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Examining Information Search Strategies of Ohio Farmers

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Abstract: As information becomes more ubiquitous than ever before, understanding the what, how, and why of farmers' information search strategies becomes more important to Extension professionals. Based on a mail survey of farmers in Ohio, the study reported here examined farmers' informational needs and identified factors that influence farmers' information choices. Specifically, the results highlight the differences in farmers' search strategies regarding type, amount, and sources of information. Findings show farmers practiced high-, moderate-, and low-search strategies to stay current on topics important to their farm business. The implications for Extension professionals are discussed.

Introduction

Information has increased dramatically in value over the past decades and has become vital to the financial success of farmers. At the same time, farmers have more choices than ever before to gather information from both public and private sector providers. As competition in the information marketplace increases, the understanding of farmers' informational needs has become particularly critical for Extension (Boehlje & King, 1998; King & Boehlje, 2000; Escalante, Florkowski, Landry, & Boumtje, 2004).

The literature suggests that a number of demographic, socio-economic, and business-related factors determine farmers' information search (see, for example, Ford & Babb, 1989; Jones, Batte, & Schnitkey, 1989; Lichtenberg & Zimmerman, 1999; Ortmann, Patrick, Musser, & Doster, 1993; Patrick & Ullerich, 1996; Schnitkey, Batte, Jones, & Botomogno, 1992). The factors, however, provide only limited insight into farmers' strategies for information search activities. Understanding differences in the number and type of information sources and the frequency of their usage is of vital importance to information providers because this knowledge is critical in developing appropriate educational and informational strategies to respond to different search strategies (Gloy & Akridge, 1999; Rosenberg & Turvey, 1991; Ziehl, Thilmany, & Umberger, 2005). The research reported here contributes to the understanding of the scope and determinants

of farmers' information use and needs by focusing on the following objectives:

1. To determine current topics of interest to farmers;
2. To identify and categorize the search strategies employed by farmers based on their preferred sources of information; and
3. To identify factors that influences the search strategies of farmers.

Data

The data was collected as part of a larger effort to assess the demand for information and educational programming of key clientele groups of Ohio State University Extension. Findings reported here are based on original data of farmers operating farms of all types and sizes across Ohio. The study employed a mailed survey conducted in early spring 2007. A total of 3,000 questionnaires were mailed to randomly selected farmers following best survey practices (Dillman, 2006). A total of four contacts were made with each sampled farmer. Contacts consisted of an announcement letter, a survey package (including a cover letter, a questionnaire, and a prepaid return envelope), a thank-you/reminder postcard, and a replacement survey package.

The survey instrument was developed with input from academics, Extension professionals, and the agribusiness and marketing literature. An initial instrument was developed and piloted with a small group of farmers to test face validity and establish reliability. The survey instrument consisted of several sections: demographic and socio-economic information; farmers' demand for agricultural information, including topics related to farm production; farm economics, environment/conservation, and family issues surrounding a farm business; and farmers' information usage based on the frequency of use of typical information sources, including print, broadcast, electronic media, and interpersonal sources.

The sample list was purchased from a private vendor and weighted to match the distribution of farm size (as measured by farm gross sales) with the population estimate of the 2002 Census of Agriculture for Ohio (NASS, 2002). We oversampled farms with gross sales exceeding \$250,000 to achieve a meaningful number of these farms on which to base estimates for this group. A weighting procedure was applied in the calculation of all statistics to return the numbers to a sample representative for the population of farmers in the state.

A total of 1,715 surveys were returned. A total of 115 respondents refused to answer, 260 were no longer farming or were deceased, and 24 addresses were invalid. A total of 116 surveys were excluded from the data analysis due to incomplete answers. The number of usable surveys for data analysis totaled 1,224, resulting in a 41.4 % response rate of eligible surveys. To check for non-response bias, data about place of residence (county) and estimates of the farms' gross sales were used that was available for both respondents and non-respondents. Chi-squared tests were used to evaluate variation in response rate between Ohio Agricultural Statistics Districts (ODA, 2006) and between different farm sales classes. No significant variation was found in either of these tests, suggesting the absence of non-response bias across these categories.

Sample Description

The demographic and socio-economic characteristics of respondents are summarized in Table 1. The survey yielded responses that resulted in a mean farm size of 196 acres. The majority of farms (60.0%) were found to have total annual farm sales of less than \$10,000; 21.8% of farms had sales between \$10,000 and \$49,999; 13.7% had sales between \$50,000 and \$250,000; while 4.5% of respondents reported farm sales exceeding \$250,000. The majority of farms (56.1%) were producing grain or oilseed crops, and 45.0% raised livestock.

