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The results of this research show that Iowa beginning farmers prefer radio and information services for the delivery of beginning farmer education. At the same time, these same farmers viewed the Extension Service as an important educational provider. Research was conducted to identify the perceptions of beginning farmers toward education, educational providers, and educational media. A sample of beginning farmers was surveyed in 1997. This study revealed they prefer on-site educational instruction, single meetings, community-based education, and were "neutral" (had no opinion) about the future usefulness of cutting-edge technologies as a delivery method. The results of this study should be useful to educational providers who plan and deliver education to beginning farmers.

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The results of this research show that Iowa beginning farmers prefer radio and information services for the delivery of beginning farmer education. At the same time, these same farmers viewed the Extension Service as an important educational provider. Research was conducted to identify the perceptions of beginning farmers toward education, educational providers, and educational media. A sample of beginning farmers was surveyed in 1997. This study revealed they prefer on-site educational instruction, single meetings, community-based education, and were “neutral” (had no opinion) about the future usefulness of cutting-edge technologies as a delivery method. The results of this study should be useful to educational providers who plan and deliver education to beginning farmers.

The knowledge explosion, the information and computer age, rapidly changing agricultural technology, structural changes in agriculture, and the complexity in farm decision-making have all impacted

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how farmers receive and use educational information. A myriad of educational information delivered with an extremely wide variety of sources is available to farmers and they, in turn, are prioritizing how they obtain, analyze, and use educational information.

Research and census data indicate that the agricultural farming industry of the twenty-first century will likely be composed of commercial farms producing 95% of the total agricultural output and part-time farmers contributing a much smaller portion of the total output. Educational programs and the delivery of these programs must be planned to provide instruction to both groups. Because these groups are different, different program goals must be established (Robinson, 1983).

At the same time, it has been well documented that beginning farmers (defined as entrants into agriculture) will be needed to replace retiring farmers and those exiting farming. For example, Lasley (1985) states that 16,000 new Iowa farmers will be needed to replace those leaving between 1992 and 2002.

Chizari and Taylor (1991) found that few states have conducted research to identify educational needs of adults in production agriculture. Hillyard (1979) said educators must do a better job of identifying the agricultural education needs of beginning farmers. With emphasis on lifelong learning, Zemsky and Meyerson (1985) state that adjustments must be made in educational programs for adults involved in agriculture. According to Martin (1990), lifelong learning, as it relates to agriculture, can not be denied.

Regarding the delivery of education, Cano and Miller (1987) found some interesting characteristics about adult education in agriculture. Farmers perceived the Cooperative Extension Service as a provider of their education. They also found that agribusiness owners and managers perceived product-line companies as a major source of education. Martin and Omer (1990) researched the methods of delivering agriculturally related educational programs to adults as perceived by extension personnel and postsecondary agriculture instructors. They found that postsecondary agriculture instructors tended to have a high level of regard for the principles of teaching and learning and placed a high priority on using a variety of teaching methods. Extension personnel considered radio to be very important and that presentation style and competence of instructors needed to

be enhanced. Martin (1987) recommended that agriculture educators, at all levels, should learn to become facilitators of the educational process by planning and conducting educational programs with farmers and not merely for farmers.

All of these factors point to a strong need for continuing education for beginning farmers. The delivery of that education will be increasingly important in the future. Well planned programs focusing on the educational needs of beginning farmers will be necessary.

Purpose and Objectives

The primary purpose of this research was to identify the perceptions of beginning Iowa farmers toward beginning farmer education and the delivery of that education. Beginning farmers are defined to be new entrants into production agriculture and in the early stages of their farming careers. A secondary purpose was to determine the extent to which selected educational providers and media were useful to beginning farmers. Objectives of the research included the identification of beginning farmers' perceptions regarding delivery systems and the adequacy of the content of beginning farmer educational programs as well as the extent to which selected educational providers of education and educational media are important to beginning farmers.

Methods and Procedures

This study is part of a long-term research project focusing on beginning farmer education in Iowa. Data were collected by a self-administered, mail questionnaire sent to a randomly selected list of beginning farmers who had received a beginning farmer loan from the Iowa Agricultural Development Authority (IADA) between 1992 and 1996. The sample size was 286 farmers.

The IADA exists to develop and implement programs that assist Iowa farmers to finance the purchase of agricultural land, depreciable machinery or equipment, breeding livestock, and buildings. Loan applicants must be at least 18 years old, can not own more than 30% of the county's median farm size, and have a net worth of no more than \$200,000.

