

Identifying Extension Information Delivery Methods For Environmental Issues

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The primary purpose of this study was to identify the types of information sources that farmers find useful, and the human resource organizations they depend upon when confronted with environmental issues. This study utilized a descriptive survey research using 379 randomly selected Pennsylvania farmers. A response rate of 65 percent was achieved for the study.

The findings indicated that educational activities such as on-farm consultations, demonstrations, tours, and plots were the most useful information sources to learn about environmental issues. Public meetings, newsletters, and magazines were also identified as useful sources of information. Soil Conservation Service, Penn State county Extension personnel, Penn State University faculty, and County Conservation Districts were rated most useful human resource organizations to depend upon when confronted with environmental issues.

Introduction

Previous researchers have documented the value of various communication methods in disseminating information to farmers. Fedele (1985) suggested that infor-

mation delivery is done by a number of methods. These methods are used in a variety of ways and in a number of contexts, depending on the needs of the farmers. In addition, a number of studies have indicated that

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farmers use different communication methods for their information needs through a variety of sources (Kramic, 1987; Martin & Oomer, 1988; Padgitt, 1987; Bounaga, 1989; Richardson, 1989; Bouare & Bowen, 1990 and Bruening, 1990). For Extension educators and communicators, it is particularly important to identify the usefulness of particular information sources and the channels for disseminating information to farmers. Information relative to these sources and channels will not only help in identifying the information needs of farmers, but will also assist in developing educational programs to effectively communicate with farmers.

Related Literature

A host of media and methods are used by Extension educators to communicate new and emerging technologies to farmers. For example, print-based information serves the public with specific answers to a myriad of topics. Audio-visual methods, such as audio and video tapes, often provide information without personally involving agents. Mass media delivery methods such as radio, television, and newspaper are used to advertise events, anticipate client needs, and report agricultural business information (Fedele, 1985). Kramic (1987) indicated that Ohio farmers ranked meetings and clinics conducted by Extension agents first, both in importance and confidence. Furthermore, these farmers also ranked Extension bulletins and newsletters first in confidence and content accuracy. North Carolina farmers (Richardson, 1989) very often preferred newsletters, meetings, farm visits, telephone calls, and on-farm tests. However, newer information delivery techniques such as teleconferencing, video tapes,

audio-cassettes, and cable television were not preferred by these farmers.

Okai (1986) found that small-scale farmers in Missouri were satisfied with the source of agricultural information made available to them. When presented with a list of eight information sources, Missouri farmers ranked Extension education assistants, Extension publications, friends and neighbors, radio, and television as the top four information sources. Vocational agriculture instructors and area Extension specialists were ranked lowest.

Padgitt (1987) found that over 60 percent of Iowa farm operators used farm magazines/newspapers, radio, and television as sources to obtain information on groundwater quality. Cooperative Extension Service (CES), Soil Conservation Service, soil conservation districts, and university Extension specialists were also cited as major information providers regarding groundwater quality. However, regarding the reliability of information delivered, university Extension specialists, CES, Soil Conservation Service, soil conservation district personnel, and the state natural resource agency personnel were considered most reliable. Local agricultural dealers, chemical representatives, and radio and television were considered the least reliable sources.

In a study conducted by Bounaga (1989), landowners of highly erodible soils in Iowa preferred neighbors, friends, family and other farmers, the Soil Conservation Service, Agricultural Stabilization and Conservation Service, the CES, and agribusinesses as major information sources. In addition, when asked to rate the education methods for past and future use, landowners gave high ratings for "face to face discussions." Newspapers and magazine articles,

and newsletters were rated second and third in respective importance. The landowners who had not started a conservation plan rated three educational methods (newsletters, tours and demonstrations, and self study) significantly lower than those who had a conservation plan.

Bouare & Bowen (1990) found that office calls, telephone calls, bulletins, and newsletters were the methods used most often by Ohio Extension agents to deliver instruction to farmers. Methods least used were radio, television, magazines, and teleconferencing. Furthermore, they also found strong agreement between the methods the agents used with farmers and what they (agents) perceived to be most appropriate method(s) to use.

