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ABSTRACT Within the conservation and production objectives that form the current Farm Bill, there are a range of options that encourage uniquely tailored farm plans for each farm and landowner (LO) situation. In this attempt to predict use of one option, the Conservation Reserve Program (CRP), three broad sets of farm structure variables were employed. These were farming scale, planning horizon, and farm specialization. A two-stage systematic sample of 437 farm parcels from county ASCS lists resulted in 187 landowner interviews for discriminant analysis. Participation in CRP was most discriminated by two farm size variables—crop acres and gross farm income. Among CRP participants, prediction of forestry versus permanent pasture options was dominated by planning horizon variables. Among non-users, lack of information was most discriminated by LOs specializing in nonruminant animal production, and farms located in the most urbanized county (Montgomery). However, the poorly informed were negatively discriminated by crop and soybean acres. While the discriminating variables were different in each analysis, about 80 percent of the cases were correctly classified in each of the three dimensions of CRP participation by the discriminant function based on the seven independent variables.

Introduction

While farmers may have fewer degrees-of-freedom to farm as they please under the 1985 and subsequent farm bills, there are still several "voluntary" options combining conservation and production objectives. Participation in the Conservation Reserve Program (CRP) rather than an alternative is therefore still likely to depend heavily upon farm and farmer characteristics. Farm owners with highly erodible crop land may or may not find it to their

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advantage to convert that land to vegetative cover for a 10-year period and rent it to the USDA.

Landowners have until 1990 to develop conservation plans that qualify for continued farm program support (Margheim, 1987). Those who have no erosion prone cropland as determined by the local Soil Conservation Service (SCS) will have no problem in qualifying. Those who do have erosion problems but enroll and comply with the CRP will continue to qualify for other program supports as well. However, others who wish to continue farming highly erodible cropland have two major alternatives. First, if the farmer is to remain eligible for price supports, a SCS approved farm plan must be developed. The plan may include some cost sharing from the Agricultural Conservation Program (ACP) to establish conservation structures. Second, the farmer may continue to farm but do nothing to reduce erosion and consequently forfeit all program benefits except as a "free rider" in the event market prices rise.

Objectives of the study

From among the above alternatives, we focused upon three aspects of interests to those concerned with implementing the CRP. First, we attempted to conceptualize and test a prediction model of participation in CRP. Second, in the interest of conservationists and the Alabama Forestry Commission, the prediction of landowners' choice of trees versus permanent pasture was attempted. Third, which should be of interest to those charged with promoting the use of farm bill programs, our efforts were directed toward prediction of landowners whose main reason for nonparticipation was lack of information about the program.

Conceptual framework

Rural sociologists concur that participation in conservation programs is predictable, but complex. Napier *et al.* (1987) identify several attitudinal, economic and social factors involved. Clearfield (1983), in summarizing previous studies of conservation practices, concludes that there are four major sets of explanatory variables: social/psychological, farm structural, ecological and institutional. Similarly, Nowak (1987), in his study of conservation technologies, specified three sets of independent variables—information factors, economic factors, and ecological factors. Pampel and Van Es (1977) posit different prediction models for profitable and unprofitable conservation technologies. It is anticipated that prediction of CRP participation may be less complex because of the economic incentives.

Unlike many soil conservation practices which take a long time to yield returns, the cost sharing benefits in establishment of conservation features and the annual rental payments under the CRP provide early returns to CRP

