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A Financial Training Program for USDA/FSA Borrowers: Evolution and Impacts

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A financial training program designed by Cooperative Extension specialists was provided to over 2,000 USDA/FSA borrowers from the Northeast during the period 1994–1999. Key to the success of the workshops was an in-depth, user-friendly curriculum that evolved over time, eventually replacing satellite-feed instruction with pre-taped videos. Cluster analysis classified nearly 70% of workshop participants as "Low Finance Priority" or "Low Finance Knowledge." Farmers in these clusters received a relatively greater educational benefit from the program than those not in these clusters. Impact analysis indicated that perceived annual gain in farm net worth from application of workshop tools ranged from approximately $5,000 to $10,000. The training addressed the needs of producers typically isolated from Cooperative Extension because the workshop was the only extension program attended that year by nearly two-thirds of them.

More than 2,000 farm operators, partners, and spouses in Delaware, Maryland, New York, and Pennsylvania completed a financial training program developed in response to a mandate in the 1991 U.S. Farm Bill requiring certain farmers with U.S. Department of Agriculture Farm Service Agency (FSA) operating and/or ownership loans to receive instruction in financial statements, budgeting, record keeping, and financial management practices (Federal Register 1993; Hanson 1995 (table 1)). In order to make the program more useful for FSA borrowers, the curriculum incorporated the FSA farm record system and accompanying financial statements format.[1] Because FSA is a lender of "last resort" to limited-resource producers, Cooperative Extension has historically viewed FSA clientele as critically important to its outreach mission (Hanson 1997).

The purpose of this paper is to describe the evolution and evaluate the effectiveness of this financial training program. Analysis is based on participant evaluations of the program and information about the participants collected during the workshops. In addition to tabulations of these data, cluster analysis and logit models are used in the analysis. This analysis is combined with descriptions of the evolution of the program.

Initial Curriculum and Workshops

The financial training workshops initially used satellite down-link presentations that would be coordinated locally by an on-site extension agent. Participants followed the satellite presentations and did exercises in their own workbooks. With an educationally diverse audience in mind, the curriculum emphasized practical applications and had minimal narrative. This format facilitated in-class

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[1] This program is unique in its adoption of the USDA/FSA record and financial statement format. Partly as a result of the direct linkage to the FSA record system and its success in the Northeast, this finance curriculum was selected for a nationwide program of training for more than 1000 FSA farm loan officers, county executive directors, and district directors from 1997–99.

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Table 1. Northeast Finance and Production Training: Farms, Attendees, 1995–99

Workshop Training Curriculum	Year	Farms Enrolled PA/non-PA	Basic Cost per Farm[a] PA/Non-PA ($)	Cost Per Person ($)	Farmers, Spouses, Partners PA/non-PA
FINANCE	1994/95	139	290/290	156	259
	1995/96	181/12	290/290	216	239/16
	1996/97	173/46	190/190	132	251/54
	1997/98	25/33	90/190	120	25/46
	1998/99	378/37	90/190	76	491/56
Finance Total	1995–99	1,024	182	130	1,437
PRODUCTION (PA)	1996/97	188	75	51	279
	1997/98	225	90	67	320
Production Total	1996–98	413	87	59	599
FINANCE and PRODUCTION TOTAL	1995–99	1,437	$155	$109	2,036

Source: Short Course Office, Penn State College of Agricultural Sciences.
[a]The basic charge does not include late fees and charges for more than two participants per farm. The $290 tuition fee included $90 for meals. The 1997/98 reduction in tuition to $90 in Pennsylvania reflects lower costs due to economies of size. The 1997/98 Pennsylvania finance training was a make-up program. Since 1997/98, Pennsylvania has rotated finance and production training in alternating years. The production training is presently offered only in Pennsylvania.

presentations via satellite of topics such as production-based accrual income. Major sections of the curriculum were "the balance sheet," "the income statement," "the cash flow budget," "financial ratio analysis," "farm home budgeting," "strategic planning," and "fixing broken finances." The workbook was prepared for a ninth-grade reading level to facilitate the participation of Old Order Amish producers, who do not attend high school, and other farmers with limited educational achievement. However, sufficient conceptual depth was included to challenge college-educated producers. A benefit of keeping the narrative to a minimum was that borrowers took ownership of the text by highlighting and writing notes pertaining to key finance concepts in the text.