The proportion of farmers working off-farm during most time of the year was 64.1%. Internet access was reported by 60.6%. On average, farmers were 56.5 years old and were farming for 27.2 years. A college degree was reported by 21.7% of respondents; 88.3% were male, 94.5% were white, and 79.9% were married. Compared to the most recent available Census of Agriculture for Ohio (NASS, 2002), respondents exhibited similar characteristics in farm size distribution (acreage and farm sales classes) and proportion of respondents working off-farm. The sample exhibited a slightly higher mean age and a higher proportion of female farmers. The sample also contained a higher proportion of grain and oilseed producers and livestock farmers than the 2002 average. Access to the Internet was slightly higher in the sample compared to the most recent available NASS data for the state (NASS, 2007).

Many of the respondents' demographic and economic characteristics differed by farm size (Table 1). Household income varied significantly ($p < .000$) across farm size categories, ranging from \$42,965 for farms with sales less than \$10,000 to \$71,622 for the second highest sales group (farms with sales between \$50,000 and \$249,000). A high proportion (71.4%) of farms with sales less than \$10,000 had operators with full or part-time off-farm employment. This percentage decreased with increasing farm size ($p < .000$), dropping to 20.7% for farms with sales exceeding \$250,000. Farmers' professional experience, as measured in years farming, varied significantly ($p < .000$) by farm size and was lowest for farms with sales less than \$10,000 (27.2 yrs.) and highest for farms with sales between \$50,000 and \$249,000 (34.7 yrs.). Finally, the proportion of farmers with access to the Internet also increased with farm size ($p < .050$), ranging from 57.9% for farms with sales less than \$10,000 to 78.3% for farms with sales exceeding \$250,000.

Table 1.
Demographic and Socio-economic Characteristics, by Size of Farm (Farm Gross Sales)

| Variable | Range | Farm Gross Sales | | | | | Sig ^a |
|-----------------------------------|-------|-------------------|--------------------|---------------------|----------------------|--------------------|------------------|
| | | All | Less Than \$10,000 | \$10,000 - \$49,999 | \$50,000 - \$249,999 | \$250,000 and over | |
| | | Mean (SD) | | | | | |
| Demographic Characteristic | | | | | | | |
| Age | 21-93 | 56.50 (12.864) | 55.54 (13.661) | 56.87 (11.845) | 56.17 (11.744) | 55.20 (9.700) | n.s. |
| Education (B.Sc. and higher=1) | 0-1 | 0.217 (0.4126) | 0.227 (0.4189) | 0.204 (0.4035) | 0.196 (0.3978) | 0.226 (0.4224) | n.s. |
| Marital status (married=1) | 0-1 | 0.799 (0.4008) | 0.792 (0.4065) | 0.793 (0.4056) | 0.815 (0.3892) | 0.879 (0.3292) | n.s. |

| | | | | | | | |
|--|--------|------------------------|------------------------|------------------------|------------------------|------------------------|-----|
| Gender (male=1) | 0-1 | 0.883 (0.3210) | 0.835 (0.3710) | 0.944 (0.2306) | 0.969 (0.1739) | 0.970 (0.1712) | *** |
| Race (white=1) | 0-1 | 0.945 (0.1833) | 0.986 (0.1181) | 0.932 (0.2520) | 0.935 (0.2480) | 0.944 (0.2320) | *** |
| Household income | | \$63,359 (\$25,813) | \$42,965 (\$18,213) | \$48,538 (\$17,242) | \$71,622 (\$24,491) | \$61,520 (\$26,472) | *** |
| Socio-Economic Characteristic | | | | | | | |
| Total acreage (acres) | 1-6500 | 196.08 (391.811) | 79.16 (161.766) | 142.60 (176.633) | 445.26 (378.556) | 1258.48 (993.376) | *** |
| Livestock (livestock=1) | 0-1 | 0.450 (0.4977) | 0.422 (0.4942) | 0.533 (0.4998) | 0.422 (0.4953) | 0.504 (0.5046) | * |
| Percent sales from livestock | 0-1 | 0.583 (0.3809) | 0.579 (0.3947) | 0.645 (0.3512) | 0.478 (0.3623) | 0.587 (0.3717) | * |
| Grain/oilseed (=1) | 0-1 | 0.561 (0.4964) | 0.382 (0.4863) | 0.744 (0.4371) | 0.917 (0.2763) | 0.974 (0.1618) | *** |
| Off-farm work (=1) | 0-1 | 0.641 (0.4798) | 0.714 (0.4521) | 0.631 (0.4835) | 0.480 (0.5011) | 0.207 (0.4092) | *** |
| Years in farming | 1-80 | 27.17 (14.035) | 23.42 (17.803) | 31.25 (14.614) | 34.68 (12.995) | 34.36 (11.621) | *** |
| Internet access (Internet=1) | 0-1 | 0.606 (0.4888) | 0.579 (0.4941) | 0.622 (0.4858) | 0.643 (0.4805) | 0.783 (0.4162) | * |
| N | | 1224 | 734 | 267 | 168 | 55 | |
| ^a Significance of the multivariate F-test. The symbols (*), (**), (***) denote coefficients that are statistically different from zero at the 10%, 5%, and 1% levels. | | | | | | | |

