptually synonymous with ‘interpersonal’ and easier to understand for respondents.) The first question asks, “When looking for FACTS

about a new technique in soil conservation/protection, do you PREFER to interact with information sources: (1) On a PERSONAL level (in person, by phone, meetings, farms demonstrations, etc.), (2) On an IMPERSONAL level (listening to the radio, reading newspapers, magazines, or websites, etc.), or (3) It doesn't matter. The second question in this section was identical except it replaced the word FACTS with ADVICE and repeated the response choices.

Face-to-face versus communication devices

The following question was used to determine if the nature of the interpersonal communication is important (i.e. face-to-face versus mediated through communications devices). This question asks "Indicate how much you agree with the following statement: The telephone and other communication devices (such as email) are just as good as talking face-to-face with another person when I am looking for advice about new techniques in soil conservation/protection." A five point scale ranging from (1) Strongly Disagree to (3) Neither Agree nor Disagree to (5) Strongly Agree was provided.

Demographics

The final section of the questionnaire was used to collect demographic information including age, gender, highest formal educational level achieved and gross household income. The questions to elicit age and gender questions are open ended. The educational level question supplies six categories: (1) Some High school, (2) High School Diploma, (3) Some College or Vocational Training, (4) College Degree, (5) Some post-

college schooling, and (6) Post-college Degree. Gross total household income in 2008 is broken into six interval categories, ranging from less than \$5,000 to over \$100,000.

Method of Data Analysis

Regression analysis and calculations of frequencies were used to answer the research questions.

CHAPTER 4: RESULTS

Characteristics of Respondents

The study received 268 usable surveys. Landowner respondents were categorized according to how they reported using the majority of the land they own in Grant County. Forty-nine percent of the respondents (132 respondents) reported actively farming their land; 20% (54 respondents) reported renting their land to someone else while being involved in making land use decisions; 8% (20 respondents) reported they currently have the land enrolled in a cropland reserve program (CRP) or use the land for pasture; 4% of respondents (11 respondents) reported they are involved in forestry or prairie restoration projects on a majority of their land; 3% of respondents (7 respondents) reported using the majority of their land for hunting and/or recreation; and 16% of respondents (44 respondents) reported they rent the majority of the land they own in Grant County to someone else and are not involved in decisions on how the land is farmed. Figure 1 shows the distribution of land use. Landowners in the last category were asked to stop filling out the survey after indicating they did not take part in making land use decisions and these respondents are not included in any further analysis. This procedure ensured that the survey responses captured the opinions of landowners who are involved in decision-making involving land use.

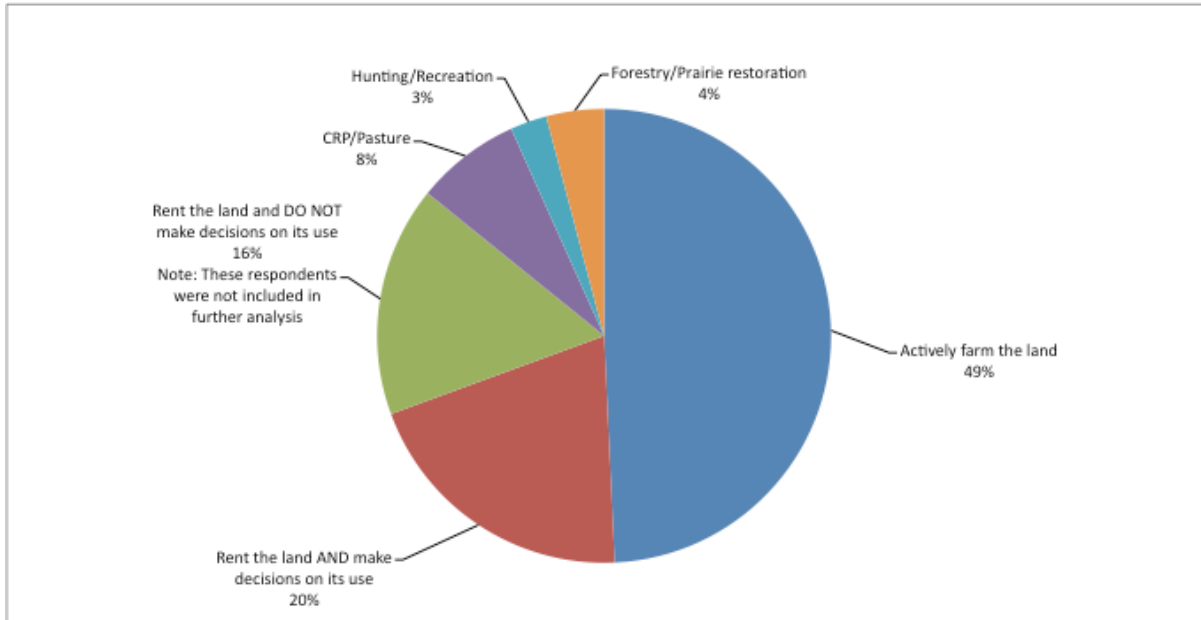


Figure 1. Land use as indicated by percentage of respondents

For those respondents who were categorized other than “not involved in decisions on how land is farmed,” the total acreage which the respondent intended to farm and/or manage in the year 2009 was asked. For this question, landowners were asked to include not only land which they own, but also land which they rent from others for the purpose of farming. The average acreage which was indicated as farmed and/or managed in 2009 was 310 acres. Acreages ranged from 25 acres (the minimum acreage allowed to be included in the study) to 1600 acres. A distribution of the acreages (see Figure 2) indicates that the majority of acreages fall below the mean acreage size, with two-thirds (66.7%) of respondents indicating plans to farm or manage acreages of 300 acres or less.

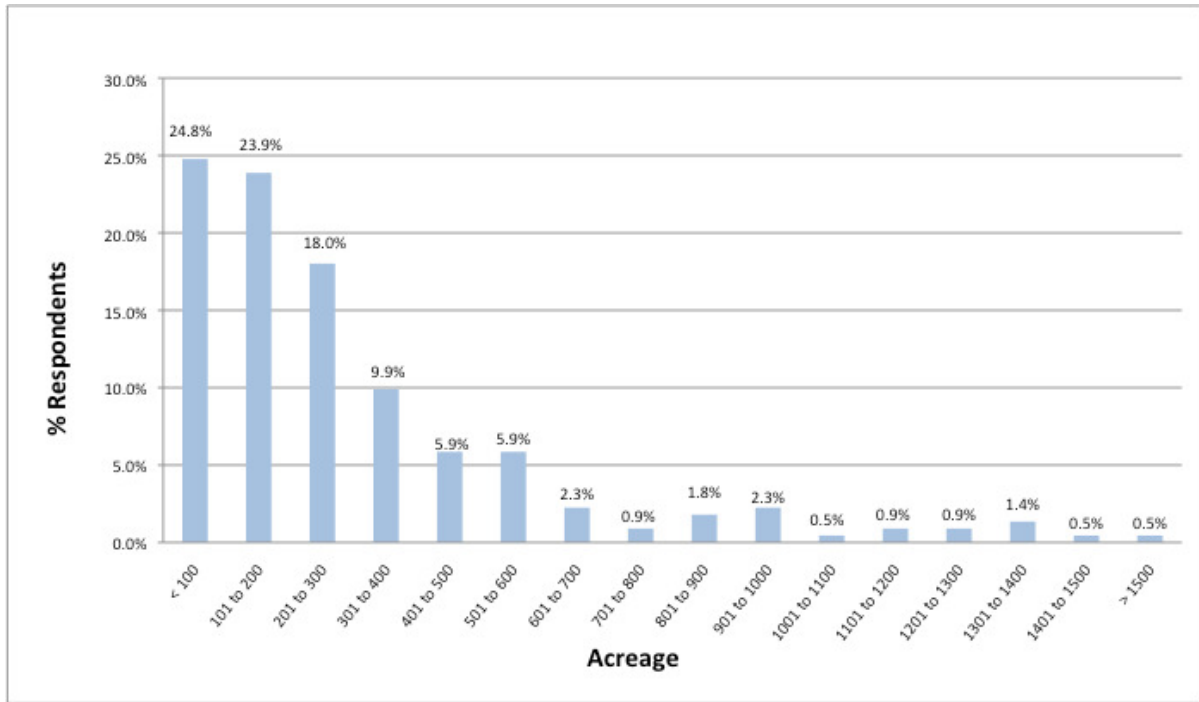


Figure 2. Acres farmed/managed in 2009 by percent of respondents

Respondents were asked to indicate how many years they had owned land in Grant County. Years of land ownership ranged from two years to 100 years, with an average ownership time of 27 years. This question may have been interpreted differently by various respondents, with some indicating the number of years they have personally owned the land, and others indicating the number of years which the land has “been in the family” as indicated by notes in the margins of some of the returned surveys.

The majority of respondents—84% (184 respondents) — indicated “male” for gender. Sixteen percent (35 respondents) indicated “female” for gender.

Of the 217 survey respondents who reported their age, the average age was 58 years of age, with respondents ranging in age from 33 to 88. Bracketing of the respondents revealed that 6% of respondents were ages 31-40; 19% of respondents were ages 41-50; 33%

of respondents were ages 51-60; 27% were ages 61-70; 12% were ages 71-80; and 3% reported themselves as being aged 81-90 years. Figure 3 graphically displays the age groupings.