In order to promote attendance and minimize participant travel time, concurrent workshops were scheduled in approximately 20 different accessible locations. Workshop duration was five to six hours per day, for six days. Agronomy, livestock, and farm business management agents were trained as workshop site leaders. In the first year of the program, an extension finance specialist presented the text material via satellite up-link from Penn State. This approach assisted the site instructors, many of whom had limited finance background, as well as promoted uniform teaching. No one single specialist could have delivered all of these lectures on site. The extension agents on-site coordinated training facility logistics and led text exercises, homework, and quizzes. The workshop began with a pretest, followed by text instruction on financial concepts and statements, numerical exercises, and quizzes after completion of each major topic. Each participant was required to complete a balance sheet, an accrual income statement, and a projected monthly cash flow for the coming year. Grades were "Pass," "Pass with additional FSA-led training required," and "Fail," and were based on attendance, effort on exercises, quizzes, and completion of own-farm homework. A panel of experts participated in two live satellite question-and-answer sessions that permitted participants to call or fax questions to Penn State.

Evolution of Instruction Methods

The official FSA evaluation indicated that 87% of the participants found the topics covered in 1994/95 to be helpful to the farm business (table 2). While coverage and suitability of the material were considered excellent by only 30% and 29% of the producers, respectively, approximately 80% found that the course level, course length, and amount of outside work were "appropriate." The percentage of respondents who gave ratings of "poor," "too easy," or "too short" ranged from only 0 to 5%.

Post-workshop discussions between the site leaders and the extension specialist leading the program revealed dissatisfaction with the rigid schedule of satellite up-links. Satellite instruction required that each site meet at the same time/date and complete workshop exercises on a tight schedule. Another problem was that signal reception was interrupted at several sites because of equipment failure. Accordingly, time dedicated to down-

Table 2. FSA/USDA Financial Management Training Participants Evaluations, 1994–99

Evaluation Item	Response to Evaluation Item	PA 1994/95 (%)	MD, NY, PA 1995/96 (%)	DE, MD, NY, PA 1996/97 (%)	DE, MD, PA 1998/99 (%)
Number of workshop participants completing evaluations		195	265	211	383
1. Topics covered in the class were helpful to me in my business	Yes	87	88	80	84
	Partially	13	12	20	16
	No	0	0	0	1
2. Coverage of the subject matter was	Excellent	30	55	56	48
	Sufficient	67	45	44	52
	Poor	3	0	1	1
3. Suitability of the instruction materials was	Excellent	29	48	43	44
	Sufficient	71	51	52	54
	Poor	0	1	5	3
4. The level of the course was	Too advanced	16	6	6	12
	Appropriate	83	93	91	86
	Too easy	1	1	3	2
5. The length of the course was	Too long	17	7	22	21
	Appropriate	78	89	73	74
	Too short	5	4	5	5
6. The amount of outside work was	Too much	9	6	14	15
	Appropriate	87	91	84	82
	Too little	4	3	2	3
7. The instructor(s) was	Excellent	30	55	76	64
	Good	66	44	24	35
	Poor	4	1	0	1
8. Will you continue to take training courses in production and financial management topics if not required?	Yes	38	36	30	22
	Maybe	56	54	57	55
	No	6	10	13	24
9. Would you recommend this instructor to other individuals?	Yes	74	85	92	89
	No comment	22	12	7	11
	No	4	3	1	1

links was reduced from six four-hour sessions in the first year to two one-hour sessions in the third year. As with other distance education programs at Penn State (Peterson 1999) and in other states (Hiel and Herrington 1997), distance education via satellite up-links had proven to be too cumbersome, rigid, and expensive compared to pre-taped video presentations, and so instruction by satellite was finally discontinued altogether in 1998–99. This evolution was beneficial mostly where the local down-link facility was inconveniently located for participants, too small to accommodate all participants, and/or where local scheduling conflicts existed. Cost savings generated from elimination of satellite instruction helped to reduce tuition from $290 to $90 in Pennsylvania, and to $190 in surrounding states. On-site extension agents, aided by pre-taped instructional videos, provided more of the instruction themselves. These changes permitted site leaders to exercise more control over the pacing of materials. The site instructors, whose knowledge about the subject had increased during the first two years of the program, felt confident about their ability to assume more instructional responsibility after the satellite program was discontinued. Increased instructor experience and the use of videos and on-site instruction probably all contributed to enhanced instructor ratings over time (table 2, item 7).