Few researchers have examined the relationships between farmers' demographic characteristics and their information needs. Okai (1986) found significant differences between education levels and acres owned by farmers and the importance of information needs. Farmers with higher education levels sought more professional information. Farmers with large acreages relied more on newspapers and magazines when compared to farmers with small acreages. Further, years of farming was independent of the farmer's perceived importance of various information sources. Similar findings were reported by Bounaga (1989) for landowners in Iowa. Landowners who were 66 years or older preferred telephone conference and satellite television methods more frequently than did younger farmers. Landowners who had a high school education rated the importance of educational methods significantly higher than landowners who had more than a high school education.

Purpose and Objectives

Researchers have not formally examined the information needs of Pennsylvania farmers relative to environmental issues. Thus, the purpose of this study was to identify the types of information sources farmers find most useful and to determine the human resources they depend upon when confronted with environmental issues. The specific objectives of this study were to determine:

1. The types of information sources farmers find most useful regarding environmental issues.
2. The perceptions of farmers regarding the usefulness of human resource organizations (HROs) extending information on environmental issues.
3. Relationships between farmers' perceptions of the usefulness of information sources and their age, education level, years of farming, and type of farming.
4. Relationships between farmers' perceptions of usefulness of human resource organizations and their age, education level, years of farming, and type of farming.

Methods and Procedures

This study represents descriptive survey research. The target population for the study included all 23,481 Pennsylvania farmers listed in the Agricultural Stabilization and Conservation Service mailing list for six counties (Adams, Chester, Dauphin, Lancaster, Lebanon and York) in southeastern Pennsylvania. A random sample of 374 farmers was selected which provided no more than a 5 percent sampling error at the 95 percent level of confidence (Krejcie & Morgan, 1970).

Data for this study were collected through a mailed questionnaire consisting of four sections.

Section one contained 30 statements which measured farmers' perceptions regarding environmental issues. The items were measured on a five-point, Likert-type scale that ranged from one "strongly disagree" to five "strongly agree." Section two elicited information on farm characteristics such as acres owned, crop acres, livestock, soil tests, manure tests, and soil conservation practices. Section three contained statements designed to gather demographic information such as age, education level, years of farming, type of farming, retirement, and farming plans. Section four gathered information regarding the usefulness of information sources and human resource organizations. These were measured on a five-point, Likert-type scale that ranged from one "no use at all" to five "very useful."

The questionnaires were mailed to the sample during the last week of March 1990. After two follow-ups, a total of 246 farmers responded, yielding a return rate of 65 percent. Because nonrespondents tend to be similar to late respondents (Miller & Smith, 1983), farmers who responded during the first four weeks were compared with those responding during the last four weeks. No significant differences ($p > .05$) were found between early and late respondents on most dependent variables measured in the study. However, significant differences ($p < .05$) were found between early and late respondents on five statements that measured farmer's perceptions about environmental issues.

Data were analyzed using frequencies, means, percentages, and correlations. The questionnaire was found to have acceptable reliability (Cronbach's alpha = .88).

Findings

Demographic Profile of Pennsylvania Farmers. The mean age of farmers responding was 53 years, ranging from a low of 21 years to a high of 84 years. Almost two-thirds of the farmers had completed at least twelve years of formal education while the remainder had some postsecondary education. Farmers indicated that they had been farming on the average for more than 25 years (26.6). Almost one-third of the farmers had been farming for more than 30 years. Farmers indicated that an almost equal percentage of them were farming either full-time (52 percent) or part-time (48 percent). Almost half of the farmers indicated they were planning to retire sometime within the next ten years. Almost a third of the farmers indicated that they plan on farming for the next five years.

Usefulness of Information Sources (Objective 1). The farmers were asked to indicate the usefulness (1 = of no use at all and 5 = very useful) of various information sources about groundwater quality. The information sources were grouped for presentation purposes into three categories: printed material, audio-visual sources, and educational activities. Results are found in Figure 1. Information sources that farmers found somewhat useful in the printed material category were newsletters (mean = 3.95) followed by manuals (mean = 3.82), magazines (mean = 3.80), brochures (mean = 3.73), and technical notes-fact sheets (mean = 3.69). However, farmers were uncertain about the usefulness of newspapers (3.51).

In the audio-visual category, farmers indicated video (mean = 3.64) and photographs and charts (mean = 3.60) as useful information sources.

The farmers were uncertain about the usefulness of radio (mean = 2.95) as a source of information.