participants. Like most USDA farm programs and supported conservation practices, the CRP is voluntary. However, it is unique in that landowners make a bid for the annual rent they would accept to retire their erodible cropland. Logically, their bids would be calculated to provide a return comparable to other uses. If CRP is known to be paying less than a competitive return for a given piece of highly erodible land, a farmer would not bother to submit a bid on that land. In this context, it is appropriate to view adoption of CRP as if it were an enterprise rather than a conservation program. Therefore, prediction of adoption of the CRP will probably be more dependent on farm structural variables than attitudes or land stewardship concerns of the LOs. However, as Clearfield (1983) finds, adoption of conservation practices would also depend upon ecological and institutional factors like erosion proneness and use of other government programs. Thus, in this study we expanded upon farm structural variables to conceptualize a model for prediction of three dimensions of using the CRP. First, farming scale was measured by indicators of farm size, crop acres and farm income while planning horizon was measured by indicators of expected tenure and continuity of the family farm unit. Third, farm specialization was measured by acres devoted to various crops, livestock numbers, use of government programs, and proportions of cropland in selected enterprises like trees and soybeans. Two county-level ecological variables, percent of cropland estimated to be highly erodible (T2) by the Soil Conservation Service and urban development (Montgomery County), were also included as modifiers of farm specialization. For this study, it was also important that all of these variables lend to relatively reliable data collection by telephone survey.

Participation

Land owners' interest in soil conservation and their probability of adopting soil conservation practices are two different issues. Napier *et al.* (1987) found that all classes of farm-size operators tended to be interested in soil conservation programs. However, the criteria of most soil conservation programs have higher probability of being met by large farm operations. Knox and Russnogle (1987) found that benefits from CRP can accrue to both the large and small scale farmers, but they also observed large scale farmers to benefit proportionately more. A related issue is the possibility of a relationship between farm size and soil erosion. Indeed, land of small farmers may on average be more erosion prone than that of large farms. Heffernan and Green (1986) found support for the hypothesis in Missouri while Nowak (1987) in Iowa and Lee (1984) in a national study did not. Alabama and Missouri farmland may have more in common than they do with larger scale farms typical of the wheat or corn belts. No Alabama survey data was found to speak to the issue, but a Spearman Rho rank-order correlation of -.18

between average harvested crop acres per farm for 67 Alabama counties (U.S. Bureau of the Census, 1987) and percent of crop acreage computed to be highly erodible (T2 as determined by SCS) provided ecological evidence.

Many have observed (Swanson *et al.*, 1986; Danielson, 1987; Napier, 1987) that returns to soil conservation practices are low and take a long time to realize, so landowners planning horizons probably make a difference. Generally, landowners are looking for quicker returns; however, some relatively secure farmers may be looking ahead to higher long-term returns or security for future generations on the family farm. Tenure and tenure expectations as related to soil conservation practices are discussed by Ervin (1986). Research findings also suggest that crop specialization is significantly related to willingness to participate in government soil erosion control programs. For example, Napier *et al.* (1987) found specialized grain farmers to be more opposed to selling their row-cropping rights than more general farmers, and that especially dairy farmers could retire from row crop production without any loss of operating efficiency.

Conservation options

Once land is enrolled in CRP it could be planted with *trees*, wildlife plantings, water holes, or permanent pasture. While no theoretical rationale was found to suggest that farm scale and selection of tree or permanent pasture conservation options should be related, there is reason to suggest that farmers' planning horizons and farm specialization would predict the options. Landowners with extended planning horizons may be more likely to accommodate tree conservation options in their farm plans, while those with short planning horizons would be less likely to find tree options attractive because of their more permanent nature. Reconverting permanent pasture to cropland would be easier. In addition, farm specialization is expected to influence the choice of conservation options most compatible with existing farm operations (Osgood and Clearfield, 1987). As an example, dairy farmers may opt to use permanent pasture as an insurance in case of drought since a provision in the Bill allows for grazing retired land in case of emergencies or because permanent pasture could easily be reconverted to crops. Furthermore, the dairy herd retirement program encouraged dairy farmers to use pasture options. More naturally, those already planting trees would be most likely to plant more trees.

Lack of information

Availability of information has been shown to be related to adoption of conservation programs (Napier *et al.*, 1987; Nowak, 1987); however, in this study an attempt was made to gauge the relationships between the three

qualified land. Therefore, to study CRP participation rates of farmers, it was necessary to assume that sample farmers would have at least some eligible land. If each crop acre had at least a 21 percent chance, i.e., the percent highly erodible crop acres in the county with the lowest proportion, then the assumption would seem to be a fair one. Even so, this issue requires more attention below.