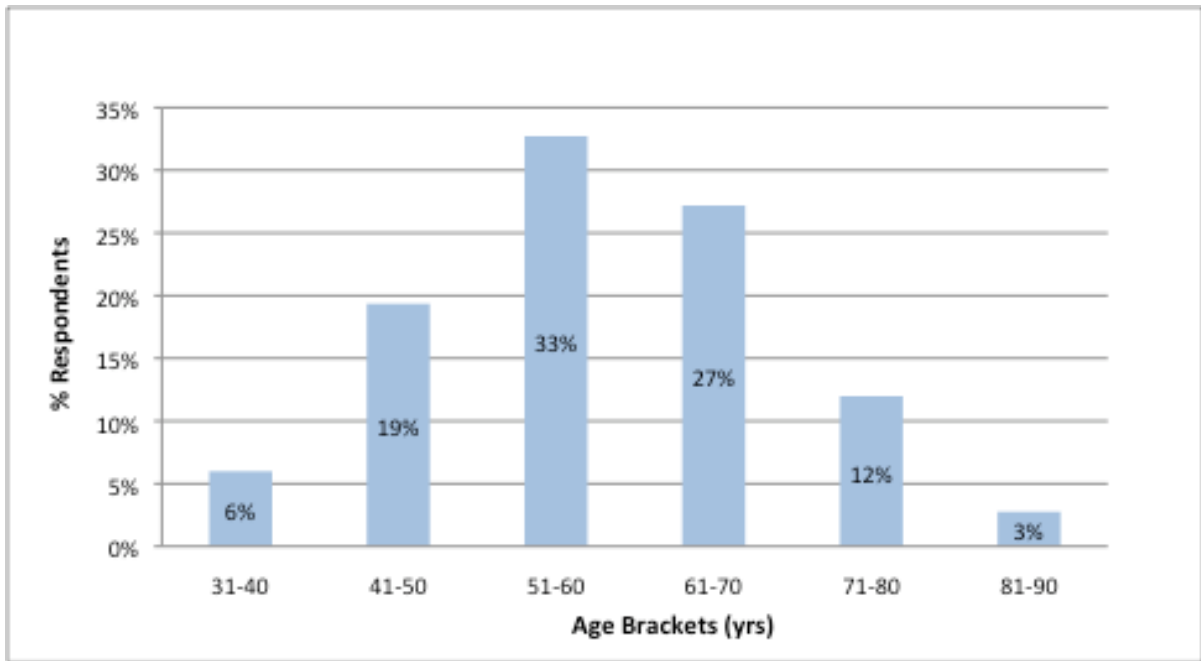


Figure 3. Age groupings of survey respondents by percentage

Two hundred and twenty respondents answered the question concerning the highest formal level of education achieved. Of the respondents, 91% indicated that they had achieved at least a high school diploma. Over a third of the respondents (34%) indicated the completion of a college degree.

Nine percent (19 respondents) indicated that they had not achieved a high school diploma; 26% of respondents (57 respondents) indicated a high school diploma as the highest level of formal education achieved. Thirty-two percent (70 respondents) reported some college or vocational training; 17% (38 respondents) indicated their highest level of

education as being a college degree; while 5% (10 respondents) and 12% (26 respondents) reported some post-college schooling and a post-college degree as their highest level of formal education achieved, respectively. Figure 4 displays the highest formal level of education achieved by percentage of respondents.

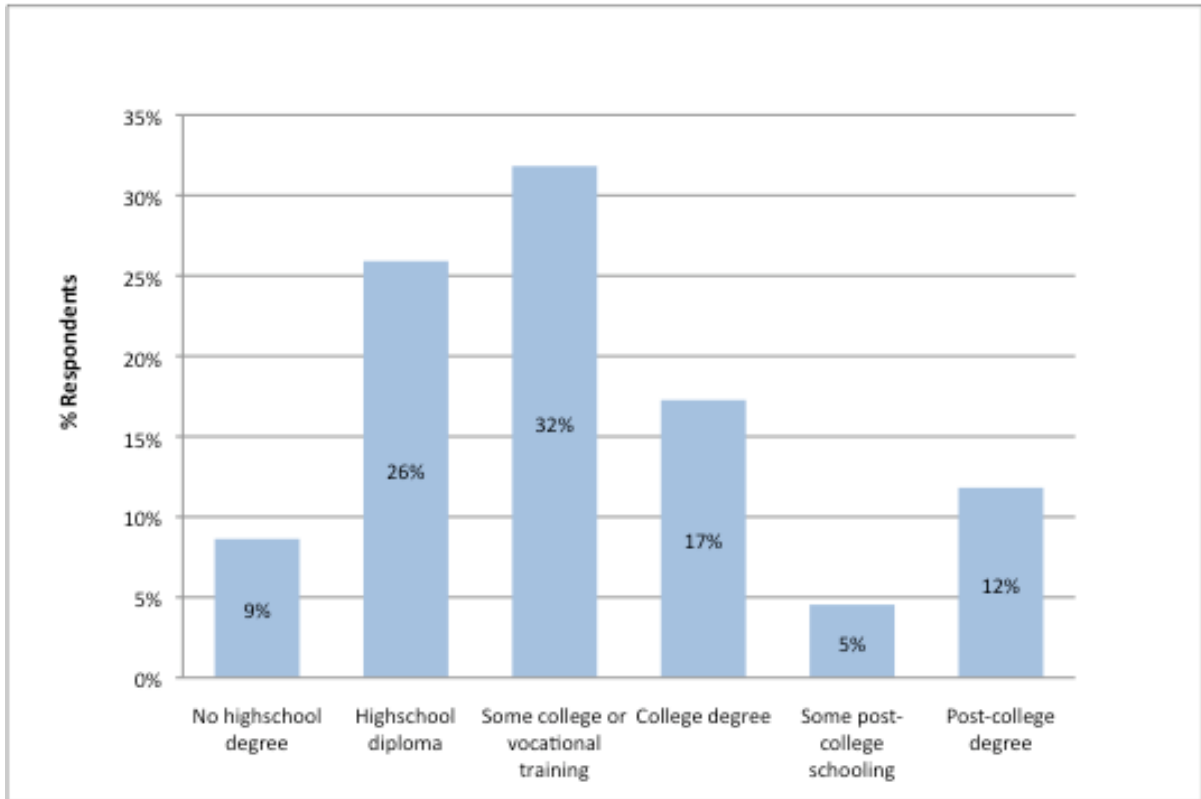


Figure 4. Highest level of formal education achieved

Of the 185 respondents who answered the question concerning their gross (before taxes) household income in 2008, 30% (55 respondents) indicated a gross household income exceeding \$100,000; 20% (37 respondents) reported an income ranging from \$75,001-\$100,000; 23% (43 respondents) reported gross household income in the \$50,001-\$75,000 bracket; while 21% (39 respondents) reported income in the \$25,001-\$50,000 bracket; the

remaining 1% reported an income of \$5000 or less. Figure 5 displays the gross income ranges.

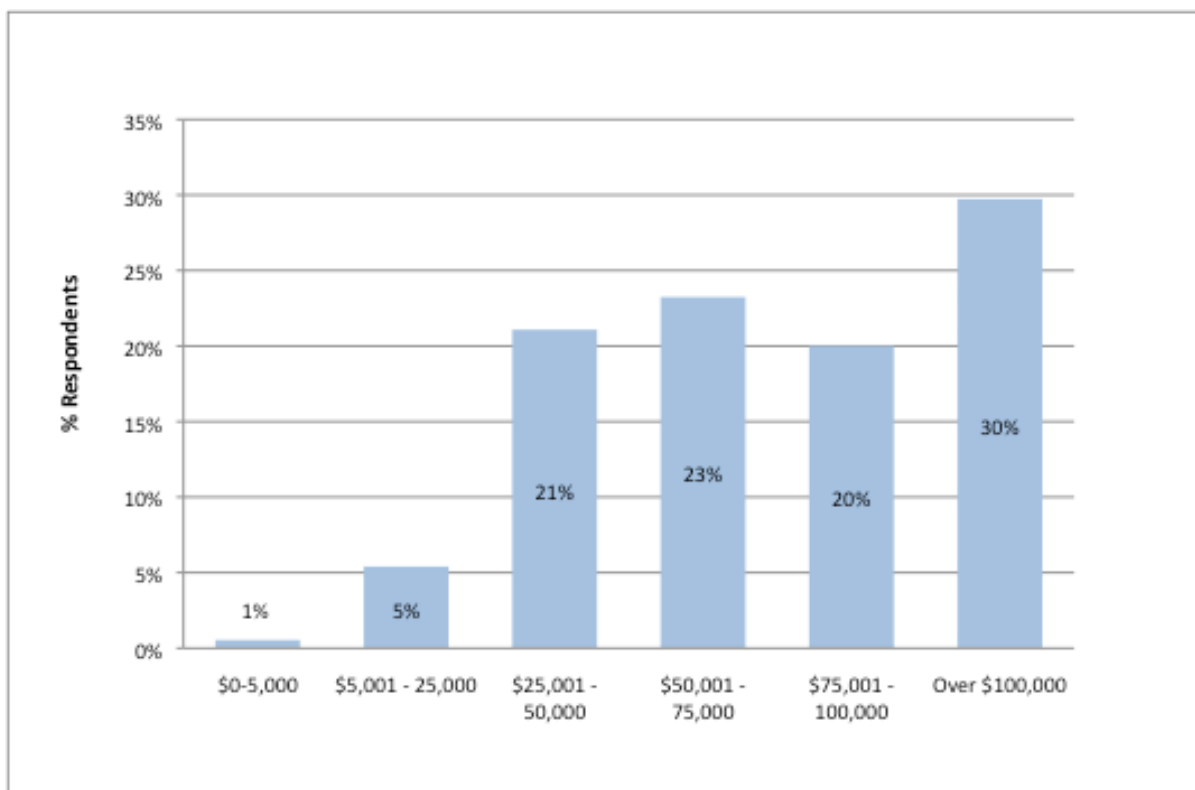


Figure 5. Gross household income 2008

Opinion Leaders in Attitude Change

Research Question 1a): Who is filling the opinion leadership role in farmers' decisions regarding soil conservation/protection?