On-farm consultations (mean = 4.18), demonstrations, tours and plots (mean = 4.12), and public meetings (mean = 3.84) were the information sources that farmers found useful in the educational activities category. However, the farmers were more or less uncertain about the usefulness of trade shows (mean = 3.29).

By major information source categories, Pennsylvania farmers indicated educational activities (mean = 3.84) as the most useful information source followed by print

material (mean = 3.75) and audio-visual sources (mean = 3.41).

Usefulness of Human Resource Organizations (Objective 2). The farmers were asked to indicate the usefulness of human resource organizations in extending information relative to environmental issues. The response scale ranged from one to five, with one being "no use at all" and five "very useful." Results are found in Figure 2. The results indicated that Pennsylvania farmers ranked the Soil Conservation Service (mean = 4.26) as the most useful human resource organization followed by Penn State Cooperative Extension county offices (mean

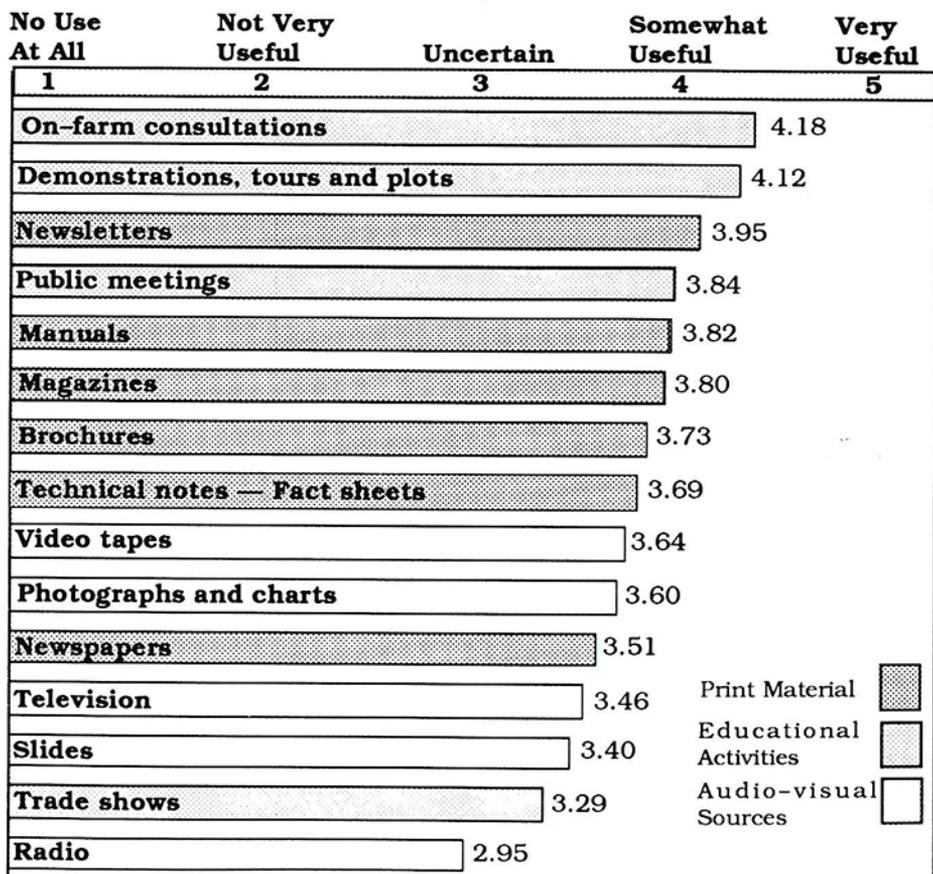


Figure 1: Usefulness of Information Sources

=4.17), Penn State University faculty (mean = 3.98), county conservation districts (mean = 3.94), and the Agricultural Stabilization and Conservation Service (ASCS) (mean = 3.82). However, the farmers were uncertain about the usefulness of organizations such as the Environmental Protection Agency (EPA) (mean =

2.87), Department of Environmental Resources (DER) (mean = 2.81), and machinery dealers (mean = 3.08).

Relationships Between Usefulness and Demographic Factors (Objectives 3 and 4).