Based on the 437 owner addresses sampled from the ASCS lists and after extensive directory searched and assistance, 250 working and answered telephone numbers were found. Post office boxes as addresses proved to be of little use in the search. Also, nonworking numbers were frequent. Of these, 202 landowners (81% of the answered phones and 46% of the ASCS address list) were interviewed. Only 187 of these were sufficiently complete for this analysis. Of the 48 who answered but were not interviewed, 26 were refusals. While family members of the remaining 22 owners answered repeated calls and appointments for call-backs were made, the owners could not be found at home. To test for representativeness of the sample, crop acres in parcel and total acres in parcel were subjected to Duncan's multiple range test (.05 level) for the five sample response categories. None of the categories differed significantly from one another. Those for whom no phone number could be found after extensive directory searches had the fewest average crop acres (143) and the most total acres (317). Those who never answered their phones after at least three call backs had the largest average crop acreage (192), and those who declined the interview had the smallest average farm parcel (250 acres). The 202 that consented to the interview fell between the extremes on both measures with 166 crop acres and 301 farm parcel acres. These averages are nearly identical to the sample as a whole (161 and 300) and the 48 owner households who answered the phone but either refused or the owners themselves were not available (163 and 261). Thus, the respondents appear to represent the sample rather well with respect to farm size.

Direct entry of the telephone survey data was facilitated by the design of a precoded questionnaire that had been installed on SPSS Data Entry II and three microcomputers (SPSS Inc., 1987). The sampling design and questionnaire are shown in Kairumba (1988).

Stepwise discriminant analysis was used to test the conceptual framework in predicting the dichotomous dependent variables: 1) participation in CRP, 2) conservation options within CRP, and 3) lack of information about CRP as the major reason for nonparticipation. In the later case, landowners were asked an open-ended question "What is your main reason for lack of interest in the CRP?" Some were direct "lack of information" responses, others were more vague, e.g., "I have not taken the time to look into the program." One requested that the interviewer explain the program. Twenty-one such responses were coded as "lack of information." The next largest category was "not interested" followed by those who perceived eligible land to be small.

Remaining responses focused on better opportunities for eligible land. Almost all of the reasons for nonparticipation could be interpreted in terms of the small crop acreage of nonparticipants—126 versus 390 for participant farmers.

The same predictor variables were used in the three cases: first, the discrimination of participants from nonparticipants (n=35 of 187); second, among the participating landowners, discrimination of those choosing trees from those choosing permanent pasture conservation options (n=1 8 of 35); and third, among nonparticipants, prediction of landowners whose reason for nonparticipation was the lack of information about CRP (n=21 of 152).

Discriminant analysis takes variables selected by technically specified procedures and linearly combines them into one or more discriminant functions that maximize the differences between groups or categories of the dependent variables. Only dichotomous dependent variables were used in this study. Therefore a single discriminant function is the usual expectation. The standardized coefficients in the discriminant analysis are similar to the beta weights in regression analysis in that they indicate the relative importance of each predictor variable. They serve to identify the variables that contribute most to the discriminant function and ultimately to the prediction of membership in one of two groups. The square of the canonical correlation, as does r2 in regression analysis, denotes the proportion of variation in the discriminant function explained by the groups (Klecka, 1975:37). The Wilks lambda is an inverse measure of group differences over several discriminating variables. It is analogous to the proportion of unexplained variance in regression analysis. Therefore, in the special case of discriminating between two groups, the square of the canonical correlation coefficient and the value of Wilks lambda when summed are equal to one.

In this study, the main concern is not to account for explained and unexplained variance but accurate classification of cases into two discrete groups, i.e., the proportion of cases correctly classified by the discriminant function. The proportional reduction in error indicates improvement in the classification of the cases over what would be expected by random assignment (Klecka, 1980).