Farmers' Information Needs

To assess farmers' information needs, respondents were asked to rate the level of importance of 34 farming topics on a seven-point scale ranging from not important (=1) to very important (=7). Factor analysis was used to uncover the underlying themes using the principal components method and Varimax rotation (Hutcheson & Sofroniou, 1999). Item loadings under each factor were then examined for reliability using Cronbach's alpha. Unsatisfactory items were removed, and the factor analysis then repeated with the remaining items. The factors that emerged reflect five informational themes and are composed of the items presented in Table 2.

Table 2.
Topical Factors Derived From Factor Analysis

| Measures (Cronbach's alpha scale reliability, factor loadings) |
|--|
| <i>Crops</i> (=.809) Soil tillage (.785), pesticide application practices, regulation, and safety (.756), crop production (.686), water management (.588), soil fertility management (.553) |
| <i>Livestock</i> (=.919) Animal health and nutrition (.935), livestock production (.885), manure management (.874) |
| <i>Farm economics</i> (=.920) Economic outlook and policy (.801), farm cost and return estimates (.773), farm business planning (.743), farm bill (.757), marketing (.706), risk management (.704), farm succession (.656), small farms (.534) |
| <i>Environment and Conservation</i> (=.856) Natural resources management (.830), conservation practices (.766), water quality (.707), land use policy (.546), organic farming (.545) |
| <i>Family</i> (=.888) Adult development (.881), family life (.878), leadership and life skills (.841), child care, parenting (0.735), family financial management (.580), food and nutrition (.562) |
| Note: N=1224. All items measured on a seven-point scale. Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization; Rotation converged in 7 iterations; Total variance explained: 67.4%. |

Table 3 shows the mean factor scores for information topics by farm size. Results show that, overall, farmers reported the highest demand for information related to environment and conservation topics, followed by farm economics information and crop information. Livestock information ranked lowest overall, except for livestock farmers, who ranked this topic as most important. Farmers reported higher demand for crops and farm economics information as their farm size increased ($p < .050$). We found little variation in importance for environmental information and family information across farm sizes.

Table 3.

Mean Factor Scores for Information Topics, by Size of Farm (Farm Gross Sales)

| Factor | Farm Gross Sales | | | | | Sig ^a |
|----------------|------------------|--------------------|---------------------|----------------------|--------------------|------------------|
| | All | Less Than \$10,000 | \$10,000 - \$49,999 | \$50,000 - \$249,000 | \$250,000 and over | |
| | Mean (SD) | | | | | |
| Crops | 4.54 (1.333) | 4.20 (1.402) | 4.87 (1.080) | 5.22 (0.991) | 5.36 (0.792) | ** |
| Livestock | 4.11 (2.104) | 4.22 (2.019) | 4.16 (2.181) | 3.54 (2.210) | 4.10 (2.285) | ** |
| Farm economics | 4.77 (1.402) | 4.41 (1.476) | 5.18 (1.158) | 5.41 (1.015) | 5.54 (0.799) | ** |

| | | | | | | |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|------|
| Environnement and Conservation | 5.22 (1.263) | 5.19 (1.299) | 5.21 (1.268) | 5.35 (1.149) | 5.36 (1.063) | n.s. |
| Family | 4.47 (1.447) | 4.39 (1.455) | 4.53 (1.429) | 4.66 (1.436) | 4.57 (1.432) | n.s. |
| N | 1224 | 734 | 267 | 168 | 55 | |
| ^a Significance of the multivariate F-test. The symbol (**) denotes coefficients that are statistically different from zero at the 5% level. | | | | | | |

Sources of Information for Farmers

Today's farmers have access to a wide array of potential information sources ranging from informal to highly formalized sources, and from traditional offline to online delivery methods (Ford & Babb, 1989; Schnitkey et al., 1992; Suvedi, Campo, & Lapinski, 1999; Suvedi, Lapinski, & Campo, 2000). We expected farmers to display differing levels of demands for the different information sources and delivery methods based on their demographic, socio-economic, and attitudinal characteristics. The questionnaire included the following 25 information sources:

- Eight print-based sources (general farm magazines, specialized farm magazines, agricultural newspapers, daily/weekly newspapers, publications from commercial firms, Extension publications, books, and newsletter/reports from farm organizations);
- Two broadcast media sources (television and radio);
- Five electronic sources (video/CD/DVD programming, Internet/Web sites, electronic newsletters, computer software, and subscriptions to professional services); and
- Ten interpersonal sources (family members, friends and neighbors, other farmers, private consultants, private companies, Extension personnel, U.S. Department of Agriculture (USDA) Service Center Agency personnel, Soil and Water District (SWD) personnel, trade fairs & exhibitions, and farmers' organizations).