Beginning in 1995/96, participants were required to complete a four-year farm plan that included projected yields, expenses, revenues, projected capital expenditures, and family living expenses. In addition, the own-farm financial statements that participants were required to prepare were made more challenging. Text workbooks and farm plan booklets were revised annually, not only to keep them current but also to add improve-

Table 3. Evaluation Results from 1995–99 FSA Finance Workshops (PA, NY, MD, DE)

Participant Characteristics and Evaluation Items	Mean Values for Participants by Year		
	1995/96	1996/97	1998/99
1. Number of participant evaluations	180	151	364
2. Dairy major farm enterprise (%)	70.0	66.2	73.1
3. Number of cows in dairy herd	76.7	75.9	75.7
4. Annual farm sales (including contract income) ($)	$185,470	$171,520	$170,970
5. Age (yrs)	42.8[b]	42.7[c]	39.6[b,c]
6. Years managing a farm	16.7[b]	15.5	14.1[b]
7. Completed high school (%)	87.2[b]	86.8[c]	73.4[b,c]
8. Annual avg. farm profit past 3 years ($)	$19,310	$18,200	$17,740
9. Change in view of importance of financial management (Scale 1 to 5)	1.2[a,b]	0.9[a]	1.0[b]
10. Change in knowledge level of farm financial statements (Scale 1 to 5)	1.5[a]	1.4[a,c]	1.6[c]
11. Change in knowledge level of farm financial plans (Scale 1 to 5)	1.5	1.4	1.5
12. Budgeting, analysis, and planning tools from workshop will help your farm to survive (Scale 1 to 5)	3.9	4.0	3.9
13. Satisfaction with financial workshop (Scale 1 to 5)	4.0	4.0	3.9
14. Financial skills learned in this workshop will likely increase your farm's net worth per year ($)	$7490	$6900	$7330
15. Training-related increase in net worth as percent of sales (item 14 divided by item 4)	6.3	7.0	7.6
16. Participants not attending other extension workshops in past year (%)	72.6	64.6	68.6

[a]Statistically significant difference between 1995–96 and 1996–97 at $p < 0.05$ level.
[b]Statistically significant difference between 1995–96 and 1998–99 at $p < 0.05$ level.
[c]Statistically significant difference between 1996–97 and 1998–99 at $p < 0.05$ level.

ments suggested by site leaders and participants. For the same reasons, the instructional video tapes used in the third year were also remade, including being shortened by 30–40%. Pennsylvania and Maryland extension specialists and agents were the instructors on these revised tapes.

In 1997/98, Farm Production Management was taught instead of finance. This one-year break in the finance curriculum permitted an in-depth revision of its text and instructional format, to correct mistakes and clarify material. These changes in the instructional format resulted in improved evaluations, the "coverage of subject matter" and "suitability of instruction material" receiving an "excellent" rating by a respective 55% and 48% of the participants (table 2). Although unfavorable ratings increased over time in three of the evaluation categories (on the length of the course, the amount of work required outside the classroom, and the amount of interest in taking additional courses on the same subjects if not required to do so), the rest of the categories, including those pertaining to instructors, continued to receive favorable ratings.

An additional evaluation instrument was added in 1995/96. The purpose of this instrument was to provide information on participant characteristics, change in knowledge levels, and perceived potential impact of the training on net worth accumulation (table 3). Three items (9–11) are producer assessments of their beginning and ending knowledge levels of financial topics, and four items (12–15) are self-assessments of workshop satisfaction and impacts. It is important to note that changes in knowledge levels and impacts of knowledge are

Table 4. Evaluation Results by Education Level, 1998–99 FSA Workshops (PA, MD, DE)

