

# FACTORS INFLUENCING CONSUMER SATISFACTION WITH A COMMUNITY SUPPORTED AGRICULTURE FARM (CSA)

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## ABSTRACT

Community support agriculture (CSA) is a form of direct marketing of agricultural products that can be an important facet of a more sustainable, locally based food system. This study estimates consumer satisfaction using an ordinal probit model. Data were collected through phone interviews with members of three CSA farms in Vermont. Results indicate that experience with the CSA farm and reasons for joining impact satisfaction.

## INTRODUCTION

There is a movement in this country and around the globe to reconnect people and their food supplies. For reasons such as food security, our impact on the environment, nutrition, and the psychological and emotional importance of food in our lives, activists are trying to circumvent the industrial food system by encouraging the development of more locally based "foodsheds" (combining the concept of a watershed and a food system). Buying locally produced food items and buying directly from the farmer are ways to facilitate the creation of foodsheds. This research investigates the factors that influence consumer satisfaction with a Community Supported Agriculture (CSA) farm. This information can help farmers, consumers, and policy makers evaluate how to retain consumers' membership to a farm.

Community Supported Agriculture (CSA) is a form of direct marketing of agricultural products which connects farmers and consumers. Some of the risk of farming is distributed back onto the consumer, and in return the consumer has a chance to become more involved in the process of growing his or her food, and may feel more connected to both the food system and the natural environment. Consumers generally pay an up-front fee which allows the farmer to purchase seed, fertilizer, and equipment, and gives him or her a guaranteed salary for the season. The consumer receives a share of weekly harvest and

may be asked to help with weeding or harvesting at some point in the season (Smith, 1994). CSA results in an economic relationship which includes values other than just cheap food and profit maximization. It affords farmers a security which is not often achievable without large-scale operations, and offers consumers greater contact with the producers of their food and with the process itself. As one tool to be used in an attempt to address the negative aspects of our current food system, CSA seems to have promise.

However, anecdotal evidence from CSA farmers indicates that a significant portion of members change from year to year, indicating that many consumers of CSA fail to develop a long term relationship with their member farm (Jones, 1996). Yet, the customer satisfaction literature clearly points out that it is more cost effective to keep customers than to continually search for new ones (Cohen, 1973; Reichheld & Sasser, 1990), and that satisfied customers are more likely to repurchase a product or service (Droge & Halstead, 1991; Kolodinsky, 1993). Thus, there is a need to examine the factors that affect consumer satisfaction with CSA farm memberships in order to help farmers increase satisfaction and "staying power" of members.

## REVIEW OF LITERATURE

Most of the literature concerning Community Supported Agriculture is descriptive, anecdotal, or instructional in nature (see Demuth, 1993). Suput (1992), Laird (1995), and Kelvin (1994) conducted small sample analyses of CSAs to examine economic viability and benefits. Generally, all the findings indicate that positive benefits to consumers include high quality food, increased sense of "community," organic food, and variety. Pick-up schedules and convenience are problem areas for CSAs. Many consumers find that pick up times are limited and that an extra trip for part of a household's weekly groceries is time consuming.

Organic or low-input production methods are an important aspect of the CSA philosophy.

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Therefore, research investigating consumer attitudes and behavior relating to organic food and direct marketing gives insight into consumer attitudes toward CSA membership. During the 1980's, consumption of organic produce increased dramatically due primarily to four factors: health concerns led to a desire for a low-fat, high-fibre diet; perceived health risks were associated with consumption of food additives; a perception of danger was associated with agrochemical residues; and there was an increasing awareness of the environmental damage associated with modern agricultural techniques (Stopes, 1989).

