Are Extension Education Programs Effective?

Impacts of a Program to Assist Limited Resource and Socially Disadvantaged Farmers

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Introduction

In recent years, limited-resource farmers in Virginia have been helped by a technical assistance program administered by Virginia State University (VSU), Virginia's 1890 Land-Grant institution. The Virginia Small Farm Outreach, Training, and Technical Assistance Program (Small Farm Program), with partial support from the United States Department of Agriculture (USDA),[1] has provided technical, management, and other income-enhancing information services to socially-disadvantaged and limited-resource farmers (Box 1). The program assists farmers in filling out loan applications and other program applications for Farm Service Agency programs, record keeping and budgeting, preparing farm and home plans, developing marketing plans, developing alternative enterprises, and educating farmers about how to identify and address risks associated with farming. Agriculture Management program agents visit clients' homes and organize field days, workshops, and production meetings for program participants. In Virginia, the program currently reaches approximately 800 farmers.

Box 1. Definitions of eligibility for the USDA-funded Outreach and Assistance for Socially Disadvantaged Farmers and Ranchers Program, Title XXV Sec. 2501

Eligible institutions include "1890 Land-Grant Institutions, Indian Tribal Community College, Alaska Native cooperative colleges, Hispanic serving post-secondary educational institutions, or other post-secondary educational institutions" and some community-based organizations (US Dept. Health & Human Services). Socially disadvantaged include "a group whose members have been subject to racial, ethnic, or gender prejudice because of their identity as members of the group without regard to their individual qualities. Socially disadvantaged groups consist of women, African-Americans, Native Americans, Alaskan Natives, Hispanics, Asians and Pacific Islanders."

"Limited Resource Producers have one or more of the following characteristics:

a) Gross farm sales average $40,000 or less in each of the last 3 years and there is no non-farm income.

b) Total household net income, farm and non-farm, is 75 percent or less of the non-metropolitan median income level for the state or county.

c) Lack of access to capital, labor, or equipment.

d) Farm or ranch size is significantly smaller than average size.

e) Social, cultural, customs or language barriers, minimal awareness of USDA programs, limited management skills, the level of formal education is below the county average or under-educated, and are less likely to take business risks and adopt new technology." (USDA)

The federal government has provided the bulk of the funding for the Small Farm Program with supplemental funds provided by the Commonwealth of Virginia. However, in a period of scarce funds and increased demand for accountability by funding agencies and other stakeholders, institutions charged

[1] Through USDA's Outreach and Assistance for Socially Disadvantaged Farmers and Ranchers Program, Title XXV Sec. 2501 of the Food, Agriculture, Conservation, and Trade Act of 1987.

with implementing extension and outreach programs are challenged to "develop meaningful outcome measures that allow for adequate determination of their effectiveness and returns on public investment in these programs" (Essel *et. al*., p.20, 1999). In addition to helping justify levels of public investments, quantitative information about the benefits derived from extension programs can guide program design and help allocate resources within a given program.

To date, little systematic effort has been made to quantitatively link public extension investments to program outcomes such as improvement in farm profits and farm financial position. The main objective of the research presented in this paper is to describe how well the Small Farm Program in Virginia meets its primary goal of raising incomes of program participants. Now is an opportune time to conduct such a review as the Federal Government recently indicated it is considering expansion of the program.

The economic (income) impacts of the Program are measured by the effects on the net farm incomes of eligible farmers in Virginia compared to those who do not participate. Appropriate models are used to measure the influences on farm income of program participation as opposed to other factors that might be expected to affect farm income. Since the Small Farm Program deliberately targets socially disadvantaged and limited resource farmers, comparisons of incomes between participants and any group of nonparticipants will likely show that, on average, participants have lower farm incomes than nonparticipants. The models are designed to control for that fact so that the true effect of the program on participants can be assessed regardless of their starting incomes.

Background on Small Farm Program

The Small Farm Program, begun in 1993, provides educational programs in 42 counties in eight areas of the state (Figure 1). The program agent educates participants on how to keep records and their use for decision making; looks at the operation and helps with production practice information; provides information about government programs in agriculture, assists in completing the applications, and follows up with the progress of the application; provides information and on-farm demonstrations for alternative enterprises; and educates farmers about identifying and addressing production, legal, and marketing risks associated with farming. Much of the program agent's work is conducted one-on-one with the program participant. Over its nine-year life, the Virginia Small Farm Program has reached well over the 800 farmers currently enrolled.