Point-biserial correlation coefficients ($r_{pt\ bis}$) were computed to determine if relationships existed be-

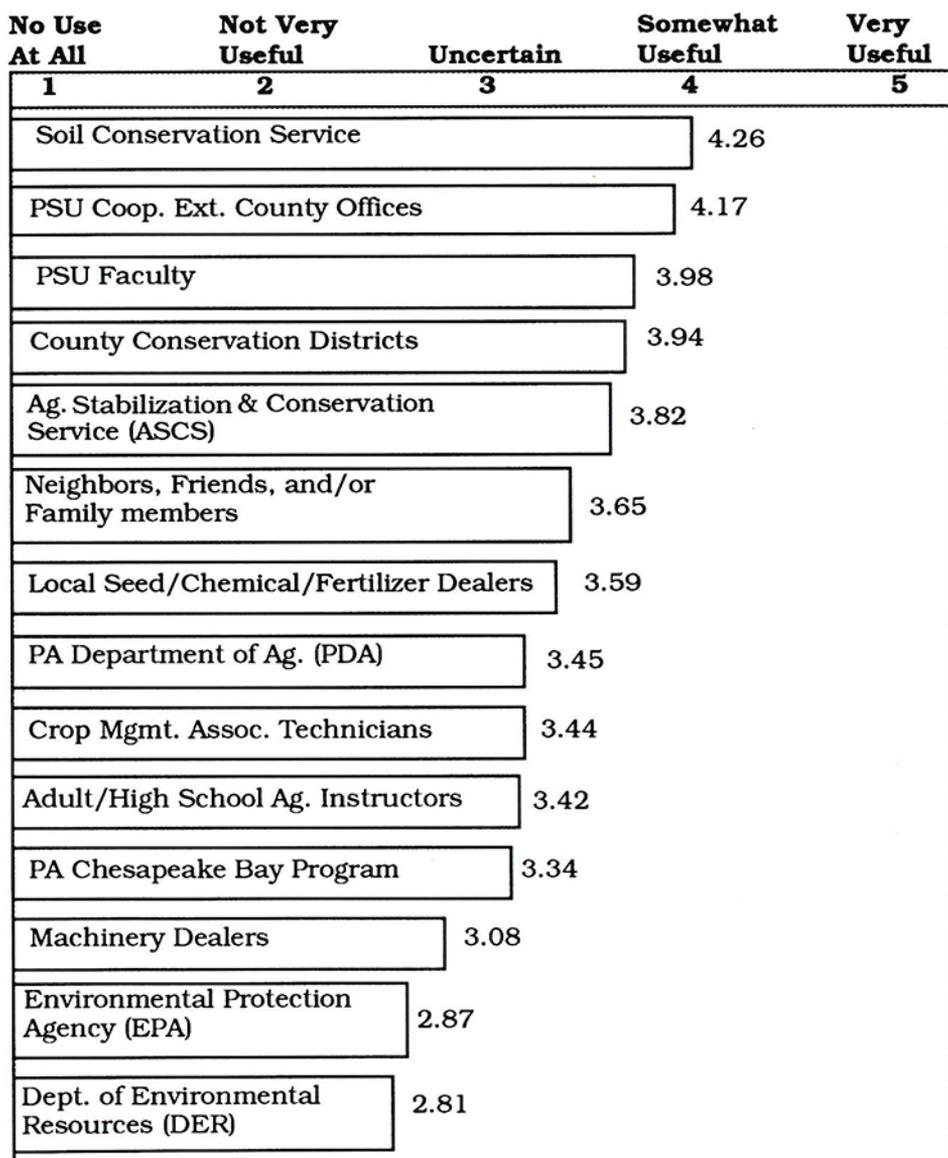


Figure 2: Usefulness of Human Resource Organization

tween the usefulness of information sources and demographic characteristics such as age, educational level, years of farming, and type of farming. In addition, relationships between the usefulness of human resource organizations and demographic characteristics (age, educational level, years of farming, and type of farming) were also analyzed. Only significant relationships ($p \leq .05$) are discussed. Terms used to describe the relationships were selected from Davis (1971).

Data in Table 1 indicated a low negative relationship ($r = -.19$) existed between years of farming and usefulness of educational activities. A low positive relationship ($r = .19$), significant at the .05 level, existed between audio-visual sources of information and farmers' education level. Further, the perceived usefulness of the three information sources were not associated with farmer's age and whether or not they are part-time farmers or full-time farmers.