We found that farmers preferred print media over interpersonal sources and broadcast media (Table 4). In comparison, farmers reported to be significantly less likely to use electronic media compared to traditional media. However, it is noteworthy that the importance of electronic media increased with farm size ($p < .050$). We observed a similar but less steep increases for the relationships of farm size and print media ($p < .050$) as well as farm size and interpersonal sources ($p < .050$).

Table 4.
Mean Factor Scores for Information Sources, by Size of Farm (Farm Gross Sales)

| | | |
|---------------|-------------------------|------------------------|
| | Farm Gross Sales | |
| Factor | | Sig^a |

| | All | Less Than \$10,000 | \$10,000 - \$49,999 | \$50,000 - \$249,000 | \$250,000 and over | |
|--|-----------------|-----------------------|------------------------|-------------------------|-----------------------|----|
| Mean (SD) | | | | | | |
| Print media | 4.07 (1.193) | 3.85 (1.190) | 4.32 (1.164) | 4.49 (1.076) | 4.60 (0.993) | ** |
| Broadcast media | 3.84 (1.633) | 3.71 (1.646) | 4.07 (1.603) | 4.03 (1.588) | 3.90 (1.601) | ** |
| Electronic media | 2.54 (1.412) | 2.31 (1.319) | 2.65 (1.434) | 2.96 (1.458) | 3.70 (1.455) | ** |
| Interpersonal sources | 3.86 (1.207) | 3.63 (1.227) | 4.07 (1.138) | 4.33 (0.010) | 4.58 (0.950) | ** |
| N | 1224 | 734 | 267 | 168 | 55 | |
| ^a Significance of the multivariate F test. The symbol (**) denotes coefficients that are statistically different from zero at the 5% level. | | | | | | |

Farmers' Information Search Strategies

To further investigate the search strategies employed by farmers, we conducted cluster analysis to identify homogeneous subgroups of farmers with similar information search patterns (Gloy & Akridge, 1999; Ziehl et al., 2005). Cluster analysis seeks to identify a set of groups that both minimize within-group variation and maximize between-group variation. This type of analysis has been utilized before to target appropriate information delivery methods to subgroups of farm clientele (Gloy & Akridge, 1999; Rosenberg & Turvey, 1991).

To identify the subgroups we used the 25 information sources and employed k-means clustering technique following a procedure described in Schneider and Roberts (2004). To employ this algorithm the desired number of clusters, K, is specified in advance and initial cluster centers chosen randomly in a first pass of the data. Each additional iteration group observation is based on nearest Euclidean distance to the mean of the cluster. Based on the distances between mean frequencies of information source usage, we identified the four clusters presented in Table 5.

Table 5.
Description of Information Search Clusters

| Cluster | Name | Description | N (% of sample) |
|---------|---------------------|---|-----------------|
| 1 | Low-search strategy | A low-search group practicing a low-information strategy. The cluster's mean information gathering score was 2.60 (SD: 0.577), the lowest of the four clusters. | 397 (32.4%) |
| 2 | | | |

| | | | |
|---|-----------------------------------|---|----------------|
| | Moderate, offline-search strategy | A moderate-search group practicing a multi-source, moderate information strategy. These respondents exhibit a low usage of electronic information sources. The cluster's mean information gathering score was 3.84 (SD: 0.538). | 344 (28.2%) |
| 3 | Moderate, online-strategy | A moderate-search group practicing a multi-source, moderate information strategy. These respondents exhibit a high usage of electronic information sources. The mean information gathering score was 3.98 (SD: 0.490). | 253 (20.7%) |
| 4 | High-search strategy | A high-search group practicing a multi-source, high-information strategy. These respondents were highly information driven and use a diversified information strategy. The cluster's mean information gathering score was 5.15 (SD: 0.469). | 230 (18.8%) |

Profiling Farmers' Information Search Strategies

Examining the four search strategies in more detail (Table 6), we found that farmers practicing a high-search strategy (Cluster 4) were close to the mean age of the sample, less likely to have completed a college education, but operated the largest farms in terms of both sales volume and acreage. This high-search group was also more likely than the average survey respondent to be raising livestock, to seek off-farm employment, and to have Internet access.

Farmers in the high-search group reported the highest demand for information across all five topical areas. Moreover, we found farmers in the high-search group to be the most frequent users of Extension publications and general farm magazines, followed by daily/weekly newspapers, agricultural newspapers, and newsletters/reports from farm organizations. Publications from commercial firms and books were less often used by farmers in the high-search group. The lowest use was reported for specialized farm magazines. Farmers in the high-search group were also most likely to use broadcast media and the Internet to gather information. In addition, these farmers were likely to make use of subscriptions to professional services, electronic newsletters, software, and video/CD/DVD programming. Finally, we found that the high-search group of farmers reported to be the most frequent users of USDA personnel, other farmers, OSU Extension personnel, and friends and neighbors when gathering information.