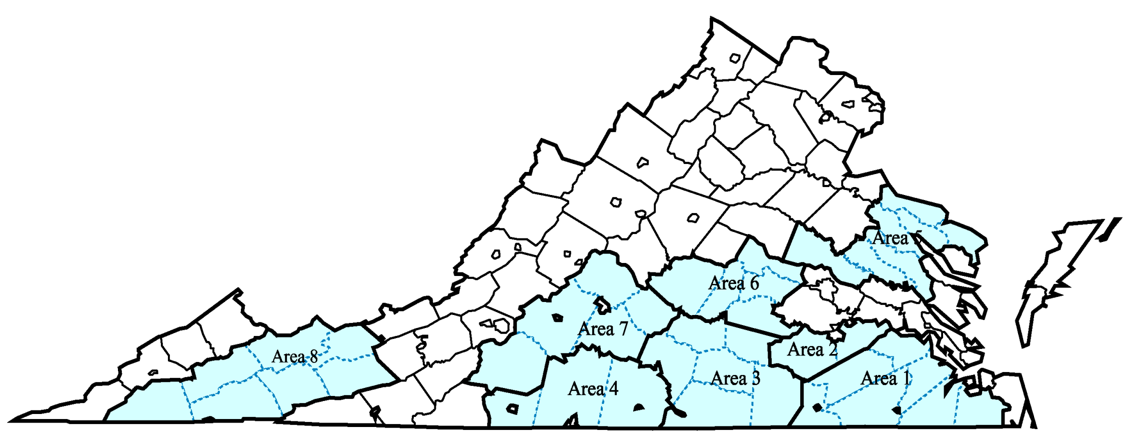

Figure 1. Counties with participants in the Virginia Small Farm Program

Factors Affecting Program Participation

The impacts of the Small Farm Program were analyzed by examining how program participation and other factors such as asset ownership, acreage farmed, household characteristics, and program participation contribute to net farm income. The influence of program participation was separated from the effects of these other factors. To isolate this influence correctly, the factors affecting program participation must also be accounted for. These factors include individual and farm-level characteristics such as education, age, acreage, and assets. Other factors likely to affect participation are the distance to the nearest Farm Service Agency office and if the person has been rejected for a loan. Besides simply participating in the Small Farm Program, an increased level of participation may also raise farmers' incomes. Level of participation is measured as the number of visits made by program agents to program participants.

Measurement is completed in two stages. First, the influence that various factors have on the likelihood of participating and on the level of participation are assessed, and second, the influences that participation, level of participation, and other factors have on net farm income are measured. The procedure used to evaluate the impacts of participation and level of participation in the program is similar to that used in other studies of participation in programs such as the Food Stamp Program or other social welfare programs (Levedahl, 1995; Capps and Kramer, 1985). In all the studies of why people participate in the various programs, income plays a significant role in explaining their decision to participate. A recent study of farmer participation in U.S. Farm Programs found income to be the best predictor of farmers' attitudes and behaviors (Thomas and Thigpen, 1996).

Based on discussions with program agents and a review of studies of extension program participation, we hypothesized that a number of factors help explain why farmers do or do not participate:

- Acreage farmed, together with the value of assets held by the household, because benefits from participation will increase with these factors;
- Farmers with higher levels of debt because these farmers might be targeted by the program agent or may themselves seek help of the sort offered by the program;
- Years of experience farming combined with higher levels of education;
- Minority farmers because they are targeted by the program;
- Prior visits by extension agents to the farm;
- Whether a farmer has been turned down for a loan—one of the criteria for acceptance into the Small Farm Program;
- Part-time farmers as measured by the dollar value of off-farm income;
- Those whose main enterprise is beef production; and
- The distance (in miles) to the Farm Service Agency office because distance reflects some of the costs of program participation.

Factors Affecting Net Farm Income

In addition to program participation and level of participation, several other factors are expected to determine farm income. Many of the same factors also affect program participation. Factors expected to be associated with net farm income are the following:

- Acreage and the value of assets,
- Experience farming and level of schooling of the farm operator,
- Household size because it is associated with the availability of unpaid labor for the farm;
- Off-farm income, and
- Primary source of farm income being beef.

Data Collection and Descriptive Statistics

To compare farm incomes of participants with those of nonparticipants, both groups were sampled. VSU provided a list of 400 participating farmers. The Virginia Agricultural Statistics Service (VASS) was asked to select a group of 400 farmers whose racial composition, asset positions, and farm income situations mirror those of the participating group supplied by VSU. Like the VSU group, the VASS group was composed of farmers whose gross annual sales do not exceed $150,000. Both groups were surveyed using a mail survey and, in the case of a non-response, a phone call.