Participant Characteristics and Evaluation Items	Mean Values for Participants by Education Level		
	Primary	High School	College
1. Percent of participants	24.4	58.0	17.6
2. Dairy major farm enterprise (%)	92.0[a,b]	70.7[a,c]	54.8[b,c]
3. Number of cows in dairy herd	51.5[a,b]	89.3[a]	75.6[b]
4. Annual farm sales (including contract income) ($)	$127,920[a]	$185,800[a]	$184,200
5. Age (yrs)	32.7[a,b]	42.2[a]	40.9[b]
6. Years managing a farm	9.3[a,b]	16.5[a]	14.1[b]
7. Annual avg. farm profit past 3 years ($)	$14,430[a]	$20,350[a,c]	$12,010[c]
8. Change in view of importance of financial management (Scale 1 to 5)	1.2	1.0	0.9
9. Change in knowledge level of farm financial statements (Scale 1 to 5)	1.5	1.6	1.7
10. Change in knowledge level of farm financial plans (Scale 1 to 5)	1.5	1.4	1.7
11. Budgeting, analysis, and planning tools from workshop will help your farm to survive (Scale 1 to 5)	3.9	4.0	4.0
12. Satisfaction with financial workshop (Scale 1 to 5)	3.6[a,b]	3.9[a]	4.1[b]
13. Financial skills learned in this workshop will likely increase your farm's net worth per year ($)	$6520	$7900	$6720
14. Training-related increase in net worth as percent of sales (item 14 divided by item 4)	6.3	7.7	6.4
15. Participants not attending other extension workshops in past year (%)	73.3	69.1	61.7

[a]Statistically significant difference between primary and high school education at $p < 0.05$ level.
[b]Statistically significant difference between primary and college education at $p < 0.05$ level.
[c]Statistically significant difference between high school and college education at $p < 0.05$ level.

difficult for both resident and extension educators to assess. However, the consistency of the self-assessment scores over the years supports the view that workshop participants experienced little difficulty answering the impact questions.

Data in table 3 indicate that the typical participant had managed a farm for about 15 years, was about 40 years old, and had annual farm sales of approximately $170,000–$185,000. The view that financial management was important and the knowledge levels of farm financial statements and farm financial plans all increased substantially after taking the course (table 3, items 9–11). The rating of 3.9–4.0 (on a scale of 1 to 5) indicated that the participants believed that the tools learned at the workshop would help their farms to survive. Participants estimated that implementing the workshop farm/household analysis and planning tools could increase farm net worth by an average of about $7,000 in a typical year. As shown by a rating of 3.9–4.0 (on a scale of 1 to 5), the participants expressed a high degree of overall satisfaction with the workshop. The information provided on this evaluation also suggests that the training addressed the needs of producers typically isolated from Cooperative Extension—the workshop was the only extension program attended that year by nearly two-thirds of them.

Workshop Evaluations by Education Level and Farm Size

Using data from the evaluation instrument, evaluations were tabulated based on educational level (table 4) and farm size of the participants. Partici-

Table 5. Evaluation Results from 1998–99 FSA Finance Workshops by Gross Sales

Participant Characteristics and Evaluation Item	Mean values for participants by farm sales: Sales less than $100,000	Sales $100,000 to $199,999	Sales greater than $200,000
1. Percent of participants	36.3	37.3	26.4
2. Dairy major farm enterprise (%)	60.5[a,b]	83.8[a]	81.9[b]
3. Number of cows in dairy herd	55.9[b]	59.8[c]	126.0[b,c]
4. Annual farm sales (including contract income) ($)	$55,750[a,b]	$138,500[a,c]	$379,110[b,c]
5. Age (yrs)	37.7[b]	39.4[c]	43.1[b,c]
6. Years managing a farm	11.9[b]	13.7[c]	18.1[b,c]
7. Completed high school (%)	79.5	64.9	86.6
8. Annual avg. farm profit past 3 years ($)	$12,610[a,b]	$17,530[a,c]	$24,610[b,c]
9. Change in view of importance of financial management (Scale 1 to 5)	1.2[b]	1.0	0.8[b]
10. Change in knowledge level of farm financial statements (Scale 1 to 5)	1.7	1.5	1.5
11. Change in knowledge level of farm financial plans (Scale 1 to 5)	1.6[b]	1.4	1.3[b]
12. Budgeting, analysis, and planning tools from workshop will help your farm to survive (Scale 1 to 5)	3.9	3.9	4.0
13. Satisfaction with financial workshop (Scale 1 to 5)	3.9	3.8	4.0
14. Financial skills learned in this workshop will likely increase your farm's net worth per year ($)	$5300[a,b]	$8050[a]	$10,150[b]
15. Training-related increase in net worth as percent of sales (item 14 divided by item 4)	12.2[a,b]	6.0[a,c]	3.6[b,c]
16. Participants not attending other extension workshops in past year (%)	65.4	69.4	70.0