Examining the two moderate-search strategies, we found that farmers using online media (Cluster 3) tended to be the younger, more highly educated group that operated larger farms, but were less likely to raise livestock compared to farmers using predominantly traditional, offline media (Cluster 2). As expected, the moderate online-search farmers were more likely having Internet access compared to the moderate offline-search farmers. Farmers in Cluster 3 were also more likely to work off the farm, at least part of the year.

Farmers practicing the online-search strategy reported a low use of print-based media that was similar to farmers in the low-search cluster. Farmers in Cluster 3 ranked second in use of broadcast media and were

most likely to use electronic newsletters, software, and video/CD/DVD programming. Examining the usage of interpersonal sources, we found other farmers, friends and neighbors, USDA and SWD personnel most relevant to farmers in Cluster 3.

On the other hand, farmers practicing the traditional, offline-search strategy (Cluster 2) reported to most frequent use daily/weekly newspapers, Extension publications, and general farm magazines, and, to a slightly lesser extent, newsletters/reports from farm organizations, publications from commercial firms, books, and specialized farm magazines. Compared to Cluster 3, farmers in Cluster 2 were less likely to listen to broadcast media but their use of interpersonal sources showed a comparable pattern—with USDA and SWD personnel ranked as most important informational sources ahead of other farmers, friends, and neighbors. With respect to farmers' topical interests, we found that both moderate-search strategies expressed a similar demand for environment, conservation, and family information. The offline-search group (Cluster 2), however, reported a higher demand for crop, livestock, and farm economics information than farmers using online sources (Cluster 3).

Farmers practicing the low-search strategy (Cluster 1) tended to be younger and to hold a college degree. Low-search farmers were the most likely to seek off-farm employment, to report the smallest average farm size measured in both acreage and gross sales, and to be least likely to own livestock. Farmers in the low-search group reported a usage pattern of print-based media similar to the two moderate-search strategies, albeit with a lower frequency. They were least likely to use broadcasts media compared to the other clusters. The low-search farmers also scored lowest in using interpersonal sources. If they did, they preferred other farmers, friends and neighbors, family members, and SWD personnel. Demand for information across all topical categories was lowest for this group of farmers.

Table 6.
Comparison of Information Search Strategies

| Variable | All | Low-Search (Cluster 1) | Moderate, Offline-Search (Cluster 2) | Moderate, Online-Search (Cluster 3) | High-Search (Cluster 4) | Sig ^a |
|---|------------------------|---------------------------|--|---|----------------------------|------------------|
| | Mean (SD) | | | | | |
| Demographic and Socio-economic Characteristics | | | | | | |
| Age | 56.5 (12.84) | 54.8 (14.03) | 60.1 (13.73) | 54.6 (10.22) | 56.2 (10.83) | *** |
| Education (B.Sc. and higher=1) | 0.217 (0.413) | 0.249 (0.433) | 0.173 (0.379) | 0.272 (0.446) | 0.169 (0.376) | ** |
| Marital status (married=1) | 0.799 (0.401) | 0.778 (0.416) | 0.764 (0.425) | 0.834 (0.373) | 0.850 (0.358) | * |
| Household income | \$63,359 (\$25,813) | \$50,600 (\$20,111) | \$50,375 (\$20,605) | \$72,349 (\$25,211) | \$63,274 (\$23,356) | *** |
| Off-farm work (=1) | 0.641 (0.4798) | 0.724 (0.4475) | 0.562 (0.5001) | 0.654 (0.4767) | 0.658 (0.4753) | *** |
| Years in farming | | | 32.22 (17.198) | 27.66 (14.049) | | *** |