Two separate lines of questioning were used to determine the relationship between various information sources and landowners' changes in attitudes concerning techniques in soil conservation/protection. The first line of questioning supplied a hypothetical "what if" scenario and the second line of questioning inquired about information sources used for

advice in relation to actual past behavior concerning the implementation of soil conservation/protection practices. For the scenario-based line of questioning, landowners were asked, “How likely is it that you would change the way you feel about using the new technique based on the recommendations of the following information sources?” Nine information sources were listed: neighbors and other farmers (face-to-face, by telephone, or by email); salesmen or product representatives; government agency staff (such as FSA, County Land Conservation Office or UW-Extension); paid consultants; radio; television; newspapers; magazines and other publications; and Internet sources. A space was also provided for respondents to list an additional source. Respondents rated each source on a five-point scale from ‘very unlikely’ to ‘very likely.’ In addition to the nine listed sources, one respondent wrote in “studies/trials” as a source likely to influence his/her attitude on a new technique in conservation/protection.

The ranking of mean scores for likelihood of an attitude change by landowners presented with a hypothetical scenario concerning a new technique in soil conservation/protection being introduced to the community followed this order:

1. Neighbors and other farmers ($M=3.68$, $SD=1.12$)
2. Government agency staff ($M=3.45$, $SD =1.21$)
3. Magazines and other publications ($M=3.08$, $SD =1.10$)
4. Newspapers ($M=2.97$, $SD =1.15$)
5. Radio ($M=2.85$, $SD =1.10$)
6. Salesmen and product representatives ($M=2.80$, $SD =1.14$)
7. Internet ($M=2.72$, $SD =1.25$)

8. Television ($M=2.71$, $SD =1.15$)

9. Paid Consultants ($M=2.33$, $SD =1.35$)

In a second line of questioning, respondents were asked which of the same nine information sources provided the best advice in instances when they had actually implemented a new technique in soil conservation/protection. Ninety six survey respondents indicated that they had actually implemented a new conservation technique within the past five years. A different question was used in this case. Here landowners were asked, “Who gave you the best advice?” For this question respondents were asked to pick their top three choices and no rating per source was provided. Results in the second case are based upon frequency of mention per information source, while those in the hypothetical case are actual mean score rankings. However, despite the different methods of assessment, the top three information sources are consistent across the lines of questioning. For each case—actual past behavioral change and hypothetical future attitude change—‘farmers or other neighbors’ were reported as most likely to influence attitude and were listed most frequently in giving the best advice concerning the new technique, followed by ‘government agency staff’ and ‘magazines and other publications.’ Table 1 presents ranked sources based on hypothetical questioning and frequencies of indication as a top three source of best advice for actual behavior change.

Table 1. Evaluation of influential sources in hypothetical attitude change and actual behavior change

Hypothetical Attitude Change*	Actual Behavioral Change**
1. Neighbors and other Farmers	1. Neighbors and other farmers
2. Government Agency Staff	2. Government Agency Staff
3. Magazines and Publications	3. Magazines and Publications
4. Newspapers	4. Salesmen and product Reps.
5. Radio	5. Internet
6. Salesmen and Product Reps.	6. Radio
7. Internet	7. Newspapers
8. Television	8. Paid Consultants
9. Paid Consultants	9. Television

*Ranking was determined by comparing means of likelihood to follow recommendations from each source.

**Ranking was determined by frequencies of indication as a top three source for giving best advice.

Source Characteristics in Predicting Attitude Change

Research Question 1b): What source characteristics are important in predicting attitude change?

Landowners' perceptions of four characteristics—frequency of interaction, ease of use, expertise, and trustworthiness—of nine different information sources (neighbors or other farmers; salesmen or product representatives; government agency staff; paid consultants; radio; television; newspapers; magazines and other publications; and the Internet) were

determined by using a five point scale. Table 2 compiles the means and standard deviations for these characteristics by information source.

Table 2. Source characteristics—accessibility and credibility

Sources	Accessibility (general use—no special topic)		Credibility (specifically about soil conservation)	
	Frequency of Interaction ¹ (Q4)	Ease of Use ² (Q5)	Expertise ³ (Q13)	Trust – worthiness ⁴ (Q14)
	Mean Std. Dev. N	Mean Std. Dev. N	Mean Std. Dev. N	Mean Std. Dev. N
Neighbors or other farmers	3.83 (1.18) 194	4.30 (0.98) 198	3.79 (1.01) 205	4.02 (0.96) 203
Salesmen or product reps.	2.93 (1.27) 182	3.52 (1.26) 173	3.32 (1.10) 184	2.99 (1.14) 189
Government Agency Staff	3.01 (1.19) 198	3.66 (1.24) 193	4.04 (1.15) 198	4.08 (1.10) 200
Paid Consultants	1.30 (0.71) 168	2.35 (1.38) 110	2.98 (1.43) 104	2.85 (1.38) 100
Radio	3.17 (1.46) 183	3.65 (1.29) 179	2.94 (1.10) 176	3.02 (1.01) 182
Television	2.92 (1.41) 181	3.30 (1.37) 175	2.75 (1.13) 174	2.88 (1.07) 182
Newspapers	3.24 (1.25) 180	3.68 (1.24) 181	3.14 (1.10) 183	3.13 (1.11) 187
Magazines & Publications	3.32 (1.20) 191	3.71 (1.15) 186	3.52 (1.02) 187	3.37 (1.07) 194
Internet	2.56 (1.44) 167	3.19 (1.65) 155	3.21 (1.32) 147	3.05 (1.16) 147
Others	4.20 (0.84) 5	4.33 (1.15) 3	—	—

N=224

¹ 1=never to 5=very often

² 1=not easy at all to 5=very easy

³ 1=not at all knowledgeable to 5=very knowledgeable

⁴ 1=not at all trustworthy to 5=very trustworthy

As indicated in Table 2, frequency of interaction and ease of use were applied to questions about the general accessibility of the nine information sources, while expertise and trustworthiness characteristics were in relation to the credibility of the nine information sources on the specific topic of soil conservation/protection practices. (A space marked “other” was given for respondents to indicate additional sources with these characteristics). Four respondents wrote in other sources of information which they interacted with frequently and which they found easy to use. These additional sources were ‘unpaid consultants,’ ‘seminars,’ “my renter” and “the company I work for.” No additional sources were written in for the credibility measures.

Accessibility

Accessibility was measured by the frequency of interaction with the source and by the perceived ease of use of the source.

Frequency of interaction

Frequency of interaction scores were based on a five-point scale ranging from 1=Never to 5=Very Often (see Table 2). Sources were ranked by their mean frequency of interaction scores resulting in a list of sources by frequency of interaction:

1. Neighbors and other farmers (M=3.83, SD =1.18)
2. Magazines and other publications (M=3.32, SD =1.20)
3. Newspapers (M=3.24, SD =1.25)
4. Radio (M=3.17, SD =1.46)
5. Government agency staff (M=3.01, SD =1.19)

6. Salesmen and product representatives (M=2.93, SD =1.27)
7. Television (M=2.92, SD =1.41)
8. Internet (M=2.56, SD =1.44)
9. Paid consultants (M=1.30, SD =0.71)

An additional area of interest concerning the frequency of use for each of the information sources concerns the indications of which sources were indicated as 'never' used in the past 12 months or sources which were marked with 'doesn't apply.' Table 3 shows the number and corresponding percentages of respondents who indicated that they had never used the respective sources in the past 12 months or that use of that source did not apply to them.

Table 3. Sources not used in the past 12 months (general use)

Sources	Never	Doesn't Apply	N	Percent of Respondents saying "never" or "doesn't apply"
Neighbors or other farmers	7	4	198	6%
Salesmen or product reps.	30	12	194	22%
Government Agency Staff	19	4	202	11%
Paid Consultants	137	23	191	84%
Radio	31	11	194	22%
Television	36	13	194	25%
Newspapers	15	6	186	11%
Magazines & Publications	14	5	196	10%
Internet	56	18	185	40%

These responses indicate for this study population a majority of respondents (84%) were not using paid consultants and a large percentage (40%) were not using the Internet. Other sources were used more frequently than paid consultants and the Internet as shown by the lower percentages in Table 3. The following sources showed the lowest indications of non use: (1) neighbors and other farmers (6%); (2) government agency staff (11%); (3) magazines and other publications (10%); and (4) newspapers (11%). Three sources were identified in the next non-use category, around 20% non use: (1) salesmen and product representatives (22%); (2) radio (22%) and (3) television (25%).

Ease of use

The ease of use for each source was measured by using a five-point scale with 1=not easy at all to 5=very easy (see Table 2). A list was compiled ranking the sources according to their perceived ease of use:

1. Neighbors and other farmers (M=4.30, SD =0.98)
2. Magazines and other publications (M=3.71, SD =1.15)
3. Newspapers (M=3.68, SD =1.24)
4. Government agency staff (M=3.66, SD =1.24)
5. Radio (M=3.65, SD =1.29)
6. Salesmen and product representatives (M=3.52, SD =1.26)
7. Television (M=3.30, SD =1.37)
8. Internet (M=3.19, SD =1.65)
9. Paid consultants (M=2.35, SD =1.38)

Table 4 provides a comparison of the rankings of the sources in the accessibility measures including frequency of use and ease of use. The most accessible information sources according to the measures of frequency of interaction and ease of use were ‘neighbors and other farmers’; ‘magazines and other publications’; and ‘newspapers’. The least accessible sources were ‘television, ‘the Internet’ and ‘paid consultants’. ‘Radio,’ ‘Government agency staff,’ and ‘salesmen and product representatives’ ranked in the middle in accessibility measures. Frequency of interaction and ease of use rankings were quite similar as shown in Table 4.