A marketing study done in New York State (AHF, 1992), and studies by Goldman and Clancy (1991), Cook (1992) and Oelhaf (1978) found that individuals who buy organic produce are more concerned with safety and environmental impact than with appearance. Their findings also indicate that organic food consumption may have a link with environmental concerns. Stuhmiller (1976) and Cook (1992) found that direct connections between consumers and farmers lead to increased satisfaction, and note that organic food is not often found in supermarkets, perhaps due to a lack of flow of information between seller and consumer. This may explain why initial interest in organic foods at supermarkets waned quickly, yet people continue to purchase organic food from health food stores. Pelch (1996) examined factors that influence the probability of joining a CSA farm. Higher prices of membership increased CSA membership probabilities, while family structure, including presence of younger children in the household, decreased membership probabilities. Finally, more highly educated individuals had a greater probability of becoming a member.

Despite the growing literature about what prompts individuals to join a CSA farm, there is little research that examines satisfaction of CSA members. Pelch (1996) conducted a bi-variate analysis that examined factors associated with consumer satisfaction and plans to rejoin a CSA farm the next season. General dissatisfaction, lack of variety of produce, lack of availability of farm products other than produce, and dissatisfaction with pickup of produce were all associated with consumer plans not to rejoin a CSA farm. Kolodinsky and Pelch (1997) investigated the possibility that CSA farm members obtain utility

from time spent in activities associated with membership. They concluded that while picking up produce resulted in providing some satisfaction for members, time spent putting produce away at home created dissatisfaction.

## METHODOLOGY

### Conceptual Model

We develop a simple model of CSA farm satisfaction based on the assumption that there are primary, secondary, and tertiary factors that affect consumer satisfaction. We hypothesize that consumer satisfaction with CSA membership is influenced by factors that are directly related to that membership, including cost of membership, time spent in activities related to the membership, reasons for joining the farm, experience with the farm, and perceptions of the adequacy and quality of produce received. Secondary factors that may affect satisfaction with a membership include the amount of space a consumer has to store produce received each week, where they do their usual shopping for groceries, and whether or not they purchase organic produce from outlets other than the CSA farm (e.g., in winter when the farm is closed). These factors are related to food purchase and consumption, but are not directly tied to the specific activities of a CSA. Tertiary factors include the socio-demographic profile of the consumer and his or her family, and household behavior related to socially responsible behavior (e.g., recycling behaviors). These factors may influence consumer choices, and should be controlled for, but they are not directly tied to a specific food purchase or consumption. Figure I depicts this model.

The dependent variable is consumer satisfaction with a CSA farm membership. Satisfaction is an ordinal construct, regardless of the scale of measurement used. Despite the fact that the measurement of satisfaction can be conceptualized using an interval scale, differences in people's perceptions of that scale makes measurement on an interval level non-operational. In order to use a multi-variate regression type of analysis, this limitation in the measurement of the dependent variable is an important consideration. Therefore, to operationalize the model outlined in