Findings and interpretations

In Table 1, the within group mean values of the selected predictor variables are presented for all the dimensions of CRP participation. Regarding participation and the farm scale variables, the mean values are in agreement with research expectations that participants have larger farm operations than nonparticipants: For gross farm income, 47.1 percent of the participants exceed $40,000 while only 10.2 percent of nonparticipants exceeded that value. Crop acres as another measure of scale showed the same relationship.

Table 1. Selected predictor variables by dimensions of participation in CRP

VARIABLES	PARTICIPATION		CRP OPTIONS		REASON FOR NON-PARTICIPATION	
	YES	NO	TREES	PASTURE	NO INFORMATION	OTHER
(N)	(35)	(152)	(18)	(17)	(21)	(131)
FARMING SCALE						
Crop acres‡*	390.3	126.2	581.9	174.8	51.4	138.2
Gross income >$40K	47.1	10.2	50.0	43.8	10.5	10.0
$20-40K	8.8	10.7			0.0	11.8
<$20K	44.1	77.7			88.2	76.5
Net income $0 (loss)	8.8	23.2			41.2	30.3
PLANNING HORIZON						
Future tenure						
-Intend to sell farm	5.9	13.0	0.0	12.5	0.0	15.1
-Son to inherit farm	32.3	23.2	27.8	37.5	26.3	22.7
-Owner to retain farm indefinitely	29.4	36.9	38.9	18.8	42.1	36.1
Expected tenure 5 or more yrs	47.1	31.9	38.9	56.3	31.6	31.9
Expect stable future income	41.1	51.5	50.0	31.3	47.4	51.1
Owner operator[1]	35.3	34.1	27.8	43.8	42.1	32.7
Family labor person years			1.6	1.1		
Age[2]			3.1	3.6		
Education years completed*	12.1	10.9			12.6	10.7
FARM SPECIALIZATION						
Used price support prog.	64.7	31.2	72.2	56.3	31.6	31.1
Acres in Soybean‡*	16.3	17.9	12.0	21.2	7.6	19.6
Tree acres	148.8	110.7	264	19.5	533	43.2
Corn acres*	35.3	28.3	22.2	50.0	42.1	26.1
Dairy cattle*	22.1	0.3	0.0	47.1	0.0	30.3
Beef cattle‡*	82.7	14.9				
Beef and dairy cattle*	104.9	15.				
Dairy or Beef	65.9	30.4	56.3	55.5	31.6	20.3
Nonruminants*	108	479	202	2.3	1638	134
Race—white	85.3	86.9	88.5	84.2	78.9	88.2
Farm in Montgomery Co.	8.8	7.9	5.6	12.5	15.8	6.7
Percent erodible land in county‡*	32.7	34.8	"	"	31.9	35.3

*Means of raw data; others are percentages computed from dummy variables (0, 1).
‡Variables not used in analysis.
[1]Other current tenure dummy variables not shown are 1) owner only and 2) both owner and renter.
[2]Age is coded as 1 = 0-30; 2 = 30-45; 3 = 45-60 and 4 = > 60.

Soil conservation and the CRP are long-term farm practices that are most probably adopted by farmers with long-term planning horizons and in some cases well conceived retirement plans. The data support these expectations. For example, 32.2 percent of participants will pass on their farms to their

sons or daughters in comparison to 23.2 percent for the nonparticipants. Also, 47.1 percent of the participants had an expected tenure period of 5 or more years in comparison to 31.9 percent for the nonparticipants. In contrast, only 5.9 percent of the participants had intentions of selling their land as compared to 13.0 percent for nonparticipants. The above findings suggest that where tenure conditions allowed for long-term planning, participation in CRP was more probable. Also, certain aspects of farm specialization impacted on participation. For example, 64.7 percent of the participants used the price support program in relation to 31.2 percent for nonparticipants. Participants were more often dairy/beef cattle producers as well (65.9 versus 30.5 percent).