Table 4. Source rankings based on general accessibility measures

Frequency of Interaction (mean score)	Ease of Use (mean score)
1. Neighbors and other Farmers (M=3.83)	1. Neighbors and other Farmers (M=4.30)
2. Magazines and Publications (M=3.32)	2. Magazines and Publications (M=3.71)
3. Newspapers (M=3.24)	3. Newspapers (M=3.68)
4. Radio (M=3.17)	4. Government Agency Staff (M=3.66)
5. Government Agency Staff (M=3.01)	5. Radio (M=3.65)
6. Salesmen and Product Reps. (M=2.93)	6. Salesmen and product Reps. (M=3.52)
7. Television (M=2.92)	7. Television (M=3.30)
8. Internet (M=2.56)	8. Internet (M=3.19)
9. Paid Consultants (M=1.30)	10. Paid Consultants (M=2.35)

Credibility

For measures of credibility, sources were ranked according to their perceived levels of expertise and trustworthiness as related to techniques in soil conservation/protection.

Expertise

Mean scores for the perceived expertise of the sources were based on a five-point scale where 1=not at all knowledgeable to 5=very knowledgeable (see Table 2). The sources were ranked according to their mean scores of perceived expertise on the subject of implementation of soil conservation/protection measures:

1. Government agency staff (M=4.04, SD =1.15)
2. Neighbors and other farmers (M=3.79, SD =1.01)
3. Magazines and other publications (M=3.52, SD =1.02)
4. Salesmen and product representatives (M=3.32, SD =1.10)
5. Internet (M=3.21, SD =1.32)
6. Newspapers (M=3.14, SD =1.10)
7. Paid consultants (M=2.98, SD =1.43)
8. Radio (M=2.94, SD =1.10)
9. Television (M=2.75, SD =1.13)

Trustworthiness

Source trustworthiness was measured on a five-point scale with 1=not at all trustworthy to 5=very trustworthy (see Table 2). Sources were ranked accordingly based on their perceived level of trustworthiness related to the subject of soil conservation/protection:

1. Government agency staff (M=4.08, SD =1.10)

2. Neighbors and other farmers (M=4.02, SD =0.96)
3. Magazines and other publications (M=3.37, SD =1.07)
4. Newspapers (M=3.13, SD =1.11)
5. Internet (M=3.05, SD =1.16)
6. Radio (M=3.02, SD =1.01)
7. Salesmen and product representatives (M=2.99, SD =1.14)
8. Television (M=2.88, SD =1.07)
9. Paid consultants (M=2.85, SD =1.38)

Table 5 shows a comparison of the ranking of the sources according to the credibility measures. In credibility measures 'government agency staff'; 'neighbors and other farmers'; and 'magazines and other publications' ranked the highest. 'Salesmen and product representatives' ranked quite high (fourth highest) in expertise, but lower (seventh of nine) in trustworthiness. The Internet ranked fifth in both of the credibility measures. 'Paid consultants' also enjoyed a higher credibility ranking than a trustworthiness ranking. 'Radio,' 'Television,' and 'newspapers' all ranked higher in trustworthiness measures than they did in expertise ranking.

Table 5. Source rankings based on credibility measures specific to soil conservation/protection issues

Expertise (mean score)	Trustworthiness (mean score)
1. Government Agency Staff (M=4.04)	1. Government Agency Staff (M=4.08)
2. Neighbors and other Farmers (M=3.79)	2. Neighbors and other Farmers (M=4.02)
3. Magazines and Publications (M=3.52)	3. Magazines and Publications (M=3.37)
4. Salesmen and Product Reps. (M=3.32)	4. Newspapers (M=3.13)
5. Internet (M=3.21)	5. Internet (M=3.05)
6. Newspapers (M=3.14)	6. Radio (M=3.02)
7. Paid Consultants (M=2.98)	7. Salesmen and product Reps. (M=2.99)
8. Radio (M=2.94)	8. Television (M=2.88)
9. Television (2.75)	10. Paid Consultants (M=2.85)

To determine how the four characteristics (frequency of interaction, ease of use, expertise, and trustworthiness) of the nine information sources influence attitude change, multiple regression analysis was performed for each information source. Each information source was treated as a separate case in which attitude change in a hypothetical scenario was treated as the dependent variable and the four characteristics—frequency of use, ease of use, expertise and trustworthiness—were the independent variables. The results of the regression analysis are displayed on Table 6. For all information sources (with the exception of ‘paid consultants’), perceived trustworthiness was a significant predictor of attitude change in a hypothetical scenario. The perceived expertise of a source was only a significant predictor

for 'radio,' 'television,' and 'the Internet,' while ease of use was a significant predictor of attitude change for 'neighbors and other farmers,' 'salesmen and product representatives,' and 'radio.' Frequency of interaction was a predictor of attitude change only for 'paid consultants' and 'radio.'

These findings suggest that trust in an information source is the greatest predictor of attitude change. Indeed, the top three trustworthy sources of information—'government agency staff,' 'neighbors and other farmers,' and 'magazines and other publications'—were also the same three sources which were indicated most frequently as giving the best advice in the case of actual behavioral change. Perceived trustworthiness was not found to be a significant predictor of attitude change for paid consultants. This is likely explained by the low incidence of use of paid consultants among the study population.

Further investigation was made into the three most influential information sources—'neighbors and other farmers,' 'government agency staff,' and 'magazines and other publications'—to see if any of the demographic variables—size of acreage farmed, income level, educational level, age, land use—had a significant impact on any of the source characteristics in predicting attitude change. Analysis was performed by treating each characteristic—frequency of use, ease of use, expertise, trustworthiness—for each of the information sources as a separate dependent variable and analyzing the effect of each of the demographic variables on that specific characteristic of that source. Only educational level was a significant predictor of trust in 'magazines and other publications' ($p < .05$).

Table 6. Multiple regressions test of perceived source characteristics on hypothetical attitude change by information source

		Dependent variable: Hypothetical attitude change								
Independent Variables		Neighbors or farmers	Salesmen or product reps.	Government Agency Staff	Paid Consultants	Radio	TV	Newspapers	Magazines & Publications	Internet
Accessibility	Frequency of Interaction	.077	.064	.012	.323*	.251*	.009	.168	.124	-.002
	Ease of use	.180*	.291*	.062	.114	-.205*	-.018	-.089	.069	.063
Credibility	Expertise	.029	-.045	.133	.257	.218*	.331*	.102	-.028	.231*
	Trustworthiness	.202*	.387*	.394*	.010	.326*	.277*	.435*	.422*	.423*
	R ²	.118	.333	.289	.268	.302	.283	.289	.214	.395
	N	177	145	165	60	136	130	139	151	112

* $p < .05$

Note. Coefficients are standardized betas.

In addition, further analysis into demographic variables' effect on the Internet as a source revealed that none of the demographic variables—size of acreage farmed, income level, educational level, age, land use—was a significant predictor of the level of perceived expertise or trustworthiness of the Internet. However, age and education level were found to be significant predictors of the frequency of use of the Internet. Age, educational level, as well as land use and income were all found to be significant predictors of the perceived ease of use for the Internet. Since a relatively large percentage (40%) of the respondents indicated that they were not using the Internet (see Table 3), and since perceived source trustworthiness was found to be a significant predictor of attitude change, further analysis was conducted including only those respondents who indicated some level of interaction with the Internet in the past 12 months to determine the effect of actual use of the Internet on perceived trustworthiness. The resulting source rankings for perceived source trustworthiness specifically for Internet users (N=111) follows:

1. Government agency staff (M=4.14, SD =0.92)
2. Neighbors and other farmers (M=.3.83, SD =0.95)
3. Internet (M=3.40, SD =1.03)
4. Magazines and other publications (M=3.37, SD =0.91)
5. Newspapers (M=3.11, SD =0.94)
6. Paid consultants (M=3.05, SD =1.33)
7. Radio (M=3.00, SD =0.90)
8. Salesmen and product representatives (M=2.93, SD =1.05)
9. Television (M=2.86, SD =1.03)

A comparison of the perceived level of trustworthiness of information sources between the entire study population and Internet users (as determined by indicating some level of use or interaction with the Internet in the past 12 months) is shown in Table 7.

Table 7. Perceived trustworthiness rankings by all respondents and internet users only

All Respondents (mean score)	Internet Users only (mean score)
1. Government Agency Staff (M=4.08)	1. Government Agency Staff (M=4.14)
2. Neighbors and other Farmers (M=4.02)	2. Neighbors and other Farmers (M=3.83)
3. Magazines and Publications (M=3.37)	3. Internet (M=3.40)
4. Newspapers (M=3.13)	4. Magazines and Publications (M=3.37)
5. Internet (M=3.05)	5. Newspapers (M=3.11)
6. Radio (M=3.02)	6. Paid Consultants (M=3.05)
7. Salesmen and product Reps. (M=2.99)	7. Radio (M=3.00)
8. Television (M=2.88)	8. Salesmen and product Reps. (M=2.93)
10. Paid Consultants (M=2.85)	10. Television (M=2.86)

Among Internet users trustworthiness in the Internet is shown to exceed trustworthiness of ‘magazines and other publications’ and ‘newspapers’ and ranks third behind “government agency staff” and ‘neighbors and other farmers.’ The mean trustworthiness scores for ‘magazines and other publications’ and ‘newspapers,’ as well as all the other sources with the exception of ‘paid consultants’ remained nearly the same among Internet users as compared to all study respondents, however the mean score of the Internet as a trustworthy source increased significantly among users of the Internet (M=3.05 to M=3.40). This would indicate

that trust in the Internet as a soil conservation source does not diminish trust in other sources for this information. Trust in ‘paid consultants’ also saw an actual increase in mean score among Internet users as compared to all respondents (M=2.85 to 3.05).