The survey instrument was developed by the researchers and pilot tested by a panel of experts. In addition to demographic informa-

tion about the respondents, the survey contained sections dealing with the current and future usefulness of educational providers and educational media, perceptions related to the delivery of beginning farmer education, and perceptions related to selected program topics. Farmers indicated their level of agreement ranging from 1 (strongly disagree) to 5 (strongly agree); a Likert-type scale rating. Likert-type scale ratings seem to be the most useful in behavioral research, according to Issac and Michael (1990). They are easier to develop and yield about the same information as equal-appearing interval scales. Also, a greater variance is obtained. Questionnaires were received from 138 participants — a 48% response rate. Of the 138 returned questionnaires, 128 were considered to be useable (92.7%). No statistical differences were found between respondents and nonrespondents after telephoning a random sample of ten percent of the nonrespondents. The research study also had some limitations that could impact upon the findings. Since the study was limited to those beginning farmers who had received a loan from the IADA, the results may not be generalizable to all beginning farmers. Also, low response rates were expected due to the fact that farmers do not respond well to surveys (Lasley, 1985; Howe, 1977). However, the actual response rate for this study was similar to other studies.

Major Findings

Demographic Characteristics. Demographic characteristics for the respondents indicated that all farm operators were male, with an average age of 33.9 years, and 14.02 years of formal education (high school plus 2 years of college). Additionally, 97% were raised on a farm, and over 90% of the respondents' parents were farmers. More than 60% of the beginning farmers were farming with their parents, in-laws, or other relatives.

Crops, swine, and beef cattle were the predominant farming enterprises. Nearly 50% of the farmers were farming less than 320 acres; approximately one-fourth were farming more than 640 acres. Forty-two percent of the farmers reported gross sales of less than \$100,000 as contrasted to 32% with gross sales of more than \$200,000.

From the survey data, the farm operators averaged 50.7 hours per week working on the farm and 32.5 hours per week working off the farm. The predominant business arrangement for the farming

operation included owning some land and leasing some land and/or facilities from others (56%). Few farm operators reported owning all of their land (15%). Just over two-thirds of the beginning farmers reported having access to a computer. However, less than 30% reported having a fax machine, using electronic mail, or subscribing to an on-line service.

Educational Providers and Media. In Iowa, a variety of educational providers using a diverse set of media are used to deliver beginning farmer education. Respondents rated the future usefulness of selected educational providers and media as needed in their farming careers. Future usefulness was defined as, "I will use it or have the potential to use it." Educational providers were defined as those individuals or groups that provide education to beginning farmers. Educational media were defined to be instructional technology or delivery method used by the provider. The means and standard deviation regarding the future usefulness of selected education providers and media are found in Table 1.

Parents, siblings, and relatives were rated the highest as a future educational provider (4.11). Since more than 60% of the respondents were farming with their parents, it is not surprising that they were viewed as a major educational provider. The Extension Service was rated high as an educational provider (3.71). The beginning farmers placed a strong importance on Extension as an unbiased source of information. Closely clustered together were agricultural consultants, farm organizations, agribusiness and commercial farms, and commodity organizations. Their means ranged from 3.50 to 3.57. The beginning farmers were "neutral" (had no opinion) regarding high school agricultural programs and university credit and noncredit courses.

Radio (3.83) and informational services (3.80) rated the highest in terms of their future usefulness as educational media. These instructional technologies have the potential to provide timely and up-to-date information. Marketing services (3.68) and newspapers (3.63) were rated nearly the same. Newsletters from marketing services and newspapers represent the highest rated print media. Television (3.45) and Extension Service pamphlets (3.44) were clustered together and were rated only slightly useful. Cutting-edge instructional technologies such as the Internet (3.23), satellite dishes (3.39), and fiber optics network (3.08) were rated much lower than some of the

Table 1 Means and Standard Deviations Regarding the Future Usefulness of Educational Providers and Educational Media

	M	SD
Educational Provider:		
Parents, siblings, and relatives	4.11	0.97
Extension	3.71	1.01
Agricultural consultants	3.57	1.04
Farm organizations	3.56	0.91
Agribusiness and commercial farms	3.50	1.07
Commodity organizations	3.43	1.04
Government agencies (FSA, NRCS)	3.39	1.15
Community colleges	3.37	1.16
High school agricultural programs	3.10	1.27
Iowa State credit courses	3.08	1.10
Iowa State non-credit courses	3.05	0.99
Educational Media:		
Radio	3.83	0.89
Informational services (Farm Dayta)	3.80	1.02
Marketing services	3.68	0.97
Newspaper	3.63	0.99
Television	3.45	1.12
Extension service pamphlets	3.44	1.08
Satellite dish	3.39	0.99
Internet-World Wide Web (WWW)	3.23	1.19
Video Tapes	3.17	1.09
Home study packets	3.14	1.01
Farm packets	3.13	0.99
Fiber optics network (ICN)	3.08	0.99
Audio Tapes	2.80	1.09
Note. Response scale: 1 =not useful; 2=limited usefulness; 3=no opinion; 4=useful; 5=extremely useful		

more traditional instructional technologies. This may suggest the lack of familiarity of the respondents regarding the potential of these technologies as delivery methods for education. Audio tapes (2.80) were less likely to be used in the future by beginning farmers.