With respect to conservation options, tree planters under the CRP did have more crop acres on average (582 acres versus 174 acres). Second, it was evident that LOs who exhibited extended planning horizons more often choose trees as their conservation measure. For example, intentions to retain their land over the next 10 years was expressed by 38.9 percent of LOs who opted for trees compared to 18.8 percent of those who choose permanent pasture. Also, future income expectations had a bearing on choice of conservation measure. A stable future income was expected by 50 percent of those who choose trees compared to 31.3 percent of those who opted for pasture. The tenure category most frequently choosing pasture was the owner-operators (43.8 percent); however, only 27.8 percent of those who choose trees were owner-operators as opposed to owner-renter or landlords. Owner-operators are generally older or near retirement and may have shorter planning horizons and therefore less interest in trees. More available family labor also appeared to influence choice of trees over pasture.

Regarding specialization, the average acreage of previous tree plantings was much greater for those who choose tree conservation options (263.8 versus 19.5 acres). This suggests that they are taking advantage of the CRP to expand their existing forest specialization. Conversely, the average proportion of cropland in soybeans is higher for LOs who choose permanent pasture over trees. Since soybean is not a program crop, these LOs may have a plan to revert to soybean farming in the future if market prices are favorable; therefore, pasture options may be more appropriate. Considering that eligible cropland was highly erodible and of similar topography, the above relationships indicate that LOs were rational in choosing options most compatible with their existing specializations.

Although Napier *et al.* (1987) found that availability of information was weakly related to participation in conservation programs, it is evident in Table 1 that there are farm structure differences between other nonparticipants and those who give lack of information as a reason for nonparticipation. Specifically the number of crop acres was smaller for LOs who lacked information about CRP (51.4 acres) than it was for nonparticipants who had

other reasons (138.2 acres). Among the planning horizon variables, intentions of selling their land was higher among LOs who gave other reasons for nonparticipation than among those who lacked information. In regards to farm specialization, the results show that nonparticipating LOs who lacked information about CRP raised more nonruminants and grew more corn than did those giving other reasons. There may be an association between corn and nonruminants, whereby corn is used as feed and it is not grown as a program or commercial crop. To the extent that these livestock farms are also smaller crop farms, they may not be alert to CRP information campaigns.

Location of the farm is also associated with availability of information. For example, Montgomery county LOs composed 15.8 percent of those that claimed lack of information as being responsible for their nonparticipation in comparison to 6.7 percent for other reasons. This may suggest that speculative land ventures and information on alternate land uses in this metropolitan county may have shaded CRP information. Finally, about 12 percent of the sample were black farmers. They were nearly equally represented in both categories of the three CRP dimensions studied.

Participation

Table 2 shows that all three structural dimensions play an important role in prediction of participation. The positive and relatively larger discriminant function coefficients (.55 and .38) for gross income and crop acres suggest that the scale of farm operation is not only significant; it is the key concept in predicting participation in CRP. Accurate data on the CRP eligibility—presence of highly erodible acres—of sample farms alter these results. Conceptually, a better predictor of participation than farm size would be the farm level measure of highly erodible acres. However, collection of this data would have required on-farm evaluation by a SCS technician.

However, farmers who are making more than the CRP rent of $45 per acre on their highly erodible land are not likely to participate. That appeared to be the case in the two sample counties (of Alabama Valley) which also had both the largest proportions and total area of highly erodible cropland, Jackson and Limestone. As of the fifth sign-up period and the time of this survey, they had the lowest proportion of eligible land signed up among the six sample counties. Lacking better data, it still seems reasonable to assume that practically all sample farms had some eligible cropland. The few that may not would marginally but unjustly add to the strength of the farm size coefficients reported above.