[a]Statistically significant difference between low sales and medium sales at $p < 0.05$ level.
[b]Statistically significant difference between low sales and high sales at $p < 0.05$ level.
[c]Statistically significant difference between medium sales and high sales at $p < 0.05$ level.

pants in 1998–99 who had completed at least high school reported approximately $185,000 gross revenue. However, those who had completed high school but not college were more specialized in dairy, had more cows per herd, and reported about $8,000 more in profit than those who had gone to college. The greatest change in views of the importance of financial management was shown by the lowest education group, which included the Amish farmers. The change in knowledge variables and satisfaction with the workshop tended to increase with education level. As expected, college-educated participants attended more extension meetings. Overall, the evaluations indicate that the training had similar impacts on knowledge levels for participants at all education levels, even though the workshop experience was more satisfactory for better-prepared college-educated participants.

Evaluations were also tabulated by the amount of gross sales reported by the participants into three groups—those reporting sales greater than $200,000, $100,000–$199,999, and less than $100,000 (table 5). The one with the largest gross sales reported less knowledge gain in terms of statements and plans than did the group with the least sales. The higher-sales group did find the workshop slightly more satisfactory and slightly more beneficial in terms of helping their business survive than did the other group, even though the difference was not statistically significant. The

Table 6. Evaluation Characteristics from 1998–99 FSA Finance Workshops by Cluster

Participant Characteristics and Evaluation Items	Cluster: Low Finance Priority Cluster 1 (n = 135)	Low Finance Knowledge Cluster 2 (n = 113)	High Finance Knowledge Cluster 3 (n = 114)
1. Percent of participants	37.3	31.2	31.5
2. Dairy major farm enterprise (%)	73.3	69.0	76.3
3. Number of cows in dairy herd	74.4[a,b]	65.5[a,c]	86.6[b,c]
4. Annual farm sales ($)	163,047[a,b]	128,626[a,c]	225,221[b,c]
5. Age (yrs)	40.3	38.1	40.2
6. Years managing a farm (yrs)	14.0	12.7	15.8
7. Completed high school (%)	74.2	75.0	78.0
8. Annual avg. farm profit past 3 years ($)	15,682[b]	15,006[c]	22,285[b,c]
9. Change in view of importance of financial management (Scale 1 to 5)	1.8[a,b]	0.8[a,c]	0.3[b,c]
10. Change in knowledge level of farm financial statements (Scale 1 to 5)	1.7[b]	2.0[c]	1.0[b,c]
11. Change in knowledge level of farm financial plans (Scale 1 to 5)	1.6[b]	1.9[c]	0.8[b,c]
12. Budgeting, analysis, and planning tools from workshop will help your farm survive (Scale 1 to 5)	4.1[a]	3.8[a]	3.9
13. Satisfaction with financial workshop (Scale 1 to 5)	3.9	3.9[c]	3.9[c]
14. Financial skills learned in this workshop will likely increase your farm's net worth per year ($)	7233[b]	6778[c]	8077[b,c]
15. Training-related increase in net worth as percent of sales (items 14 divided by 4)	9.0[a,b]	6.8[a]	6.5[b]
16. Participants not attending any other extension workshops in past year (%)	67.4	62.8	58.8
17. Percent of Amish participants	17.8	20.4	16.7

[a]Statistically significant difference between cluster 1 and cluster 2 at $p < 0.05$ level.
[b]Statistically significant difference between cluster 1 and cluster 3 at $p < 0.05$ level.
[c]Statistically significant difference between cluster 2 and cluster 3 at $p < 0.05$ level.

group with the highest gross sales also gave the potential impact of the workshop on annual growth in farm net worth the highest dollar value. However, the group with the lowest amount of gross sales gave a higher rating than the other groups for the potential of the workshop to increase net worth as a percent of sales. The group with highest gross sales entered the workshop better prepared; their pre-workshop scores for items 9–11 were each about 0.4 larger than for the groups with the lowest in gross sales. The post-workshop scores for these items were only about 0.2 larger for the highest gross sales group than the group with the smallest sales. Thus, a general conclusion is that the training succeeded for all education and farm sales levels.