Discrete Functions of Information Sources

Research Question 2: Are different information sources important at the fact-seeking stage versus the advice-seeking stage in the adoption of soil conservation/protection technologies?

Actual behavioral changes in relation to fact-seeking and advice-seeking from various information sources was determined by asking respondents, “in the past five (5) years have you implemented any new technique or changes in soil conservation/protection in your farming or on your land?” Of the 216 respondents who answered this question, 44% (96 respondents) answered affirmatively; 56% (120 respondents) answered “no.” Those who answered “no” were asked to skip this section of the survey, while those who answered “yes” were asked to continue by recalling which new conservation/protection practice they had implemented. Several respondents recorded more than one practice. Thirty one percent of the time, no-till planting was reported as an adopted conservation practice; 6% of the time the practice was enrollment in CRP; 5% of the time a government subsidized program such as CREP (Conservation Reserve Enhancement Program, WHIP (Wildlife Habitat Incentives Program), or EQIP (Environmental Quality Incentives Program) was reported; and 5% of the time a new grazing technique was indicated. The remaining practices—contour strips, deep-till soybeans, grassed waterways, minimum tillage, run-off containment, double crop, more grasses, weed control/burning, buffer strips, diversion dams, organic farming, stream bank

stabilization, nutrient management, terraces, GPS, manure management plan, removal from CRP program, vehicle trails, windbreaks (trees), and not specified—were each mentioned four or less percent of the time. Respondents were then asked which of the nine information sources they used to find out facts about the practice; then they were asked to indicate which of these sources were the most important sources for finding out facts. They were asked to mark their top three sources. They were also asked to indicate which of the nine information sources they used for advice, and again which of the sources were the top three for giving the best advice. Some respondents (six percent for facts, five percent for most important facts, five percent for advice, and five percent for gave the best advice) filled in additional sources which they used. These sources included books, academic journals, personal experience, seminars, Prairie Enthusiasts, college courses, test plots, and their local co op. The percentage of respondents (of the 96 respondents who answered this set of questions) who used each source for either fact or advice, or used as an important source for facts or for the best advice are listed in Table 8.

Across the four categories—‘used for facts,’ ‘most important sources for facts,’ ‘used for advice,’ and ‘gave the best advice’—percentages were similar for each source, indicating that the same sources were used across the fact-seeking and advice-seeking stages of the decision-making process. The same three sources, in the same order were consistently indicated as the most used sources for fact-seeking and advice-seeking as well as the most important for facts and for giving the best advice. These sources were ‘neighbors and other farmers’, ‘government agency staff’, and ‘magazines and other publications.’ ‘Neighbors and other farmers’ are indicated by 63% of respondents as one of their top three most important

sources of facts, but this number increases slightly to 67% of respondents for one of their top three sources for giving the best advice. However, reported contact with neighbors and other farmers decreased from 81% using for facts to 77% using for advice. ‘Government agency staff’ also are indicated as one of the top three sources of giving the best advice (by 56% of respondents) compared with their use as a top three most important source of facts (53% of respondents) although their level of contact remained nearly constant. ‘Magazine and other publications,’ on the other hand, while ranked highly as a most important source for both facts and advice, were indicated as used quite a bit more as a most important source of facts—43% of respondents indicated ‘magazines and other publications’ as a top three most important source of facts, while only 33% of respondents indicated them as a top three source for giving the best advice. Their level of contact remained constant. ‘Salesmen and product representatives,’ ‘television’ and ‘newspapers’ each saw a slight decrease in moving from “most important source of facts” to “gave best advice,” while ‘radio’ saw a slight increase and ‘paid consultants’ and ‘Internet’ remained steady.

As an indication of the breadth of sources generally used by farmers in making soil conservation/protection decisions, the number of sources used for facts and used for advice was calculated. When indicating the various sources which respondents used for facts or used for advice, participants were asked to ‘mark all that apply.’ Of the nine listed sources, on average 3.5 different sources were indicated as used by each respondent to find out facts about the soil conservation/protection practice (standard deviation=1.81). Similarly, on average 3.5 different sources were used for advice on the practice (standard deviation= 1.92).

Table 8. Information sources used for facts and advice in actual behavior change

Sources		Facts (Q9)			Advice (Q10)		
		Used* (%)	Most Important* (mark top 3 only) (%)	Most Important by Type of Source**	Used* (%)	Gave Best Advice* (mark top 3 only) (%)	Gave Best Advice by Type of Source**
Interpersonal Sources	Neighbors or other farmers	81%	63%	65%	77%	67%	70%
	Salesmen or product reps.	41%	28%		40%	26%	
	Government Agency Staff	68%	53%		69%	56%	
	Paid Consultants	10%	4%		10%	4%	
Impersonal Sources	Radio	17%	7%	27%	22%	8%	22%
	Television	16%	2%		13%	1%	
	Newspapers	28%	11%		29%	6%	
	Magazines & Publications	60%	43%		60%	33%	
	Internet	29%	15%	6%	28%	15%	6%
	Others	6%	5%	2%	5%	5%	2%

*Indicates the percentage of respondents (of N=96) who indicated the respective source for one of their selections under that category (i.e.: used for facts; most important source of facts; used for advice; gave best advice). The sum of percentages exceeds 100% due to multiple answers.

**Percentages based on total number of responses for 'Most Important Source of Facts' or 'Gave Best Advice.' Percentages are compiled by type of source (i.e. Interpersonal, Personal, or Internet, or other).

Interpersonal versus Impersonal Influence

Research Question 3 a): What is the importance of interpersonal interaction versus impersonal intersection with information sources at the various decision stages in soil conservation/protection decisions?

Respondents were asked to indicate their preferences between interacting with *interpersonal* (in person, by phone, meetings, farm demonstrations, and such) or *impersonal* (listening to the radio, reading newspapers, magazines, or websites and such) information sources when *looking for facts* and when *seeking advice* concerning new techniques in soil conservation/ protection. When looking for facts concerning new techniques in conservation/protection, the majority of respondents (61%) reported preferring interpersonal interactions, 11% reported preferring impersonal interactions, and 28% reported that “it doesn’t matter.” See Figure 6.

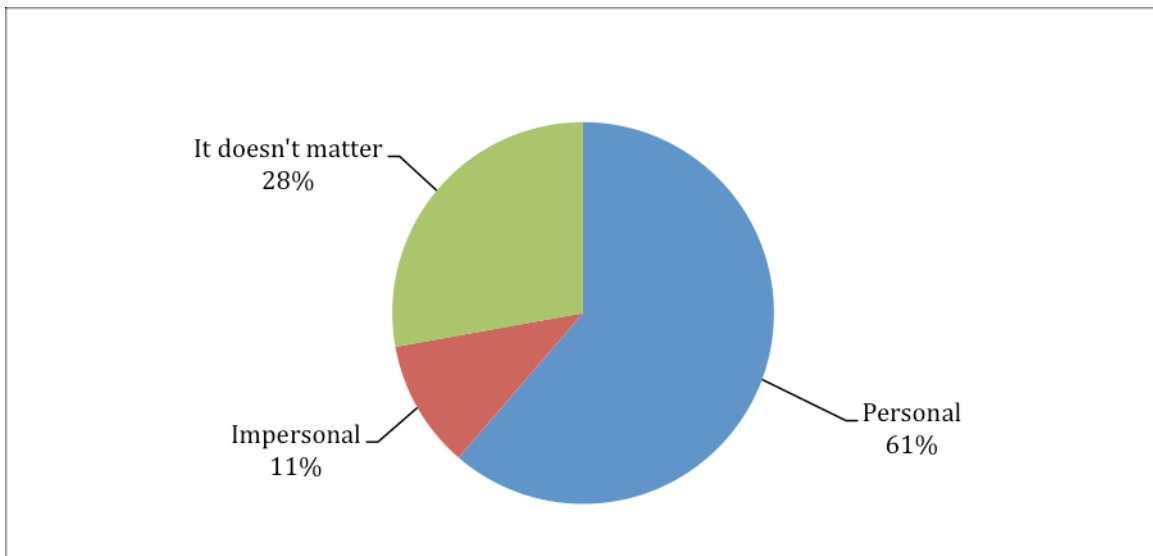


Figure 6. Preferred method for seeking facts (Q11)

Concerning the preferred method for seeking advice concerning new techniques in soil conservation/protection, the majority (69%) of respondents indicated preferring to interact with interpersonal sources; 10% indicated preferring to interact with impersonal sources; and 21% indicated that they had no preference. See Figure 7.