The planning horizon concept is represented by two variables with modest but positive coefficients—"son to inherit farm" and "expected tenure of 5 or more years." These variables show that over the next 10 years the family farm will probably be operated by the owner and/or passed on within

Table 2. Stepwise discriminant analysis for participation of Alabama landowners in the CRP

VARIABLE	STANDARDIZED COEFFICIENTS	UNSTANDARDIZED COEFFICIENTS	PARTIAL F'S
SCALE OF FARMING			
Gross income > $80,000	.55	1.56	12.33
Crop acres (ASCS)*	.38	.90	6.06
PLANNING HORIZON			
Son to inherit farm	.30	.69	3.58
Tenure up to 10 yrs	.28	.58	3.21
FARM SPECIALIZATION			
Used price support program	.28	.34	3.37
Number of dairy cattle*	.31	.81	3.83
Dairy or beef	.36	.77	3.46
(constant)		-1.23	
GROUP CENTROIDS			
Nonparticipants	-.288		
Participants	1.179		

SUMMARY STATISTICS

Canonical Correlation	0.506
Wilks Lambda	0.744
DF	7
Significance of Lambda	0.0000

CLASSIFICATION RESULTS OF DISCRIMINANT EQUATION

		PREDICTED GROUP MEMBERSHIP	
ACTUAL GROUP	NO OF CASES	NONPARTICIPANTS	PARTICIPANTS
Nonparticipants	152	128	24
Percent		84.2	15.8
Participants	35	14	21
Percent		40.0	60.0

Percent of "grouped" cases correctly classified = 79.7%
Proportional reduction in error statistic = 59.40%
*Variables are raw data; others are dummy variables (0,1)

the family. These findings are consistent with the 10-year CRP contractual period and land stewardship concerns of LOs who intend to keep farm ownership within their families.

Conceptually, some farm specializations are more compatible with CRP than are others. One modest relationship suggests that farmers who specialize in USDA program crops have a higher probability of participating in the CRP. Second, landowners who have dairy or beef cattle were also found to be more likely to participate in CRP. The latter finding is in agreement with

Napier's study (1987) which showed that dairy farmers can retire their cropland without losing their operating efficiency. Furthermore, in 1986-87, the dairy herd buy-out program encouraged temporary retirement of cropland as well, leaving the door open to return to dairy farming in the future. Also, the possibility that CRP land might be released for emergency feed in the event of severe drought would encourage active cattle farmers to participate.

The discriminant function resulting from the linear combination of those seven variables correctly classified 79.7 percent of the cases as participants or nonparticipants. Accordingly, classification error was reduced by 59.4 percent.

To test the robustness of the conceptual model, several optional methods of handling missing data were tested (Klecka, 1975); in each case the standardized coefficients and the classification results changed only a small amount or shifted emphasis from one alternative indicator of scale to another.

To further test the conceptual framework, a second discriminant analysis was done after all the significant predictor variables were removed from the original model except for crop acres (.30). Similar variables entered the model. For farm scale, gross income of less than $20,000 (-.56), gross income between $20,000 to $40,000 (-.42) and net income of less than zero (-.34) were all inversely related to participation. This suggests that limited resource landowners are less likely to participate in CRP. In relation to farm specialization, beef and/or dairy cattle (1.53) and tree acres (.29) indicate that these farmers are more likely to participate; however, those LOs with beef cattle alone (-1.27) were less likely to participate. There were no significant planning horizon variables that entered. The planning horizon variables were also the weakest set in the first analysis. This dual test of the model with alternative indicators reaffirms the robustness and the consistency of the conceptual framework in predicting participation in CRP with 80.2 percent correctly classified cases.

Conservation options among participants

Among participants (n=35), discriminant analysis was used to discriminate landowners who opted for trees alone or for trees in combination with wildlife reserves, pasture or water holes (n=1 8) or permanent pasture without trees (n=1 7). The standardized coefficients in Table 3 show that planning horizon and farm specialization but not farm scale variables play a role in prediction of trees or permanent pasture conservation options.

Planning horizon variables seem to be the most important in predicting tree planting conservation measures. The standardized coefficients in Table 3 show that there is a positive relationship between both farmer expectations of a stable future income (1.05) and farmer intentions of retaining land ownership beyond 5 years (.92) with use of trees as a conservation measure.

These variables do allow for long-term planning, and as such the relationship is in agreement with the research expectations. From the above findings it may be concluded that financially secure landowners with extended planning horizons are more likely to use trees in their conservation practices.