Cluster Analysis of Workshop Participants

Tabulations by single variables were helpful in evaluating the success of the workshops. However, analysis for groups defined by several variables further refined the evaluation. Cluster analysis was utilized to delineate groups in a multivariate framework for further analysis. Variables used in the cluster analysis were pre-workshop beliefs participants had on several topics: (1) their view of the importance of financial management, (2) their knowledge about farm financial statements, and (3) their knowledge about farm financial plans. Changes in these variables (items 9–11, table 3) were tabulated in tables 5 and 6). The approach of cluster analysis is based on the view that partici-

pants with similar perspectives and knowledge levels could be characterized by a similar set of characteristics (Bernhardt et al. 1996). It is assumed that participant knowledge can be analyzed in terms of clusters that broadly share similar characteristics as

$$C_1 = f_1(B_k),\ k = 1,2,\ldots,K$$
$$C_2 = f_2(B_l),\ l = 1,2,\ldots,L$$
$$C_M = f_M(B_z),\ z = 1,2,\ldots,Z,$$

where C_i ($i = 1,2,\ldots,M$) represents the ith cluster and B_j ($j = k,l,\ldots z$) is a set of characteristics associated with the ith cluster. These cluster profiles are mutually exclusive. The FASTCLUS procedure in SAS (SAS/STAT Users Guide 1989) was used to determine the number of clusters and to group the participants.

The three clusters identified in the analysis can be described as "Low Finance Priority," "High Finance Knowledge," and "Low Finance Knowledge" (table 6).' The 135 participants identified with a Low Finance Priority had an average score of 2.59 (scale of 1–5) on their initial view of the importance of financial management. However, this group had the largest change in their view of financial management. The Low Finance Priority group also had a strong belief that the financial tools acquired in the workshop would help their farms to survive, with an average score of 4.1 on a scale of 1 to 5. Given their initial low priority for finance, it is not surprising that the change in finance knowledge was substantial for the Low Finance Priority group.

The 113 members of the Low Finance Knowledge cluster had the largest increase in knowledge of financial statements and planning and estimated that use of workshop concepts would raise annual net worth by 6.8 percent (item 15, table 6). The sales level of this group indicates the presence primarily of small farmers. The High Finance Knowledge cluster scored the lowest on change in view that use of workshop tools would contribute to farm survival, and they also had the smallest increase in knowledge of financial statements and planning. Most importantly, the post-workshop view of the importance of financial management converged between 4.4 and 4.8 for the three clusters, and knowledge of financial statements and plans ranged from 3.8 to 4.3, suggesting that the workshop tended to make the ending finance knowledge and finance perspective similar for the three clusters. The cluster analysis isolated the participants with low finance knowledge and a negative belief in the importance of finance. These two groups would be expected to gain less from the workshop than individuals with more knowledge and/or more positive beliefs. The fact that their post-workshop knowledge and beliefs had become nearly as high as the group with higher knowledge initially indicated that the curriculum allowed these potentially problem participants to fully participate and become finance-literate.

Logit models (Madalla 1983) were estimated for further comparison of each cluster to the other two clusters. These models considered characteristics of each cluster in a multivariate framework rather than in the univariate tabulations discussed above. Each model has the same set of explanatory variables, which are defined as being 1 when the group of participants (cluster *i*) has the characteristics, and 0 when it does not:

$$\log\,[P_i/(1 - P_i)] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_{16} X_{16} + e_i,$$

where

Pi = probability that the respondent belonged to the group (cluster)
X_1 = change in the view of the importance of financial management (scale of 1 to 5)
X_2 = change in the level of knowledge of farm financial statements (scale of 1 to 5)
X_3 = change in the level of knowledge of farm financial plans (scale of 1 to 5)
X_4 = 6–10 years of farm management experience
X_5 = more than 10 years of farm management experience
X_6 = moderately satisfied with workshop (score of 4 on scale of 1 to 5)
X_7 = highly satisfied with workshop experience (score of 5 on scale of 1 to 5)
X_8 = farm sales greater than $100,000
X_9 = off-farm income of $1–$7500
X_{10} = off-farm income greater than $7500
X_{11} = workshop skills will increase net worth $1–$5,000
X_{12} = workshop skills will increase net worth more than $5000
X_{13} = typical profit $0–$10,000
X_{14} = typical profit greater than $10,000
X_{15} = did not attend any other extension workshops in past year
X_{16} = Amish farmer.