After the questionnaire was pilot-tested and revised during the fall 2000, VASS mailed the questionnaire to the 800 farmers during winter 2000 - 2001. Non-responses were a major problem, resulting in only 205 usable questionnaires. Non-responses included non-farmers who responded to the survey, and deceased, absent, or otherwise unavailable farmers.

It is not surprising that farmers filling out the survey would omit questions about their financial situation. What is more telling is that a substantial number of farmers do not know the distance to either their local Farm Service Agency or their local Extension office. Not knowing the distance to these offices could have an adverse effect on the farmer's income level if the various programs offered by Farm Service Agency and/or Virginia Cooperative Extension are generally effective in boosting farm incomes.

Characteristics of Participants and Nonparticipants

The net farm income and off-farm income in Table 1 are calculated as the average of the previous three years of net farm income and off-farm income, respectively. Participants in the program have higher net farm incomes, larger acreage, and slightly higher asset values than nonparticipants. Participants, however, have lower levels of schooling, are more likely to be black, and have higher debt loads. Nearly 73 percent of Small Farm Program participants finished high school and/or attended college while nearly 80 percent of nonparticipants finished high school and/or attended college. Participants are also more likely to have been turned down for a loan and are more likely to have been visited in the past by a program agent than are nonparticipants.

The level of program participation is represented by the number of visits that a participant received from a program agent (Table 2). A program agent visits each participant at least once. Some of these initial visits are farmer initiated and some program agent initiated. After the initial visit, the program agent generally takes responsibility for follow-up visits.[2]

[2] The relevant survey question asks whether the respondent has received, in recent years, any assistance from a program agent. Some farmers, who were visited only once by a program agent, may not have considered the visit to be "assistance."

[3] Statistics can be used to measure the significance of relationships between variables based on a sample rather than the entire population. When a sample is used, we wish to know if that sample reflects the general population. In the present case, we wish to know if participation in the small farm program will benefit other farmers. Statistical significance refers to whether this uncertainty is small enough for us to be relatively certain that the findings are not due to accident. When a lot of uncertainty exists, findings may be due to accident. When we say effects are statistically significant, we are saying that we are fairly certain (90 to 95 percent certain) that the result is not due to accident.

Table 1. Variable Descriptions and Summary Statistics.

	Mean	
Dependent Variables	***Participants (N=73)***	***Non-participants (N=132)***
Average net farm income, past 3 years	$14,384	$10,853
Number of visits by program agent	5.2	not applicable
Independent Variables		
Acreage	225.1	181.7
Average non-farm income, past 3 years	$37,740	$37,936
Value of household and farm assets	$171,849	$162,367
Percent of black farmers	64.4%	43.9%
Years in farming	29.8	26.2
Percent of farmers completing high school	32.9%	37.1%
Percent of farmers attending or completing college	39.7%	42.4%
Number of household members	2.5	2.6
Percent having primary farm income from beef	30.1%	34.8%
Miles to nearest Farm Service Agency office	12.2	12.6
Percent of farmers turned down for a farm-related or bank loan	21.9%	15.1%
Percent of farmers visited by program agent before 1990	26.0%	9.1%
Value of household debt	$67,603	$56,913

Table 2. Number of visits program agent made to all respondents

Number of visits	Percent of respondents
0	69
1	9
2-4	10
5-8	8
9-15	3
16-20	1

Results

To measure the impact of the Small Farm Program on net farm income, the factors that affect whether an eligible farmer participates in the program and the factors that affect the number of visits by program agent, as noted earlier, must all be examined. Of all the factors used, only race (person is black) and a visit by a program agent prior to 1990 are statistically significant[3] in determining current participation in Small Farm Program. Only those factors that are statistically significant are shown in tables 3 and 4. The factors are shown as increasing or decreasing the likelihood of participating or the level of participation. Black farmers and those farmers receiving assistance from extension prior to 1990 were both more likely to participate in the program (Table 3). Farm size, level of income earned off the farm, farm financial position, and household characteristics had no significant impact on program participation. A person being turned down for a loan is one of the targeting criteria for the Virginia Small Farm Program, but oddly enough, it is not a statistically significant determinant of program participation.