Low positive relationships ($r = .16$ and $r = .18$) existed between the age of respondents and usefulness of human resources such as machinery dealers and Pennsylvania Department of Agriculture (Table 2). A low positive relationship ($r = .21$) existed between the educational level of farmers and the usefulness of

Penn State University faculty as resources for gaining information. However, a low negative relationship ($r = -.22$) was found between the educational level of farmers and the usefulness of local seed/chemical/fertilizer dealers. The perceived usefulness of human resource organizations was not associated with years of farming. Further, a low positive relationship ($r = .17$ and $r = .19$) existed between the type of farming and the usefulness of human resource organizations such as Environmental Protection Agency and Department of Environmental Resources, as providers of information on environmental issues.

Conclusion and Discussion

The findings of this study suggest that Pennsylvania farmers found most useful educational activities such as on-farm consultations and demonstration tours and plots as communication methods for obtaining information about environmental issues. This finding confirms that farmers believe what they see and provides additional substantiation that "seeing is believing." In addition, Pennsylvania farmers also found useful printed materials such as newsletters, manuals, and magazines as sources to learn about environmental issues. This finding closely

Table 1:
Relationships (r pt. bis) Between Usefulness of Information Sources and Demographic Characteristics.

Information Sources	Age	Education Level	Years of Farming	Type of Farming
Printed Materials	.01	.05	-.11	.02
Audio Visuals	.04	.19*	-.08	.15
Educational Activities	-.15	.10	-.19*	-.01

* $p < .05$

matches those of Iowa and North Carolina farmers (Bruening, 1990; Bounaga, 1989; Richardson; 1989, and Padgitt, 1987).

Pennsylvania farmers ranked the Soil Conservation Service, Penn State Cooperative Extension county offices, Penn State University faculty, county conservation districts, and ASCS as the most useful human resource organizations to gain information about environmental issues. In addition, neighbors, friends, family members, and local seed/chemical/fertilizer dealers were also considered useful resources for gaining information. However, it is interesting to note that Pennsylvania farmers were most uncertain about Department of Environmental Resources personnel and Environmental Protection Agency personnel as useful resource organizations relative to providing information for environmental issues. The findings of Bruening (1990) closely parallel most of the findings resulting from this study of Pennsylvania farmers. Similar findings were reported by Padgitt (1987) and Bounaga (1989). Further, the evidence from these studies indicate that farmers rely extensively upon both private and public sources to

gain information on environmental issues.

Farmers who received more than a high school education reported audio visuals as useful information sources more so than those farmers who had not completed high school. Farmers with less than 26 years experience indicated educational activities such as on-farm consultations, and demonstration tours and plots, more useful than those farmers who had been farming more than 26 years.

Farmers with more than a baccalaureate degree considered Penn State University faculty as useful human resources to gain information on environmental issues. However, it is interesting to note that these same farmers did not consider seed/chemical/fertilizer dealers as useful human resource organizations to gain information on environmental issues. Older farmers (over 53 years of age) considered machinery dealers and Pennsylvania Department of Agriculture personnel as more useful human resource organizations than younger farmers. Both EPA and DER were considered as more useful human resource organizations by part-time farmers than by

Table 2:
Relationships (r pt. bis.) Between Usefulness of Human Resource Organizations and Demographic Characteristics.

Human Resource Organizations	Age	Education Level	Years of Farming	Type of Farming
Penn State Faculty	.07	.21*	.02	.04
Machinery Dealers	.16*	-.13	.15	-.12
Seed/Chemical/Fertilizer Dealers	.02	-.22*	.15	-.12
Environmental Protection Agency	.11	-.05	.06	.17*
Dept. of Environmental Resources	.10	.01	-.01	.19*
Pennsylvania Dept. of Agriculture	.18*	-.06	.10	.12

* $p < .05$

full-time farmers. The findings of this study do not follow the findings of Bounaga (1989) and Okai (1986).

Recommendations

The findings and conclusions provided a basis for the following recommendations.

1. Extension educators and communicators should use the findings of this study to help design educational programs and materials that will benefit farmers in coping with environmental issues.
2. Public sector agencies (i.e. DER and EPA), Extension educators and communicators should collaborate to identify effective delivery methods that could be useful to help farmers cope with environmental issues.
3. Educators and communicators should consider the demographic characteristics of their audience before planning educational programs on environmental issues.
4. Extension educators, communicators, scientists, and public organizations should educate the farmers to integrate sound environmental practices and agricultural production enterprises.

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