The regression coefficients are in the appendix. Given that the explanatory variables are binary, odds-ratios were computed instead of marginal probabilities (Hosmer and Lemeshow 1989). These odds are used to analyze differences in characteristics among the clusters. The odds of an outcome being present when a predictor variable (X) is equal to one is defined as $\pi(1)/[(1 - \pi(1)]$. The

Table 7. Logistic Regression Odds Ratio from 1998–99 FSA Finance Workshops by Cluster

Regression Variable	Low Finance Priority Cluster 1 (n = 135)	Low Finance Knowledge Cluster 2 (n = 113)	High Finance Knowledge Cluster 3 (n = 114)
1. Intercept	0.168	0.073	7.363
2. Change in the view of the importance of financial management	13.204***	0.205***	0.171***
3. Change in the knowledge level of farm financial statements	0.527**	4.350***	0.289***
4. Change in the knowledge level of farm financial plans	0.741	2.722***	0.329***
5. Farm management experience: 6–10 yrs	1.166	0.706	1.824
6. Farm management experience: more than 10 yrs	1.456	0.775	1.001
7. Moderately satisfied with workshop	0.453**	0.666	4.264***
8. Highly satisfied with workshop	0.368**	0.708	5.086***
9. Farm sales greater than $100,000	0.955	0.630	2.214
10. Off-farm income: $1–$7500	0.711	1.314	0.884
11. Off-farm income: more than $7500	1.017	1.681	0.497*
12. Workshop skills will increase farm net worth between $1–$5000	1.525	0.672	1.647
13. Workshop skills will increase farm net worth by more than $5000	1.153	1.082	0.808
14. Typical profit: $0–$10,000	1.222	0.661	1.277
15. Typical profit: greater than $10,000	1.087	0.560*	1.601
16. Participants not attending any other extension workshops in past year	1.115	0.932	0.858
17. Amish producer	0.618	2.119*	1.174

*Logistic regression parameter estimate statistically significant at $p < 0.10$ level.
**Logistic regression parameter estimate statistically significant at $p < 0.05$ level.
***Logistic regression parameter estimate statistically significant at $p < 0.01$ level.

odds ratio, denoted by Ψ, is defined as the ratio of the odds for $X = 1$ to the odds for $X = 0$, given by

$$\Psi = A/B, \text{ where,}$$
$$A = \pi(1)/[(1 - \pi(1)] \text{ and}$$
$$B = \pi(0) / [(1 - \pi(0)].$$

In simple terms, an odds ratio of two implies that when $X = 1$ the outcome (event) is twice as likely, while an odds ratio of 0.5 would suggest the event is only half as likely to occur.

Computed odds ratios are in table 7. Compared to the other two groups, the odds were higher that members of the Low Finance Priority cluster would have a much larger change in perception of the importance of financial management, tend to have more than 10 years of farm management experience, be less satisfied with the workshop experience, and view workshop skills as contributing strongly to net worth growth. For example, the odds were greater than 1.0 (1.46) that a member of the Low Finance Priority group would have more than 10 years of farm management experience. The odds were only about 0.4 that a member of the Low Finance Priority group would end the workshop moderately or highly satisfied with the learning experience, which suggests that they were more likely to not be in these categories.

Members of the Low Finance Knowledge group were more likely to have a large change in the knowledge level of financial statements and plans, respectively 4.35 and 2.72. Members of this cluster also tended to have less farm management experience, more off-farm income, and to be less satisfied with the workshop experience. Members of both the Low Finance Priority and Low Finance Knowledge clusters tended to find the workshop less satisfying than the High Finance Knowledge cluster. Thus, we surmise that the lower the finance knowledge and priority, the harder the producers had to work to master the finance concepts, and the

more unfamiliar the topic, the less satisfying the learning experience. Note that the Amish farmers were about twice as likely to be members of the Low Finance Knowledge cluster. The odds were 1.82-to-1.0 that members of the High Finance cluster would have 6–10 years of farm management experience, and that 2.21-to-1.0 members of this cluster would have farm sales greater than $100,000. The odds were about 1.6-to-1 that a High Finance Knowledge member would estimate that workshop skills could increase farm net worth gains annually by $1,000–$5,000. Thus, logit analysis of the clusters allowed us to identify and understand the differences in impacts of the workshop and farm characteristics among the clusters.