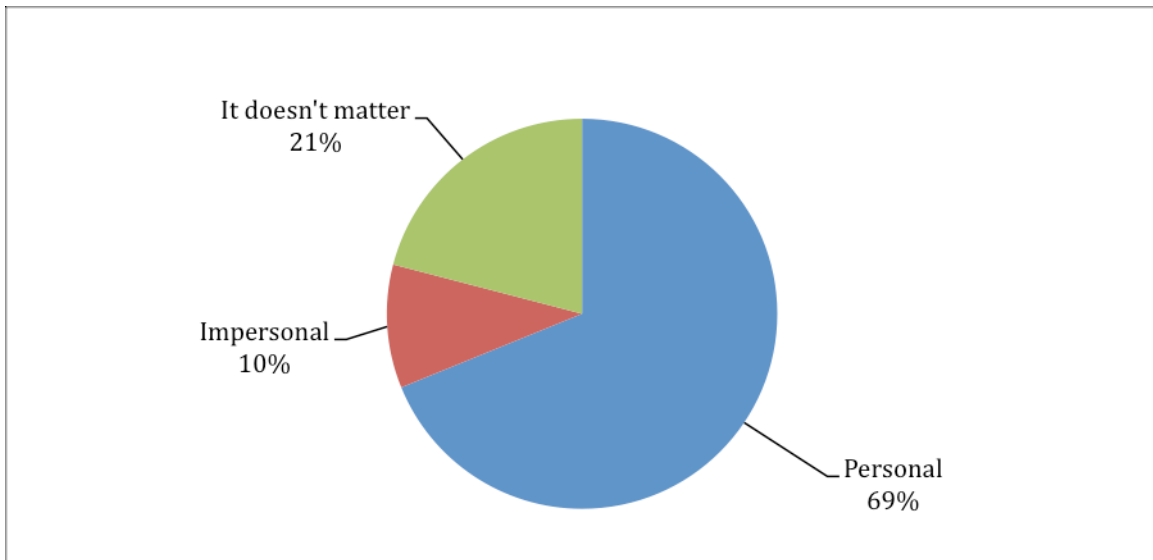


Figure 7. Preferred method for seeking advice (Q12)

The large majorities of respondents who supported the preference for interpersonal interactions in both fact-finding and in advice-seeking toward decisions regarding the implementation of soil conservation/protection were further supported by the numbers of respondents who actually reported interpersonal versus impersonal sources of information as important influencers in past use of soil conservation/protection techniques. Of the respondents who reported having adopted a soil conservation/protection technique in the past five years, 65% of the time an interpersonal information source (including farmers and other neighbors, government agency staff, salesmen or product representatives, and paid consultants) was identified as a most important source of facts. Twenty-seven percent of the

time an impersonal source (including magazines and other publications, newspapers, television, and radio) was given as a most important source of facts; and 6% of the time the Internet was reported (see Table 8). The Internet cannot be included entirely in either group because of its capacity for both impersonal one-way and interpersonal two-way interaction. Likewise, when reporting sources of information that provide the best advice about implementing a new technique in soil conservation/protection, 70% of the time an interpersonal source was indicated, while 22% of the time an impersonal source was indicated, and 6% of the time the Internet was indicated (see Table 8).

This suggests that interpersonal interactions are important for both fact-seeking and in advice-seeking behaviors concerning the adoption of new techniques in soil conservation/protection; however interpersonal relationships are even slightly more important in the advice-seeking stage. Although respondents clearly prefer interpersonal interactions, data suggest that they are using both interpersonal and impersonal information sources throughout the various decision stages. This leads to the next area of inquiry concerning the means through which the interpersonal interaction takes place.

Research Question 3 b): Among interpersonal communications, can the telephone or other communication devices (such as email) replace the value of face-to-face interaction in making decisions about soil conservation/protection practices?

To answer this question respondents were asked directly if communication devices (such as the telephone or email) were just as good as talking face to face with another person when looking for advice about new techniques in soil conservation/protection. Twenty-three

percent of respondents indicated that they either agreed or strongly agreed with this statement; 48% indicated that they either disagreed or strongly disagreed with this statement; and 29% indicated that they neither agree nor disagree with the statement. These percentages are graphically represented in Figure 8. The fact that roughly half (48%) of the respondents disagreed or strongly disagreed that communication devices are as good as face-to-face communication, while only roughly a quarter (23% of respondents) either agreed or strongly agreed with the statement suggests that face-to-face interaction is a quite important element for interpersonal influence.

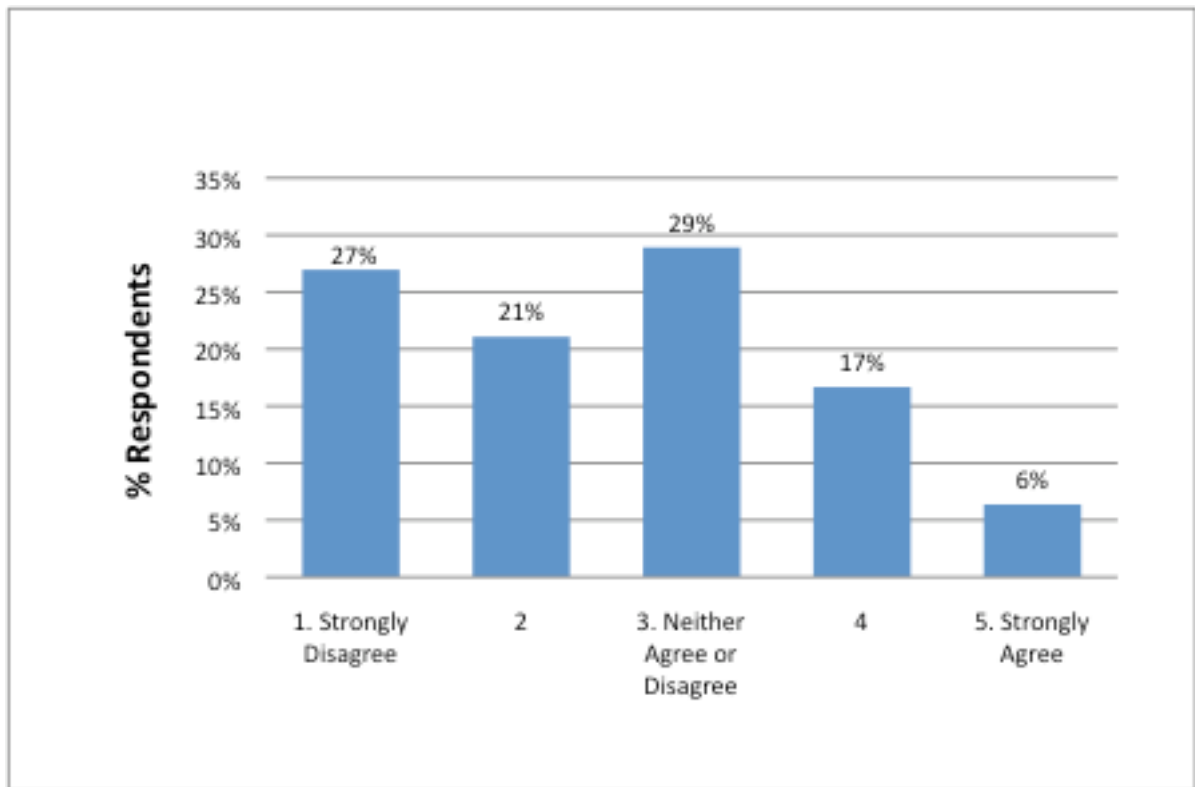


Figure 8. Percent of respondents agreement that communication devices are as good as “face-to-face” interaction

CHAPTER 5: DISCUSSION

This study examined the importance of interpersonal interactions in opinion leadership and the influence of different sources through the stages of the innovation-decision process. Also, answers were sought in the debate over a most influential information source versus a repertoire of important sources in influencing attitude change. In addition, practical areas of inquiry were followed to determine which persons, organizations and/or media sources are important opinion leaders in the area of implementation of soil conservation/protection innovations. The characteristics of such influential entities were examined as was the role of new communication technologies in the innovation process.

Opinion Leaders in Attitude Change

The results of this study yielded consistencies as to the most used sources for fact-seeking and advice-seeking as related to information on new techniques in soil conservation/protection in past behavior and the sources most likely to be influential in shaping attitudes in a hypothetical future situation concerning the introduction of a new technique in soil conservation/protection to the community. The top three information sources in each case were: (1) neighbors and other farmers; (2) government agency staff and (3) magazines and other publications.

This finding is also in general agreement with the findings of previous studies of farmers' attitudes toward conservation issues as cited in the literature review. Both O'Keefe et al. (2002) and Korsching and Hoban (1990) produced similar findings with slight

variation. The noteworthy finding in this case is not the actual rankings of the most used sources; it is the fact that each study, including this study, produced a ‘cluster’ or repertoire of most-used channels which consistently ranked higher than other sources. The repertoire approach is further supported by the numbers of sources which respondents reported using in the various decision stages. In the case of an actual behavior change concerning a soil conservation/protection practice an average of 3.5 different sources were indicated as used by each respondent to find out facts about the implementation of a soil conservation/protection practice and on average 3.5 different sources were used for advice on the practice, supporting a repertoire approach of identifying important channels of conservation information.

Support for this finding has important theoretical implications in the examination of the concept of opinion leadership as well as for practical applications for practitioners in the conservation field. Identifying the repertoire of information sources used by a particular grouping of farmers will aid in the development of most effective conservation campaigns. It is also important to note that neighbors and other farmers are always the most frequently mentioned source for the attitude change measures used in the study. They are most the most frequently used as a general source, and were more frequently mentioned as a “most important source” of facts. They were most frequently mentioned as a source of advice, and were most frequently mentioned as giving “the best advice.” This finding does not provide support for Roger’s (2003) expectations of mass media and interpersonal sources being used in different ways throughout the stages of the decision process as these sources appear to be used in the same ways throughout the stages, This would seem to indicate that despite the fact that there are fewer farmers out there than there used to be, farmers still find it rather

easy to communicate with other farmers about innovations and continue to do so in large numbers.

Source Characteristics in Predicting Attitude Change

Knowing the source characteristics as perceived by community members that predict the influence of opinion leaders is an important area of inquiry. Past studies have established that use of an information source for conservation information is related to a perception of need for such information (O' Keefe et al., 2002) and trust in sources that are most associated with such information (Korsching & Hoban, 1990). The results of this thesis lend support to the notion that perceived trustworthiness is consistently a significant predictor of attitude change and that those sources which are most trusted in the area of conservation information will be most important in adoption decisions. This has particular implications for the Internet as a channel to be used by conservation advocates and government agencies (USDA, Extension and such). The Internet ranked relatively high in perceived trustworthiness—fifth highest in trustworthiness among the nine information sources included in the study—following 'government agency staff,' 'neighbors and other farmers,' 'magazines and other publications,' and 'newspapers' (see Table 2). The Internet also ranked fifth in frequency among the nine sources as a most important source of information for finding facts and providing the best advice as related to actual behavior change (see Table 2). The interesting finding in this case arises from the ranking of the Internet as related to how often it is used and how easy it is to use for farmers. This study revealed that the Internet is not being used by 40% of the study population (see Table 3) and places next to last (only paid consultants

who were used by a very small percentage of the study population, ranked lower) in measures of frequency of use and ease of use (see Table 4). One insightful respondent included this explanation along with her survey:

“In Grant County there is very little high speed internet access so dial-up is fairly common. Using the internet to research ideas can be a long process which many of my neighbors don’t have the time or computer savvy to do.”