| | | | | | | |
|---|------------------------|------------------------|------------------------|------------------------|-------------------------|-----|
| | 27.17 (16.959) | 21.05 (17.551) | | | 29.57 (15.279) | |
| Total acreage (acres) | 196 (391.8) | 125 (283.8) | 166 (274.6) | 246 (468.0) | 308 (549.4) | *** |
| Livestock (livestock=1) | 0.450 (0.4977) | 0.313 (0.4641) | 0.533 (0.4996) | 0.468 (0.5000) | 0.541 (0.4994) | *** |
| Farm gross sales | 77,094 (\$36,313.9) | 52,809 (\$26,570.0) | 67,829 (\$31,409.9) | 96,363 (\$37,033.9) | 100,364 (\$41,960.1) | *** |
| Internet access (Internet=1) | 0.606 (0.4888) | 0.610 (0.4884) | 0.345 (0.761) | 0.836 (0.3713) | 0.741 (0.4389) | *** |
| Information Sources | | | | | | |
| General farm magazines | 4.34 (1.802) | 2.99 (1.541) | 4.80 (1.699) | 4.52 (1.436) | 5.76 (1.062) | *** |
| Specialized farm magazines | 3.14 (2.047) | 2.00 (1.607) | 2.94 (1.982) | 3.82 (1.845) | 4.66 (1.778) | *** |
| Agricultural newspapers | 4.08 (1.995) | 2.48 (1.702) | 4.73 (1.775) | 4.30 (1.479) | 5.60 (1.290) | *** |
| Daily/weekly newspapers | 4.89 (1.813) | 4.06 (1.901) | 5.37 (1.757) | 4.79 (1.682) | 5.69 (1.182) | *** |
| Publications from commercial firms | 3.72 (1.693) | 2.27 (1.360) | 4.12 (1.404) | 4.06 (1.205) | 5.26 (1.077) | *** |
| Extension publications | 4.45 (1.780) | 2.96 (1.636) | 5.19 (1.356) | 4.48 (1.371) | 5.86 (0.913) | *** |
| Books | 3.77 (1.747) | 2.91 (1.736) | 3.82 (1.731) | 3.90 (1.475) | 5.04 (1.137) | *** |
| Newsletters/reports from farm organizations | 4.19 (1.672) | 2.80 (1.496) | 4.75 (1.376) | 4.32 (1.218) | 5.61 (0.868) | *** |
| TV | 4.04 (1.773) | 3.11 (1.724) | 4.19 (1.694) | 4.29 (1.588) | 5.15 (1.324) | *** |
| Radio | 3.64 (1.861) | 2.74 (1.731) | 3.42 (1.860) | 4.07 (1.588) | 5.08 (1.262) | *** |
| Video/CD/DVD programming | 2.49 (1.557) | 1.62 (1.171) | 1.88 (1.162) | 3.09 (1.203) | 4.32 (1.277) | *** |
| Internet | 3.30 (2.061) | 2.53 (1.745) | 1.76 (1.183) | 5.01 (1.326) | 5.08 (1.543) | *** |
| Electronic newsletters | 2.42 (1.758) | 1.34 (0.802) | 1.36 (0.690) | 3.83 (1.546) | 4.31 (1.604) | *** |
| Computer software | 2.30 (1.629) | 1.37 (0.890) | 1.29 (0.578) | 3.42 (1.287) | 4.19 (1.573) | *** |
| Subscriptions to professional services | 2.17 (1.649) | 1.26 (0.698) | 1.51 (1.215) | 2.72 (1.489) | 4.12 (1.682) | *** |
| Family members | 3.97 (1.805) | 3.15 (1.791) | 3.69 (1.799) | 4.34 (1.338) | 5.42 (1.219) | *** |

| | | | | | | |
|--|--------------|--------------|--------------|--------------|--------------|-----|
| Friends and neighbors | 4.54 (1.568) | 3.92 (1.750) | 4.44 (1.501) | 4.65 (1.102) | 5.60 (1.146) | *** |
| Other farmers | 4.74 (1.505) | 3.98 (1.625) | 4.72 (1.461) | 5.02 (1.109) | 5.78 (0.900) | *** |
| Private consultants | 2.50 (1.751) | 1.38 (0.817) | 2.18 (1.635) | 3.09 (1.565) | 4.30 (1.596) | *** |
| Private companies | 3.29 (1.967) | 1.82 (1.324) | 3.32 (2.026) | 3.87 (1.525) | 5.11 (1.221) | *** |
| OSUE personnel | 3.89 (1.913) | 2.20 (1.422) | 4.39 (1.653) | 4.20 (1.401) | 5.71 (1.000) | *** |
| USDA personnel | 4.37 (1.898) | 2.85 (1.762) | 4.99 (1.607) | 4.53 (1.405) | 5.89 (0.943) | *** |
| SWD personnel | 4.31 (1.801) | 2.93 (1.564) | 4.81 (1.653) | 4.47 (1.394) | 5.43 (1.058) | *** |
| Trade fairs & exhibitions | 3.63 (1.895) | 2.17 (1.392) | 3.64 (1.882) | 4.20 (1.357) | 5.49 (0.982) | *** |
| Farmers' organizations | 3.41 (1.872) | 1.68 (1.012) | 3.93 (1.702) | 3.81 (1.408) | 5.15 (1.281) | *** |
| Information Topics | | | | | | |
| Crops | 5.54 (1.333) | 3.83 (1.435) | 4.54 (1.254) | 4.86 (0.939) | 5.41 (0.933) | *** |
| Livestock | 4.11 (2.104) | 3.67 (2.014) | 3.96 (2.117) | 4.23 (2.057) | 4.94 (2.046) | *** |
| Farm Business/Economics | 4.77 (1.402) | 3.95 (1.603) | 4.73 (1.240) | 5.15 (0.890) | 5.81 (0.690) | *** |
| Environment/Conservation | 5.22 (1.263) | 4.72 (1.390) | 5.34 (1.252) | 5.27 (1.061) | 5.88 (0.836) | *** |
| Home/Family | 4.67 (1.447) | 3.93 (1.597) | 4.50 (1.328) | 4.56 (1.283) | 5.24 (1.110) | *** |
| | | | | | | |
| N | 1224 (100%) | 397 (32.4%) | 344 (28.2%) | 253 (20.7%) | 230 (18.8%) | |
| ^a Significance of the multivariate F test. The symbols (*), (**), (***) denote coefficients that are statistically different from zero at the 10%, 5%, and 1% levels. | | | | | | |