Concluding Comments

The borrower training program addressed outreach education issues that are frequently critical to workshop success. In-depth workshops with several days scheduled for presentations, exercises, and homework are ideal for training on complex topics such as agricultural finance. That stated, the logistics of organizing concurrent workshops requires a sharp focus on information presentation efficacy. In our case, the more high-tech satellite up-link approach was not sufficiently flexible to accommodate the scheduling and workshop leadership needs of the typical county agent. The drawback with using pre-taped videos, the alternative, was that careful editing and frequent updating of the tapes were required to accommodate changes made to curriculum text materials.

A key finding of this study is that the finance workshops were very successful in terms of knowledge gains and potential impacts on net worth growth and farm survival for most participants. The cluster and logit analysis provided some more specific information for subsets of participants. It is noteworthy that the small farm and lower-educated participants benefited relatively more in terms of change in knowledge of financial statements and planning than their neighbors with more education and larger farms. Obviously, writing the text at a lower level than most extension materials, emphasizing exercises, and repetition and review were elements of the curriculum that made it accessible to these less-educated participants from smaller farms. However, a key challenge is to develop educational approaches that increase the satisfaction levels of these less prepared and motivated participants, in this case the Low Finance Priority and Low Finance Knowledge producers. Clearly, these two clusters entered the workshop with more deficiencies than the High Finance Knowledge group. This uncomfortable learning challenge needs to be made as positive as possible without lowering the knowledge achievement standards of the course.

Two other important impacts from the training experience were that agronomy and dairy science agent site leaders became more knowledgeable of and confident with agricultural finance concepts, to the point where several chose to present the materials themselves rather than to use video-tape presentations. In addition, Cooperative Extension was able to integrate clientele previously not reached by extension programs. Finally, a challenge for Cooperative Extension is to cultivate ties with organizations such as FSA/USDA so that our strengths as educators can be employed with producers who otherwise would not take the time to master difficult concepts. The borrower training workshops will ultimately enhance USDA and Cooperative Extension partnerships in working with minimum resource producers.

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Appendix Table. Logistic Regression Results from 1998–99 FSA Finance Workshops by Cluster

Regression Variable	Parameter Estimates: Low Finance Priority Cluster 1 (n = 135)	Low Finance Knowledge Cluster 2 (n = 114)	High Finance Knowledge Cluster 3 (n = 113)
1. Intercept	−1.781	−2.619	1.996
2. Change in the view of the importance of farm financial management	2.581***	−1.584***	−1.767***
3. Change in the knowledge level of farm financial statements	−0.640**	1.470***	−1.241***
4. Change in the knowledge level of farm financial plans	−0.299	1.002***	−1.113***
5. Farm management experience: 6–10 yrs	0.154	−0.348	0.601
6. Farm management experience: more than 10 yrs	0.376	−0.255	0.001
7. Moderately satisfied with workshop	−0.793**	−0.406	1.450***
8. Highly satisfied with workshop	−0.999**	−0.345	1.627***
9. Farm sales greater than $100,000	−0.046	−0.463	0.795
10. Off-farm income: $1–$7500	−0.341	0.273	−0.123
11. Off-farm income: more than $7500	0.017	0.520	−0.699*
12. Workshop skills will increase farm net worth between $1–$5000	0.422	−0.398	0.499
13. Workshop skills will increase farm net worth by more than $5000	0.142	0.079	−0.213
14. Typical profit: $0–$10,000	0.200	−0.414	0.245
15. Typical profit: greater than $10,000	0.084	−0.580*	0.471
16. Participants not attending any other extension workshops in past year	0.109	−0.071	−0.153
17. Amish farmer	−0.482	0.751*	0.161

*Parameter estimate statistically significant at $p < 0.10$ level.
**Parameter estimate statistically significant at $p < 0.05$ level.
***Parameter estimate statistically significant at $p < 0.01$ level.