Dial-up Internet from a land-based phone line is known to be especially cumbersome and time-consuming; however this trend is changing in many rural areas as broadband Internet is becoming more accessible in the home and transportable as Internet access becomes available through cellular telephones. Future studies will be useful in determining the impact of increased accessibility of the Internet. If trustworthiness in a source is a predictor of attitude change, then it stands to reason that as the Internet (which already enjoys a relatively high perceived trustworthiness) becomes easier to use and is used more frequently by farmers, its level of perceived trustworthiness will increase, and it will be cited more often as influential in fact-seeking and advice-seeking in the innovation decision process toward conservation practices. In fact, Table 7 shows that when current users of the Internet were analyzed separately from all respondents, the perceived trustworthiness of the Internet was greatly increased—ranking above ‘magazines and other publications’ as the third most trusted source.

Discrete Functions of Information Sources

Several details of interest arose from the ranking of the sources used and the sources considered most important in fact-seeking and in advice-seeking. One interesting finding is that landowners did not seem to distinguish greatly between fact-seeking and advice-seeking. This may be because these information sources are filling simultaneous roles for the respondents. Another interesting finding is the relationship between use of a source for facts and advice and the indication of that source being a ‘most important’ source for facts or advice. Results were fairly consistent that the sources used most were also indicated as most important sources in the decision to adopt the behavior, supporting the idea that sources used more often for conservation information will be the most influential sources in making adoption decisions. This study also shows that many information sources are used throughout all the decision stages of the adoption process, although the importance of certain sources do tend to increase or decrease as landowners use the sources for different functions. For instance ‘neighbors and other farmers’ are indicated by 63% of respondents as one of their top three most important sources of facts, but this number increases to 67% of respondents for one of their top three sources for giving the best advice. However this trend is complicated when examining use of sources for facts and advice, where reported contact with neighbors and other farmer decreased from 81 % to 77%. ‘Government agency staff’ also are indicated as one of the top three sources of giving the best advice (by 56% of respondents) compared with their use as a top three most important source of facts (53% of respondents) although their level of contact remained nearly constant. ‘Magazine and other publications,’ on the other hand, while ranked highly as a most important source for both

facts and advice, were indicated as used quite a bit more as a most important source of facts—43% of respondents indicated ‘magazines and other publications’ as a top three most important source of facts—while only 33% of respondents indicated them as a top three source for giving the best advice. Their level of contact remained constant. ‘Salesmen and product representatives,’ ‘television’ and ‘newspapers’ each saw a slight decrease in moving from “most important source of facts” to “gave best advice,” while ‘radio’ saw a slight increase and ‘paid consultants’ and ‘Internet’ remained steady.

The data in this study suggest that landowners do use many information sources for both fact-seeking and advice-seeking in decisions to adopt innovations in soil conservation/protection, and the top three sources are important throughout the stages.

Interpersonal versus Impersonal influence

When looking for facts and when seeking advice concerning new techniques in conservation/protection, the majority of respondents (61% and 69%, respectively) reported preferring interpersonal interactions, 11% reported preferring impersonal interactions when seeking facts and 10% preferred impersonal interactions when seeking advice. The remaining respondents indicated that they had no preference. The large majorities of respondents who supported a preference for interpersonal interactions in both fact-finding and in advice-seeking toward decisions regarding the implementation of soil conservation/protection were further supported by the numbers of respondents who actually reported interpersonal versus impersonal sources of information as important influencers in past use of soil conservation/protection techniques. Among indicated responses from

landowners who reported having adopted a soil conservation/protection technique in the past five years, 65% of the responses under “most important source of facts” were for an interpersonal information source (including ‘farmers and other neighbors,’ ‘government agency staff,’ ‘salesmen or product representatives,’ and ‘paid consultants’), 27% of the responses were for impersonal sources and 6% were the Internet. For “gave the best advice,” 70% of the responses were for an interpersonal source, 22% were for an impersonal source, and 6% were for the Internet (See Table 8).

This suggests that interpersonal interactions are important for both fact-seeking and in advice-seeking behaviors concerning the adoption of new techniques in soil conservation/protection; however, interpersonal relationships are slightly more important in the advice-seeking stage. Although respondents clearly favored interpersonal sources when forced to choose, in reality farmers are clearly using both interpersonal and impersonal sources as supported by the data in this study. This leads to the next area of inquiry concerning the means through which the interpersonal interaction takes place.

When respondents were asked if communication devices (such as the telephone or email) were just as good as talking face to face with another person when looking for advice about new techniques in soil conservation/protection, only 23% of respondents agreed with the statement, while 48% of respondents expressed disagreement, suggesting that face-to-face interaction is an important element for interpersonal influence. Twenty-nine percent of respondents neither agreed nor disagreed that communication devices are as good as face-to-face interaction when making conservation decisions. Most likely in a perfect world, farmers would prefer face-to-face interactions as indicated by the data, although they may not always

have this luxury of talking to one another directly and in these instances are substituting telephone or email. This finding has important implications for some of the new communication technologies such as the cellular telephone and the Internet. For practitioners and agencies working in the soil conservation field, this finding indicates that such means may be adequate for maintaining the some of the interpersonal interactions which are preferable to farmers in the adoption decision process, although non-mediated interactions remain important. More research could prove successful in refining the opinions of the large number of respondents who neither agreed nor disagreed with this statement. In addition, more research could be used to determine the perceived differences in mediating devices (i.e. the telephone versus email). As the Internet becomes more widely used in rural areas, many agencies may find that they can benefit from the savings in staff time and cost by interacting with landowners through these 'electronically personal' methods.

Important Contributions

The farming community is a unique and specialized segment of the population and this study purports several important and valid findings based on a relatively high response rate (48%) from a mail survey and a diversity of respondents based on such demographic factors as age, income, acreage farmed, educational level, and type of farm. This study has taken the recommendations of past researchers to include the Internet as a new important variable in studying source use and environmental decision-making. The study also included a hypothetical scenario line of questioning in order to gauge farmers' future attitude change based on the recommendations of various sources in order to rectify recall error associated with past studies.

This study contributes several unique insights to the notion of opinion leadership in a contemporary farm community. It provides a snapshot of the communications and influencers at work in such a community. This study integrates several theoretical perspectives and new communication technologies in order to best describe the state of opinion leadership in a contemporary farm community. The purpose of this study is to neither prove nor disprove past theoretical ideas concerning opinion leadership, but to use these perspectives to discuss and describe how such ideas are playing out in a community on the verge of large-scale adoption of the Internet. This study will serve well as a “base-line” study concerning such adoption.

One of the most important findings of this study relates to the perception of the level of trustworthiness which the Internet enjoys as related to its accessibility. Perceived trustworthiness has been shown to be related to the influence of a source and the Internet enjoys a relatively high level of perceived trustworthiness compared to its accessibility among the study population. However, when those respondents who have indicated some level of interaction with the Internet in the past 12 months are analyzed separately from all study respondents, the level of perceived trustworthiness of the Internet greatly increases, exceeding the trustworthiness of ‘magazines and other publications’ and ‘newspapers.’ Therefore, one would venture that as broadband Internet becomes more pervasive in rural communities, it will soon attain an important role in adoption decisions toward conservation practices. Conservation practitioners, researchers, and farmers would do well to keep an eye on these trends because they will likely influence the way decisions toward conservation practices are reached.

The findings in this study also pose a word of caution to those who are overly expectant of the role of the Internet to supersede the need for interpersonal face-to-face communications with farmers. This study shows a strong preference for such interactions in the adoption-decision process and this preference is not likely to be readily and immediately altered by the presence and accessibility of the Internet. Interpersonal face-to-face interaction remains very important to farmers in conservation decision-making.

Limitations and Suggestions for Future Research

This study provided an important look at opinion leadership related to soil conservation/protection activities in a contemporary farm community by including new communication technologies in an examination of traditional opinion leadership perspectives. A diverse and well-represented sample responded to the survey as indicated by the response rate to the survey and the demographics represented.

The study was limited by the geographic region in which it was conducted. Several features unique to the Grant County, Wisconsin, study population would make it useful to perform similar studies in other regions to determine the generalizability of the findings. As indicated in the study, the area consists of farms averaging approximately 300 acres. In other geographic regions farmed acreages are much larger, likely producing a different repertoire of influential sources. In particular, 'paid consultants' are likely to be more influential on large acreages or on farms producing specialty crops where use and reliance on consultants is more prevalent than in this study population. Because so few of the study participants had used paid consultants, their credibility ratings in this study are likely to be skewed and future

studies in alternative locales are likely to produce different findings. In addition, as this study revealed, the Internet (especially high speed Internet) has yet to be diffused through the farm community. Studies should be completed in other agricultural regions where access to high speed internet is greater in order to compare findings. In addition it would be helpful to complete such a study in a community where an actual new conservation technology is currently being introduced so that a real-time look at opinion leaders and related information usage can be examined without the limitation of respondents' recall.

Farmers clearly show a preference for face-to-face interactions in adoption decisions about soil conservation/protection practices when given a choice. However this study did not measure actual behavior toward using face-to-face versus mediated interpersonal devices such as telephone or email. Future studies to measure actual behavior will prove valuable. It will also be valuable in future studies to determine how the Internet is being used among farmers—which sources they are drawing upon through the Internet, and if the Internet is acting as a replacement for or in complement to other sources such as newspapers, magazines or other farmers.