Comparisons of the four information clusters by farm size (Table 7) showed that farms with sales less than \$10,000 predominantly practiced a low search strategy (42.5% of farmers in this sales group). About 27.8% of respondents in this group practiced a moderate, traditional search strategy that excluded the use of electronic media. Only 14.2% of farms with sales less than \$10,000 were found to practice a high-information strategy. On the other hand, farmers with sales exceeding \$250,000 predominantly practiced a high-information (41.8%) or moderate-information strategy including electronic sources (32.7%). Farms with sales between \$10,000 and \$250,000 could be placed primarily in the moderate search Clusters 2 and 3.

Table 7.
Comparison of Information Search Strategies, by Size of Farm

| Search strategy | All | Farms with Sales | | | |
|--|------------------|--------------------|---------------------|----------------------|--------------------|
| | | Less Than \$10,000 | \$10,000 - \$49,999 | \$50,000 - \$249,999 | \$250,000 and over |
| Low-search (Cluster 1) | 32.4% (N=397) | 42.5% (N=312) | 20.2% (N=54) | 14.9% (N=25) | 9.1% (N=5) |
| Moderate, offline-search (Cluster 2) | 28.2% (N=344) | 27.8% (N=204) | 31.5% (N=84) | 28.6% (N=48) | 16.4% (N=9) |
| Moderate, online-search (Cluster 3) | 20.7% (N=253) | 15.5% (N=114) | 25.8% (N=69) | 30.9% (N=52) | 32.7% (N=18) |
| High-search (Cluster 4) | 18.8% (N=230) | 14.2% (N=104) | 22.5% (N=60) | 25.6% (N=43) | 41.8% (N=23) |
| N | 1224 | 734 | 267 | 168 | 55 |
| Note: $\chi^2=119.597^{***}$; (***) denote coefficient that is statistically different from zero at the 1% level. | | | | | |

Conclusions

Farming continues to become more complex and information intensive. As a result, demands on farmers' decision-making in acquiring, evaluating, and processing information are increasing. Farmers have rapidly adopted emerging information and communication technologies over the last decade and have better access to information than ever before. Different types of information are likely to have different economic value to farmers. To be used, information must demonstrate that it is relevant and meaningful. This includes that information is packaged and delivered in a way most desired by users (Llewellyn, 2007). The study reported here showed that the acquisition of information packages can be associated with different search strategies. Recognizing the differences in farmers' search strategies can be an important aid for Extension professionals, private-sector consultants, marketers, and other information professionals because they effectively segment the farming population.

It should be noted as one important limitation that the study reported here was restricted to a representative sample of farmers in Ohio and may reflect conditions specific to this state. Still, the empirical evidence about differences in farmers' information strategies regarding type, amount, and source of information should have broad implications for both private sector and public information providers challenged to design the most effective strategies for disseminating farming information to client audiences.

Our analyses of the survey responses resulted in several key observations that are of particular relevance to Extension professionals. Results revealed that information regarding crops, livestock, farm economics, environment and conservation, and family were of high interest to farmers. Examining farming topics and farm size, we found that farmers' demand for crops and farm economics information increased with farm size. Demand for family topics was slightly lower for farms with sales of less than \$10,000 but steady for farms in higher sales categories. Livestock topics received the lowest ratings overall for farms with sales between \$50,000 and \$249,000 but received higher ratings by farmers with sales exceeding \$250,000. Results suggest that, overall, farmers prefer print media, interpersonal sources, and broadcast media to gather

information for their farm business and that electronic media were the least preferred information delivery method. Farm size was found to modify farmers' preferred information delivery method.