**Figure 1**  
**Conceptual Model Outlining Factors Affecting Satisfaction with CSA Membership**

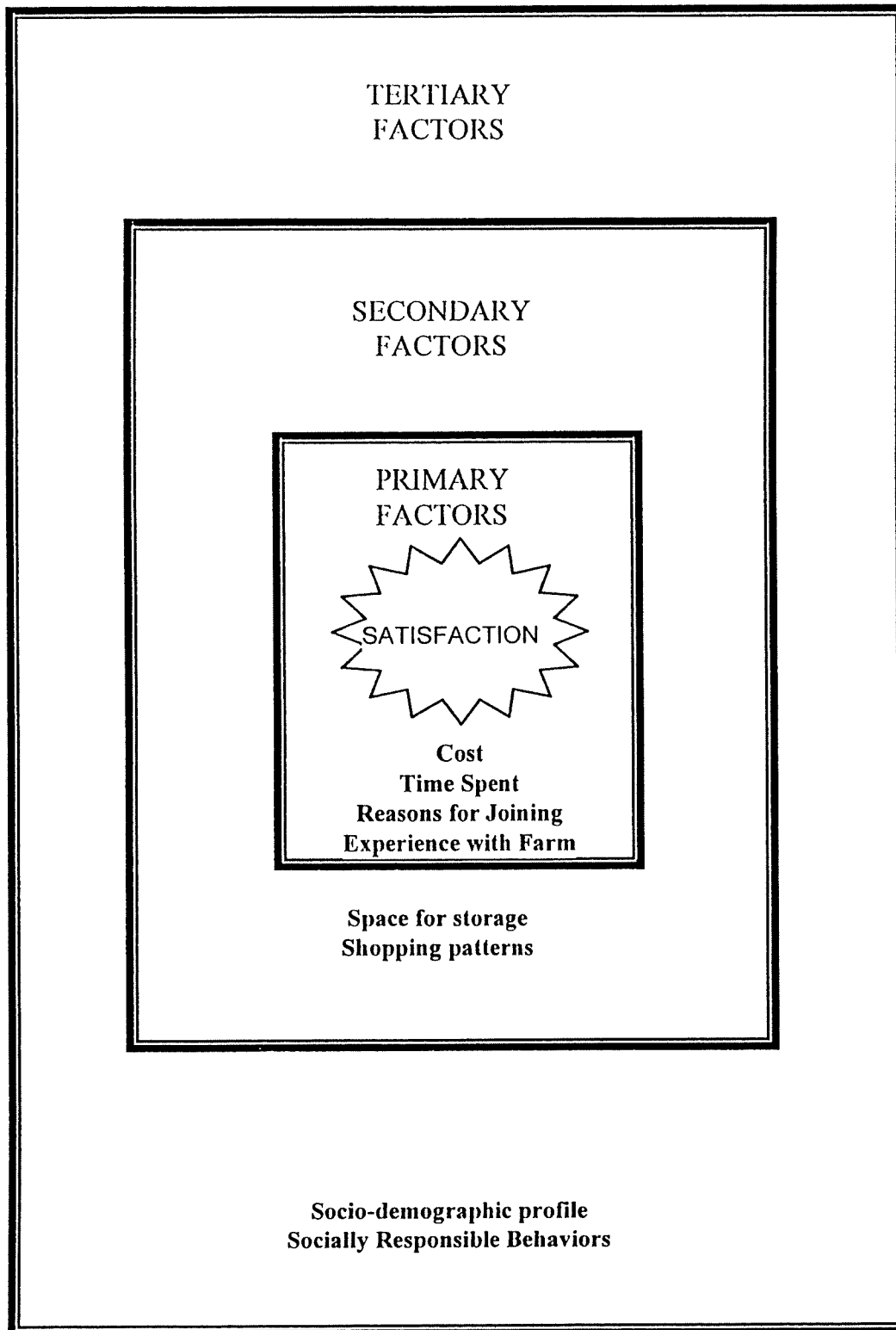


Figure 1, an ordered probit model is used (McKelvey & Zavoina, 1975; Winship & Mare, 1984). The dependent variable is a measure of overall satisfaction. Several items are hypothesized to impact overall satisfaction, including factors specifically related to the quantity and quality of produce received at the CSA.

### Data Collection and Variable Creation

Survey questions were developed with the input of the farms involved, and reference to Frey's *Survey Research by Telephone* (1989). The surveys were pretested on the members of a CSA who did not participate in the study. Input from the pretesting process was used to revise the surveys. Data were collected via phone survey during October of 1995. Members and a random sample of non-members of three CSAs in Vermont were surveyed. Member phone numbers were obtained from the farms. Data were collected using the CI2 Computer Assisted Telephone Interviewing (CATI) system (Sawtooth Software). The population of members was 277; 184 usable responses gave a response rate of 66%. Non-member phone numbers from the regions surrounding each CSA. The number of usable responses was 238, for a response rate of 30%. The farms were chosen to represent different regions, rural/urbaness, and sizes of CSAs within the state.

### Empirical Model

To operationalize the model proposed, we use ordinal probit. If the probability that the dependent variable increases slowly at low and high levels and increases more quickly at intermediate levels, the cumulative normal probability function is an appropriate representation of the underlying, unmeasurable scale for satisfaction. An ordered probit specification is preferable to the linear model because it takes into account the floor and ceiling effects of the dependent variable (Hanushek & Jackson, 1977). Because the cumulative normal transformation is non linear, we must obtain estimates for the parameters that influence satisfaction using maximum likelihood methods (Pindyck & Rubinfeld, 1991).