The standardized coefficient for owner operator status of -1.27 shows that landowners who operate only land they own were less likely to use tree options. To the extent owner operators are older and near retirement, they may have shorter planning horizons and therefore less interest in trees. Conversely, when landowners were asked, "Who will own the land 10 years from now?," the landowner's intention to retain the farm (.92) clearly contributed to discrimination of tree-planting conservation options. This finding suggests that commitment to growing trees is more likely if the landowner retains the farm himself than if it is to be operated by anyone else. Another stability related variable—the expectation of a stable future income—was a strong predictor of tree planting.

Farm specialization also plays an important role in the prediction of options selected by farmers. As expected, farmers will choose those options most compatible with their existing farm enterprise combination. Farm specialization is represented by number of tree acres with a positive standardized coefficient of .56. This shows that the more tree acres the landowner has, the more likely he/she will use trees as a conservation measure. This may indicate that landowners are taking advantage of CRP to expand their forest land at subsidized rates. Results in Table 3 also show that specialization in soybeans (-.76) discriminate farmers that were less likely to opt for tree-planting conservation measures. Given that soybean farmers are less dependent on USDA price support programs, it may indicate that they are interested in the conversion back to soybeans when and if the market prices are right, so they may find tree options less attractive.

The discriminant function based on these five variables correctly classified 83 percent of the landowners who opt for trees and those who opt for permanent pasture conservation measures. In comparison to random assignment, the function reduced the classification error by 65.7 percent.

To test for the robustness of the conceptual framework in prediction of conservation options, discriminant analysis was done without the variables in Table 3. Predictor variables were replaced by similar ones. Although there were no farm scale variables among the alternate predictors, evidence suggests that planning horizon variables were again most prominent in prediction of tree options. Expected tenure of 5 to 10 years (-.89) and age (-.32) were inversely related to tree conservation options while available family labor (.65) was positively related. This may suggest that tree conservation options are more favored by younger farmers with an extended tenure expectation and relatively more family labor. This finding reaffirms the importance of planning horizon variables and also the contributions of family

Table 3. Stepwise discriminant analysis for conservation options chosen by CRP participants.

VARIABLE	STANDARDIZED COEFFICIENTS	UNSTANDARDIZED COEFFICIENTS	PARTIAL F'S
SCALE OF FARMING			
PLANNING HORIZON			
Owner operator status	-1.27	-2.61	14.74
Owner to retain farm	.92	2.00	8.16
Expect same future income	1.05	2.11	10.53
FARM SPECIALIZATION			
Percent of crop acres in Soybean*	-0.76	2.76	6.68
Tree acres*	.56	.18	4.24
(constant)		-.365	
GROUP CENTROIDS			
Permanent pasture	-1.01		
Tree-planting	.90		

SUMMARY STATISTICS

Canonical Correlation	0.70
Wilks Lambda	0.51
DF	5
Significance of Lambda	0.0012

CLASSIFICATION RESULTS OF DISCRIMINANT EQUATION

		PREDICTED GROUP MEMBERSHIP	
ACTUAL GROUP	NO OF CASES	PASTURE	TREE PLANTING
Pasture	17	17	0
Percent	100.0	0.0	
Tree planting	18	6	12
Percent	33.3	66.7	

Percent of "grouped" cases correctly classified = 82.9%
Proportional reduction in error statistic = 65.7%
*Variables are raw data; others are dummy variables (0,1)

labor in a typically high labor requirement and slow rate of return investment like trees. With reference to farm specialization variables, LOs with corn bases (-1.18), number of dairy cattle (-.74) or located in metro Montgomery county (-.64) were inversely related to tree options. Corn and/or dairy farmers may opt for less permanent conservation measures like permanent pasture which could be used in case of drought or converted back to production more easily in the future. Speculative land ventures in Montgomery county may also hinder its use for more permanent conservation measures

like planting trees. These six variables combined to correctly classify 85.6 percent of the cases, an even higher proportion than in the original analysis.