The study also suggested that farmers practiced four different high-, moderate-, and low-search strategies to stay current on topics important to their farm business. Comparisons of the four search strategies by farm size showed that farms with sales of less than \$10,000 predominantly practiced a low-search or a moderate-search strategy, and only a small proportion of these farmers was found to practice a high-search strategy. On the other hand, farmers with sales exceeding \$250,000 predominantly practiced a high-search or moderate-search strategy, including electronic media sources. Examining farming topics and search strategy, high-search farmers tended to focus their information search on crop-related information, closely followed by farm economics, environment, and conservation information. Respondents in the moderate and low-search groups were most likely to report highest information demand for environment and conservation information, closely followed by crops information. Farm economics received less attention; family and livestock information received the lowest attention.

Because the information available to farmers today is more ubiquitous and cluttered than ever before, it is increasingly important for agricultural information providers to deliver quality information in the proper format and at the right time to meet the needs of their clientele. A better knowledge and understanding of farmers' actual information search strategies will assist Extension professionals, agricultural consultants, and information specialists in designing the most effective method of disseminating information to the agricultural communities they serve.

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References

- Boehlje, M., & King, D. A. (1998). Extension on the brink—Meeting the private sector challenge in the information marketplace. *Journal of Applied Communications*, 82(3), 21-35.
- Dillman, D. A. (2006). *Mail and internet surveys: The Tailored Design Method*. Indianapolis, IN: Wiley.
- Escalante, C. L., Florkowski, W. J., Landry, G. W., & Boumtje, P. I. (2004). Alternative demand for university outreach services from Georgia's golf industry. *Review of Agricultural Economics*, 26(1), 118-131.
- Ford, S. A., & Babb, E. M. (1989). Farmer sources and uses of information. *Agribusiness*, 5(5), 465-476.
- Gloy, B. A., & Akridge, J. T. (1999). Segmenting the commercial producer marketplace for agricultural inputs. *International Food and Agribusiness Management Review*, 2(2), 145-163.
- Hutcheson, G., & Sofroniou, N. (1999). *The multivariate social scientist: Introductory statistics using generalized linear models*. Thousand Oaks, CA: Sage Publications.
- Jones, E., Batte, M. T., & Schnitkey, G. D. (1989). The impact of economic and socioeconomic factors on the demand for information: A case study of Ohio commercial farmers. *Agribusiness*, 5(6), 557-571.
- King, D. A., & Boehlje, M. D. (2000). Extension: On the brink of extinction or distinction? *Journal of Extension* [On-line], 38(5) Article 5COM1. Available at: <http://www.joe.org/joe/2000october/comm1.php>

Lichtenberg, E., & Zimmerman, R. (1999). Information and farmers' attitudes about pesticides, water quality, and related environmental effects. *Agriculture, Ecosystems & Environment*, 73(3), 227-236.

Llewellyn, R. S. (2007). Information quality and effectiveness for more rapid adoption decisions by farmers. *Field Crops Research*, 104(1-3), 148-156.

NASS (2002). *2002 Census of Agriculture*. Washington, DC: National Agricultural Statistics Service (NASS), U.S. Department of Agriculture.

NASS (2007). *Farm Computer Usage and Ownership*. Washington, DC: National Agricultural Statistics Service (NASS), U.S. Department of Agriculture.

ODA (2006). *2005 Annual Report*. Reynoldsburg, OH: Ohio Department of Agriculture, USDA National Agricultural Statistics Service, Ohio Field Office.

Ortmann, G. F., Patrick, G. F., Musser, W. N., & Doster, D. H. (1993). Use of private consultants and other sources of information by large cornbelt farmers. *Agribusiness*, 9(4), 391-402.

Patrick, G. F., & Ullerich, S. (1996). Information sources and risk attitudes of large-scale farmers, farm managers, and agricultural bankers. *Agribusiness*, 12(5), 461-471.

Rosenberg, A., & Turvey, C. G. (1991). Identifying management profiles of Ontario swine producers through cluster analysis. *Review of Agricultural Economics*, 13(2), 201-213.

Schneider, A., & Roberts, A. E. (2004). Classification and the relations of meaning. *Quality & Quantity*, 38(5), 547-557.

Schnitkey, G., Batte, M. T., Jones, E., & Botomogno, J. (1992). Information preferences of Ohio commercial farmers: Implications for Extension. *American Journal of Agricultural Economics*, 74(2), 486-486.

Suvedi, M., Campo, S., & Lapinski, M. K. (1999). Trends in Michigan farmer's information seeking behaviors and perspectives on the delivery of information. *Journal of Applied Communications*, 83(3), 33-50.

Suvedi, M., Lapinski, M. K., & Campo, S. (2000). Farmers' perspectives of Michigan State University Extension: Trends and lessons from 1996 and 1999. *Journal of Extension*, [On-line] Article 1FEA4, 38(1). Available at: <http://www.joe.org/joe/2000february/a4.php>

Ziehl, A., Thilmany, D. D., & Umberger, W. (2005). A cluster analysis of natural beef product consumers by shopping behavior, importance of production attributes, and demographics. *Journal of Food Distribution Research*, 36(1), 209-217.

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