The technique of ordinal probit not only provides estimates of the impact of independent variables upon the dependent variable, it also provides additional parameters. The number of the additional parameters are one fewer than the number of responses coded for the ordinal dependent variable, satisfaction. They provide information as to the location on the *implied* interval scale measuring the dependent variable, but which is not made explicit when the dependent variable is measured using an ordinal scale, such as the Likert scale used to measure satisfaction in this research. The equation used to obtain an estimate of satisfaction with CSA farm membership is:

$$(2) \text{SATISFACTION} = B_0 + B_1\text{COST} + B_2\text{PICKUP} + B_3\text{PUTAWAY} + B_4\text{IMPROVE} + B_5\text{YRSMEM} + B_6\text{QTPROSAT} + B_7\text{QLPROSAT} + B_8\text{FRZSPACE} + B_9\text{CANSPLACE} + B_{10}\text{SUPERMKT} + B_{11}\text{ORGANIC} + B_{12}\text{EDUC} + B_{13}\text{LOWINC} + B_{14}\text{HIGHINC} + B_{15}\text{KID12} + B_{16}\text{RECYCLE} + \text{Error}$$

**SATISFACTION** is measured using a five point Likert scale with responses ranging from very dissatisfied to very satisfied. Note that in this study, no respondent reported being dissatisfied or very dissatisfied; only responses of neutral, satisfied and very satisfied were recorded. **COST** is a continuous variable measured by the per person cost of membership to a household as reported by respondents. Consistent with economic theory, it is hypothesized that the higher the cost of membership, the lower the satisfaction with membership. **PICKUP** and **PUTAWAY** are continuously measured variables measured as the number of minutes spent picking up a weekly share of produce at the farm and the number of minutes spent unpacking, cleaning, and putting the share away at home. **PICKUP** is hypothesized to have a positive effect on satisfaction, while **PUTAWAY** is hypothesized to have a negative effect. Pelch (1996) found that while members obtain utility or satisfaction from time spent at the farm, they obtain disutility from the work associated with putting the produce away at home. **IMPROVE** is a dummy variable that is coded as 1 if the respondent reported joining the CSA farm

for the reason of improving his/her nutrition. Its effect is hypothesized to be positive on satisfaction as the produce received from the farm is fresh and free of chemicals. **YRSMEM** is a continuously measured variable representing the number of years the respondent has been a member of the farm. If a respondent has developed a relationship with the farm over a period of years, their current satisfaction is hypothesized to be greater. **QTPROSAT** and **QLPROSAT** are dummy variables that equal 1 if the respondent agreed that the quantity of produce provided was satisfactory and the quality of produce provided was satisfactory. All of the above are considered to be the primary determinants of satisfaction with CSA farm membership. The following variables represent secondary factors that may affect satisfaction with CSA farm membership. **FRZSPACE** and **CANSPLACE** are dummy variables coded as a 1 if the respondent reported having enough storage space for the produce received from the farm. Typically, members received quantities of certain items, including summer squash and tomatoes, that require storage methods beyond refrigeration. Without adequate storage space, members are forced to throw out or give away excess produce. It is hypothesized that having adequate storage space will have a positive effect on satisfaction. **SUPERMKT** is a dummy variable coded as 1 if a respondent typically shops at a supermarket for produce rather than a neighborhood market or co-operative when the CSA farm is not in operation (7 months of the year). **ORGANIC** is a dummy variable coded as 1 if the respondent purchases organic produce in markets other than the CSA farm, either in- or out- of- season. The direction of effects on satisfaction is unknown for these variables. On the one hand, consumers who usually shop at supermarkets and purchase organic produce may find the CSA experience to be positive in comparison. However, the opposite may also be true if the quality of produce is equal and consumers consider travel costs to an additional venue. **KIDS12** is a continuously measured variable representing the number of children under the age of 12 in the household. The presence of children in a household increases household productivity. However, the effect of having children on CSA satisfaction may be negative,

since children compete for time spent in CSA related activities. **EDUC** is a continuously measured variable representing the years of education completed by the respondent. The effect of education on satisfaction cannot be predicted. **HIGHINC** and **LOWINC** are dummy variables that equal 1 if a respondent's income falls in the highest or lowest quartile of income for the state of Vermont. The sign on this variable will give an indication of whether CSA farm satisfaction is a "normal" or "inferior" good in economic terms. **RECYCLE** is a dummy variable that equals 1 if a respondent "recycles as much as they are able to" in his/her given locale. Summary statistics are presented in Table 1.