Table 3: Factors Influencing Participation and Level of Participation in the Program

	Effect on	
Factor	***Participation***	***Level of participation***
Farmer is minority	increases	increases
Farmer was visited by program agent before 1990	increases	increases
Primary farm income is from beef cattle	not significant	decreases
Value of household debt	not significant	increases

Efforts to understand what determines the level of participation in the program, as measured by the number of program agent visits, were more satisfactory. In addition to race and visits by program agents prior to 1990, the primary income source from beef production and farm debt were statistically significant. As expected, farmers with higher debt loads were likely to receive more visits from the program agent; and beef producers, though they were no more or less likely to participate, received fewer visits, once they decided to participate.

In Virginia, more than 95 percent of farm operators report working off the farm, and 40 percent work more than 200 days off the farm (1997 Census of Agriculture). With the farm operator working off the farm, he/she has less time to manage the farming operation. Less time spent managing the farming operation generally results in lower net farm income (Table 4). Beef production is often associated with part-time farming because it does not necessarily require a lot of management time.

Table 4. Factors impacting net farm income

	Participation	*Level of participation*
Off-farm income	decrease	decrease
Assets	increase	increase
Race	decrease	decrease
Household size	increase	increase
Primary farm income from beef	decrease	not significant

More financial assets are clearly associated with higher farm incomes, and households with more members also show higher net farm incomes. This latter finding is attributable to a labor effect: more household members translates into more unpaid workers on the farm, which mean lower costs and higher farm incomes. Oddly, experience and higher educational levels do not significantly contribute to net farm incomes. Additional visits may not be as high as $3,000 as the number of visits increases. However, even if the benefits were only $3,000 per farm in total, the benefits well exceed the costs of the program.

Conclusions

The program agents' role in the Small Farm Program is primarily educational and informational. The program agents teach participants how to keep records and use these records to make management decisions. They visit the farms, help the farmers identify production problems, and provide resources for correcting the problems. They provide information to the farmers about government programs for which the farmer may be eligible, especially loan programs. When the farmer decides to apply for one of the programs, the program agent helps him/her complete the application and then follow up with the appropriate agency, usually Farm Service Agency. The program agents provide information and on-farm demonstrations on alternative enterprises. They also educate farmers on how to identify and address the risks associated with farming. These risks include marketing, liability, and management. The one-on-one relationships that are built between the program agents and the farmers help change attitudes and behaviors so that the farmers are able to better manage the farm operation.

The Small Farm Program for socially disadvantaged and limited-resource farmers appears to significantly increase participants' net farm income, given sufficient participation. Limited contact between program agent and farmers, as measured by a single visit by a program agent, has no significant effect on income. Aggregate benefits of the program may approach $10 million per year while annual costs are in the range of a few hundred thousand dollars. Basing the benefits on the number of visits is questionable as impacts may not increase proportionally as the number of visits increases, but as a lower bound, the program is projected to provide at least $2 million in total benefits.

The findings clearly suggest a rationale for increasing the level of participation before broadening the program to include nonparticipants. Without multiple farm visits by each program agent, the impact of the Small Farm Program will be lessened—active and intense participation are what make the program work.

References

Capps, O. Jr. and R. A. Kramer. "Analysis of Food Stamp Participation Using Qualitative Choice Models." *American Journal of Agricultural Economics*. 67(1): 49-59. (1985).

Essel, A., W. Clarke, and A. Tegene. "Defining Outcomes and Measurable Indicators for 1890 Land Grant Programs." Paper presented at the ERS/USDA-1890 Workshop on Enhancing the USDA-1890 Partnership, September 1-2, 1999.

Levedahl, J. William. "How much Can Informational Outreach Programs Increase Food Stamp Program Participation?" *American Journal of Agricultural Economics*. 77(2): 343-52. (1995).

Thomas, J. K. and J. Thigpen. "A Social Exchange Explanation of Participation in the U.S. Farm Program." *Southern Rural Sociology*. 12(1):1-23. (1996)

USDA. "Definitions of Some Underserved Customers." Natural Resources Conservation Service. Found at http://www.il.nrcs.usda.gov/NRCShome/outreach/Define.html. Last accessed 19 August 2002.

US Dept. Health & Human Services. 10.443: "Eligibility Requirements," *Outreach and Assistance for Socially Disadvantaged Farmers and Ranchers*. Catalog of Fed. Domestic Assist. Found at http://aspe.os.dhhs.gov/cfda/P10443.htm. Last accessed 21 August 2002.

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