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APPENDIX

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

College of Liberal Arts and Sciences
Greenlee School of Journalism
and Communication
101 Hamilton Hall
Ames, Iowa 50011-1180
515 294-4342
FAX 515 294-5108

June 4, 2009

Dear Grant County Landowner:

I'm a graduate student at Iowa State University in the journalism and mass communications program. I'm currently working on a Master's thesis about the information sources that rural landowners use to find information about soil conservation and other environmental practices that they might use on their land. This important study will be useful in learning about ways of making the information farmers and landowners need more available to them.

This survey is intended to collect opinions from the person who makes decisions on how the land you own is used or farmed. If you are not the person who makes these decisions, I would greatly appreciate you passing this survey on to the person who does make these decisions.

Your participation in this survey is completely voluntary and you are free to skip any questions you do not feel comfortable answering. If you do participate in this survey, your answers will be held in the strictest confidence and will not be linked in any way to you as an individual. Only a summary of all the participants' results will be included in my final thesis.

If you choose to fill out this survey it should take about 5-10 minutes of your time. You will be eligible to be entered in a drawing to win \$50.00 for completing the survey. I will contact you by mail if you are selected as the winner of the \$50.00.

If you have any questions about this survey feel free to contact me at (608) 354-8539 or tenz@iastate.edu or you may contact my advisor, Dr. Suman Lee at (515) 294-0496 or smlee@iastate.edu.

I would greatly appreciate your help with this important project.

Tammy Enz
Master's Student
Greenlee School of Journalism and Mass Communications
Iowa State University

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

College of Liberal Arts and Sciences
Greenlee School of Journalism
and Communication
101 Hamilton Hall
Ames, Iowa 50011-1180
515 294-4342
FAX 515 294-5108

June 18, 2009

Dear Grant County Landowner:

A few weeks ago I sent you a survey about the information sources that rural landowners use to find information about soil conservation and other environmental practices that they might use on their land. I haven't heard back from you yet, but I'm greatly interested in your opinions. This important study will be useful in learning about ways of making the information farmers and landowners need more available to them.

This survey is intended to collect opinions from the person who makes decisions on how the land you own is used or farmed. If you are not the person who makes these decisions, I would greatly appreciate you passing this survey on to the person who does make these decisions.

Your participation in this survey is completely voluntary and you are free to skip any questions you do not feel comfortable answering. If you do participate in this survey, your answers will be held in the strictest confidence and will not be linked in any way to you as an individual. Only a summary of all the participants' results will be included in my final thesis.

If you choose to fill out this survey it should take about 10 minutes of your time. You will be eligible to be entered in a drawing to win \$50.00 for completing the survey. I will contact you by mail if you are selected as the winner of the \$50.00.

If you have any questions about this survey feel free to contact me at (608) 354-8539 or tenz@iastate.edu or you may contact my advisor, Dr. Suman Lee at (515) 294-0496 or smlee@iastate.edu.

I would greatly appreciate your help with this important project.

Tammy Enz
Master's Student
Greenlee School of Journalism and Mass Communications
Iowa State University

GRANT COUNTY LANDOWNER OPINION SURVEY

1. For how many years have you owned land in Grant County?

_____years

2. Please circle the number that best describes how you currently use the majority of the land you own in Grant County.

1 I actively farm the land

2 I rent the land to someone else to farm **AND** I am involved in decisions on how the land is farmed.

3 I rent the land to someone else to farm **AND** I am **NOT** involved in decisions on how the land is farmed. (**STOP** here and send back the survey or pass it on to the person who does make the decisions.)

4 Other (specify) _____

3. What is the approximate number of acres in Grant County you intend to farm and/or manage during 2009? (Please include land you own and land you rent from someone else).

Total acres owned and rented _____acres

4. How often in the past 12 months have you used or interacted with the following information sources?

	Never.....	Often	Very Often	Doesn't Apply
NEIGHBORS OR OTHER FARMERS (face-to-face, phone, or email)	0	0	0	0
SALESMEN OR PRODUCT REPRESENTATIVES	0	0	0	0
RADIO	0	0	0	0
TELEVISION	0	0	0	0
NEWSPAPERS	0	0	0	0
MAGAZINES AND OTHER PUBLICATIONS	0	0	0	0
INTERNET	0	0	0	0
GOVERNMENT AGENCY STAFF (such as FSA or County Land Conservation or UW Extension)	0	0	0	0
PAID CONSULTANTS	0	0	0	0
OTHERS (Please Specify) _____	0	0	0	0

5. How easy to use do you believe the following information sources are for you?

	Not At All Easy.....	Easy	Very Easy	Doesn't Apply
NEIGHBORS OR OTHER FARMERS (face-to-face, phone, or email)	0	0	0	0
SALESMEN OR PRODUCT REPRESENTATIVES	0	0	0	0
RADIO	0	0	0	0
TELEVISION	0	0	0	0
NEWSPAPERS	0	0	0	0
MAGAZINES AND OTHER PUBLICATIONS	0	0	0	0
INTERNET	0	0	0	0
GOVERNMENT AGENCY STAFF (such as FSA or County Land Conservation or UW Extension)	0	0	0	0
PAID CONSULTANTS	0	0	0	0
OTHERS (Please Specify) _____	0	0	0	0

6. For this question, imagine that a **new technique in soil conservation/protection** is being introduced to your community.

If the **cost of this new technique was not an issue**, how **likely** is it that you would **change the way you feel about using** the new technique based on the recommendations of the following information sources?

	Very Unlikely.....Likely					Doesn't Apply
NEIGHBORS OR OTHER FARMERS (face-to-face, phone, or email)	○	○	○	○	○	○
SALESMEN OR PRODUCT REPRESENTATIVES	○	○	○	○	○	○
RADIO	○	○	○	○	○	○
TELEVISION	○	○	○	○	○	○
NEWSPAPERS	○	○	○	○	○	○
MAGAZINES AND OTHER PUBLICATIONS	○	○	○	○	○	○
INTERNET	○	○	○	○	○	○
GOVERNMENT AGENCY STAFF (such as FSA or County Land Conservation or UW Extension)	○	○	○	○	○	○
PAID CONSULTANTS	○	○	○	○	○	○
OTHERS (Please Specify) _____	○	○	○	○	○	○

7. Indicate **how much you agree** with the following statement:

“The telephone or other communication devices (such as email) are just as good as talking face-to-face with another person when I am looking for advice about new techniques in soil conservation/protection.”

Strongly Disagree **Neither Agree nor Disagree** **Strongly Agree**

○ ——— ○ ——— ○ ——— ○ ——— ○

8. In the past **five (5)** years have you implemented any new technique or changes in soil conservation /protection in your farming or on your land?

1 Yes _____
If yes, what was the practice you used? _____

2 No _____ (if No, skip to Question #11)

9. Indicate which sources you used to **find out facts** about the new technique in question #8. Check **all sources you used to find out facts**. Then check the **most important source or sources that you used to find out facts**.

	I used for facts (mark all that apply)	Most important source(s) of facts (mark top 3)
NEIGHBORS OR OTHER FARMERS (face-to-face, phone, or email)	0	0
SALESMEN OR PRODUCT REPRESENTATIVES	0	0
RADIO	0	0
TELEVISION	0	0
NEWSPAPERS	0	0
MAGAZINES AND OTHER PUBLICATIONS	0	0
INTERNET	0	0
GOVERNMENT AGENCY STAFF (such as FSA or County Land Conservation or UW Extension)	0	0
PAID CONSULTANTS	0	0
OTHERS (Please Specify) _____	0	0

10. Indicate which sources you used to **get advice** about the new technique in question #8. Check **all sources you used for advice**. Then check **the source or sources that you felt gave the best advice**.

	I used for advice (mark all that apply)	Gave the best advice (mark top 3)
NEIGHBORS OR OTHER FARMERS (face-to-face, phone, or email)	0	0
SALESMEN OR PRODUCT REPRESENTATIVES	0	0
RADIO	0	0
TELEVISION	0	0
NEWSPAPERS	0	0
MAGAZINES AND OTHER PUBLICATIONS	0	0
INTERNET	0	0
GOVERNMENT AGENCY STAFF (such as FSA or County Land Conservation or UW Extension)	0	0
PAID CONSULTANTS	0	0
OTHERS (Please Specify) _____	0	0

11. When looking for **FACTS** about a new technique in soil conservation/protection, do you **PREFER** to interact with information sources:

- 1 On a **PERSONAL** level (in person, by phone, meetings, farm demonstrations, etc)
- 2 On an **IMPERSONAL** level (listening to radio, reading newspapers, magazines, or websites, etc.)
- 3 It doesn't matter

12. When looking for **ADVICE** about a new technique in soil conservation/protection, do you **PREFER** to interact with information sources:

- 1 On a **PERSONAL** level (in person, by phone, meetings, farm demonstrations, etc)
- 2 On an **IMPERSONAL** level (listening to radio, reading newspapers, magazines, or websites, etc.)
- 3 It doesn't matter

13. How **knowledgeable** do you find each of these sources in terms of their ability to give you information **about techniques in soil conservation/protection?**

	Not At All Knowledgeable.....able					Very Knowledgeable	Doesn't Apply
NEIGHBORS OR OTHER FARMERS (face-to-face, phone, or email)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
SALESMEN OR PRODUCT REPRESENTATIVES	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RADIO	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
TELEVISION	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NEWSPAPERS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MAGAZINES AND OTHER PUBLICATIONS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
INTERNET	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GOVERNMENT AGENCY STAFF (such as FSA or County Land Conservation or UW Extension)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PAID CONSULTANTS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
OTHERS (Please Specify) _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