While the equation to estimate satisfaction with a CSA farm appears straightforward, there are two complications that must be accounted for. First, there is the issue of sample selection bias. Second, there is the issue that years of membership can be a function of satisfaction, and satisfaction can be a function of years of membership. To correct for the first problem, we use Heckman's (1979) sample selection bias correction procedure. While we have information on both members and non-members of a CSA for several of the independent variables, we have a measure of satisfaction only for members. In order to fully utilize the information available, we estimate the probability of belonging to a CSA farm using information on all respondents. Next we estimate satisfaction.

The second complication is one of simultaneous equation bias. To correct for this, we use a technique similar to two stage least squares. However, we use ordinal probit to estimate the satisfaction equation, and Ordinary Least Squares (OLS) to estimate years of membership. After correcting for sample selection bias, we estimate reduced forms of the equations for years of membership and satisfaction, ensuring identification of both equations and using estimates of satisfaction and years of membership from the reduced forms, we estimate the structural forms of both equations. The data were analyzed using Limdep (Greene, 1986).

## ESTIMATION RESULTS

Table 1 provides parameter estimates for the

probability of joining a CSA and structural equations for years of membership and satisfaction. Five variables are significant in predicting the probability of joining a CSA, and the significant coefficient on Lambda indicates there is sample selection bias. Having more children under age 12 and buying organic produce in the "off" season both increase the probability of joining. Higher incomes, shopping at supermarkets in the "off" season and growing more of a household's food at home all decrease the probability of joining a CSA. While these results are only an intermediate step in the estimation of satisfaction, the primary goal of this research, they are interesting in their own right. There appears to be a niche market for CSA membership. Such a target includes families with children who already purchase organic produce in "unconventional" outlets (co-coops, farm stands) and do not garden.

In the structural equation that estimates years of membership, having children under age 12, joining a CSA to improve nutrition, and cost all increase years of membership. Shopping in supermarkets in the off-season and increases in the percentage of food grown at home decrease years of membership. Being satisfied with a CSA farm does increase years of membership. Thus, keeping members satisfied is essential in ensuring a long-term relationship with customers.

In the equation of particular interest, satisfaction with a CSA farm, several primary factors and one secondary factor are found to be significant in increasing satisfaction (See Figure 1). Increasing time spent picking up produce, longer membership experience, and choosing to join the CSA farm to improve nutrition, and perceptions that the quantity of produce received is satisfactory all increased respondent satisfaction with CSA farm membership. Cost was the only insignificant primary factor. Only shopping in a supermarket in the off-season was significant and negative in this study.

The estimated variable MU is significant and identifies the locations on the underlying interval scale of the ordinal measures strongly agree to strongly disagree with overall satisfaction with CSA farm membership. This variable is translated into three categories as follows:

<u>Estimated Scale Location</u>	<u>Satisfaction Level</u>
< 0	Neutral
0-1.69	Satisfied
> 1.69	Very Satisfied

## CONCLUSIONS AND DISCUSSION

The results of this analysis indicate that CSA farmers may want to target their efforts and mold their operations in the following ways if they want to increase satisfaction of members. First, results indicate that developing a long term relationship pays off in terms of consumer satisfaction, and there is a simultaneous relationship between years of membership and satisfaction. This is news for individuals interested in sustainable agriculture, but old news for those who have studied consumer satisfaction with other products and services. Second, a focus on areas that are directly related to farm activities is important in keeping members satisfied. Although previous research has used a link between other socially responsible behaviors, including recycling and the support of the concept of community supported agriculture (AHF, 1992; Cook, 1992; Goldman & Clancy, 1991; Kelvin, 1994; Laird, 1995; Oelhaf, 1978; Suput, 1992), this study shows that satisfaction is only impacted by those factors that are central to the CSA farm experience, including time spent and nutritional quality. Thus, CSA farmers should keep their focus on offering high quality produce and communicating that message to current members. CSA farmers should also strive to get members involved. This study shows that the more time spent at pickup, the more satisfaction a consumer receives.