Delivery Methods. The beginning farmers were asked to respond to eleven statements regarding the delivery of beginning farmer

Table 2 *Means and Standard Deviations Regarding the Perceptions of Beginning Farmers Towards the Delivery of Beginning Farmer Education in Iowa*

M	SD
I am never too old to learn	4.59 0.57
Farming is more complex today requiring more time to up-to-date	4.27 keep 0.73
Beginning farmers need to consult a variety of information sources to make competent farming decisions	4.17 0.78
On-site educational instruction (face-to-face) is my preferred method of receiving beginning farmer education	3.65 0.92
Single meetings on specific topics should be emphasized	3.62 0.77
Beginning farmers should consult with public institutions (schools, colleges, and universities) for unbiased agricultural information	3.61 0.92
Series of meetings or workshops with in-depth analysis of a topic should be emphasized	3.38 0.89
To keep up-to-date, beginning farmers should participate in educational programs on a year-around basis	3.33 0.98
I am willing to pay tuition and fees to attend beginning farmer education classes	3.09 1.04
I would prefer to attend beginning farmer educational meetings taught by fiber optic, satellite, or a similar statewide communication system	2.85 0.96
I am willing to travel up to one hour to attend beginning farmer education classes	2.74 1.00

Note. Response scale: 1=strongly disagree; 2=disagree; 3=no opinion; 4=agree; 5=strongly disagree.

education (Table 2). The beginning farmers expressed a strong need for continuing education and lifelong learning (4.59). This need rated the highest among the eleven statements. Regarding the delivery of beginning farmer education, respondents felt that more time is required to keep up-to-date (4.27), and a variety of information sources should be consulted (4.17). The beginning farmers expressed a desire for on-site educational instruction (3.65) and single meetings on specific topics (3.62). Of lesser importance to beginning farmers were year-around programs (3.33) and a series of meetings/workshops with an in-depth analysis (3.33). The beginning

farmers were neutral regarding tuition and fees (3.09). At the same time, they expressed little interest in attending beginning farmer educational meetings taught by fiber optics, satellite, or similar communication systems (2.85). Travel distance is important to respondents, and the beginning farmers were not willing to travel up to one hour to attend educational classes (2.74).

Statistical tests were also used to analyze the data and find significant differences. Significant differences were found in the delivery methods when the data were grouped by the level of education. Those respondents who had completed some college tended to agree more with the statements regarding delivery. Likewise, significant differences were found when respondents were grouped by the number of hours worked on the farm. Those who worked more hours tended to agree more with the statements concerning beginning farmer education.

Summary, Conclusions, Recommendations

According to the results and findings of this study, several conclusions and recommendations can be made:

1. The beginning farmers recognize the need for continuing education. Educators are, therefore, challenged to develop programs that fit the needs of beginning farmers in terms of content and delivery.
2. Parents, siblings, and relatives are considered by beginning farmers as a major educational provider. Therefore, delivery methods involving both groups should be considered. Joint educational programming should be emphasized.
3. Beginning farmers rated Extension very high as an educational provider. Therefore, Extension has an opportunity to expand its educational services to beginning farmers.
4. Information services and marketing services rated moderately high as an educational provider. Delivery models that incorporate these groups could have a high payoff for other groups, including Extension, involved in the delivery of beginning farmer education.
5. University credit and non-credit courses rated lower as a means of providing education. Additional research is needed to determine the effectiveness of these courses and improve their competitiveness as a means of educational delivery.

6. Radio and information services were the preferred educational media for delivery of beginning farmer education. By establishing a strong relationship with these media, Extension and other educational providers can improve the delivery of up-to-date information on a timely basis.
7. While agricultural consultants, farm organizations, agricultural business and commercial firms, and commodity organizations rated lower as educational providers, they are, nevertheless, important as educational providers. Jointly sponsored educational programming and Extension can be an effective delivery model and expands opportunities available to beginning farmers. It also helps meet the needs of beginning farmers to consult a variety of sources for information.
8. Beginning farmers prefer on-site educational instruction with single meetings on specific topics. At the same time, educational providers should develop these programs that include a variety of instructional methods emphasizing problem-solving experiential learning, and hands-on experiences.
9. Due to beginning farmers expressing a “neutral” opinion about the future usefulness of cutting-edge technologies as a delivery method, educators should develop programs and information that explain the use of the Internet, World Wide Web (WWW), on-line computer services, and other instructional technologies.
10. More research is needed on teaching at a distance since beginning farmers were “neutral” (had no opinion) regarding this form of instructional technology. This could be due to the fact that beginning farmers do not understand distance education.

The results of this study can provide the basis for educational providers to improve upon the delivery of beginning farmer education. Respondents in the study clearly recognize the need for life-long learning. Educational providers need to recognize this demand and develop educational programs using appropriate delivery models that satisfy this demand.

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