The findings that factors not central to the CSA farm experience have no influence on satisfaction are interesting. This is in direct contrast to research that has found that the decision to join a CSA depends on educational attainment and presence of children, with those with higher educations having an increased likelihood of joining and families with young children have a decreased likelihood (Kolodinsky & Pelch, 1997). This points to the need in future research to examine a double hurdle model in which the process of becoming a member and satisfaction are treated as one. Overall, the ordinal probit technique has promise in estimating satisfaction as

**Table 1**  
**Summary Statistics and Parameter Estimates of Satisfaction with CSA Farm Membership**

VARIABLE	DEFINITION	SUMMARY STATISTICS	PARAMETER ESTIMATES		
			JOIN CSA	YEARS	SATISFIED
CONSTANT			-.10 (.28)	-5.8 (10.72)	-.62 (960.0)
COST	Cost of CSA membership on a per person basis	83.69 (40.12)		.08*** (.01)	-.00 (.00)
PICKUP	Minutes spent picking up weekly CSA share	51.6 (27.37)			.008** (.004)
PUTAWAY	Minutes spent putting away weekly CSA share	21.61 (22.8)			.001 (.005)
IMPROVE	1=joined CSA farm to improve nutrition	.79 (.62)		1.56*** (.23)	.67*** (.25)
QTPROSAT	1=agrees that the quantity of produce provided is adequate	.93 (.24)			1.20* (.72)
QLPROSAT	1=agrees that the quality of produce provided is adequate	.99 (.07)			-.35 (.96)
FRZSPACE	1=has adequate freezer space for storage	.55 (.50)	-.04 (.13)	.17 (.18)	-.17 (.21)
CANSPLACE	1=has adequate space to store canned goods	.73 (.44)	-.17 (.15)	.21 (.21)	-.16 (.25)
ORGANIC	1=purchases organic produce from outlets other than CSA farm	.82 (.38)	.54*** (.15)	.22 (.24)	.22 (.26)
SUPERMKT	1=shops at supermarket in off-CSA season	.57 (.49)	-.72*** (.15)	-.26* (.19)	-.58** (.23)
GROWOWN	Percentage of food grown at home.	12.29 (31.4)	-.025*** (.004)	-.02*** (.006)	
KIDS12	Number of children under age 12 in household	.65 (.88)	.24*** (.07)	.18* (.10)	.05 (.14)
EDUC	Years of education of respondent	16 (2.24)	.000 (.001)	.002 (.002)	-.009 (.03)
LOWINC	1=in bottom 25% income for state.	.09 (.12)	-.09 (.23)		-.10 (.32)
HIGHINC	1=in top 25% income for state.	.24 (.30)	-.29* (.16)		-.04 (.29)
RECYCLE	1= recycles "most of what the household can"	.68 (.46)	.20 (.13)	.14 (.19)	.24 (.20)
MU					1.69*** (.59)
YRSMEM	Years belonged to CSA farm	2.09 (1.31)			.29*** (.11)
SATISFIED	Level of satisfaction with CSA farm (range 0-2)	1.63 (.48)		.31*** (.02)	
Lambda	Correction for sample selection bias		1.39*** (.07)		
N		422	422	184	184

\*\*\*Sig. at > .01 level \*\* Sig. at > .05 level \* Sig. at > .10 level; Standard errors in ( )

impacted by various independent variables since it uses the full spectrum of information available on satisfaction when measured using an ordinal scale.

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### ACKNOWLEDGMENTS

This project was supported by grants from USDA Hatch and SARE.

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