Lack of information among nonparticipants

Table 4 shows the discriminant analysis of CRP nonparticipants who claim a lack of information as their main reason. The negative standardized coefficients for crop acres indicate that the more crop acres a landowner has, the less likely he/she will claim lack of information about CRP as his/her major reason for nonparticipation. This -.49 coefficient suggests that farmers of large crop operations have a higher probability of being well informed about CRP. This is supported by the evidence with respect to farm scale. The discriminant function combines three farm scale variables—a strong negative coefficient associated with soybean acres and two strong positive coefficients associated with production of corn and nonruminants. Landowners who raised large numbers of nonruminants such as poultry or hogs and/or corn acres more often claimed that lack of information was their main reason for nonparticipation. This may suggest that these farmers are part of a vertically integrated broiler or feeder pig operation with few crop acres and as such find no urgency in obtaining information on CRP. Similarly, since corn is not a major program crop in Alabama, this may suggest that it is grown as a local specialty, e.g., white corn for corn meal or for consumption at the farm. In any case, it appears that small corn growers are not well informed about CRP.

Table 4 also shows that landowners with short planning horizons (in relation to agriculture, as exhibited by their intentions of selling their land) were less likely to state that lack of information was their main reason for nonparticipation. Planned sale of the land would exclude a CRP option. Landowners who resided in Montgomery county were more likely to state that lack of information was their main reason for nonparticipation. Due to high real estate values and alternate land uses, the attention of these landowners may be given to nonagricultural enterprises and may therefore contribute to lack of information about CRP.

This discriminant function combining six variables correctly classified 81 percent of the cases, and when compared to random allocation the function reduced classification error by 61.8 percent. Alternate predictor variables were again used to test the consistency of the model. One farm size, one planning horizon and two farm specialization variables entered at the .01 level. They were crop acres (-.61), years of education (.68), percent of highly erodible land (T2) in county (-.60) and corn (.51). The standardized coefficients indicate that the more crop acres and the higher the proportion of erosion prone acres in the county, the less likely the landowners will claim lack of information as their main reason for nonparticipation. Further analysis

Table 4. Stepwise discriminant analysis of landowners' reasons for nonparticipation: lack of information about the CRP

VARIABLE	STANDARDIZED COEFFICIENTS	UNSTANDARDIZED COEFFICIENTS	PARTIAL F'S
SCALE OF FARMING			
Crop acres (ASCS)*	-.49	-.18	5.60
PLANNING HORIZON			
Intend to sell farm	-.45	-1.34	5.10
FARM SPECIALIZATION			
Soybean acres*	-.99	-.14	10.70
Corn acres*	1.14	.46	14.6
Number of nonruminants*	.49	.11	6.70
Farm in Montgomery Co.	.66	2.43	9.54
(Constant)		.49	
GROUP CENTROIDS			
Other Reason	-0.19		
Lack of information	1.24		

SUMMARY STATISTICS	
Canonical Correlation	0.447
Wilks Lambda	0.799
DF	6
Significance of Lambda	0.0000

CLASSIFICATION RESULTS OF DISCRIMINANT EQUATION

		PREDICTED GROUP MEMBERSHIP	
ACTUAL GROUP	NO OF CASES	OTHER REASON	LACK OF INFORMATION
Other Reason	131	114	17
Percent		87.0	13.0
Lack of information	21	12	9
Percent		57.1	42.9

Percent of "grouped" cases correctly classified = 80.9%
Proportional reduction in error statistic = 61.8%
*Variables are raw data; others are dummy variables (0,1)

of the Pearson correlation matrix indicates that Montgomery county is inversely related with the percent of the highly erodible acres variable in the original discriminant results, suggesting that information on alternative farming systems, speculation on future land ventures, or off-farm opportunities for small farmers could all overshadow the public information campaign on CRP in this urban county.

Summary and discussion

Compliance with soil conservation standards has become an integral part of crop production objectives under the 1985 Farm Bill. Farmers have several options from which to choose. Landowners with no erosion prone cropland or those who have already agreed upon and implemented SCS approved farm plans will continue to derive benefits from USDA programs. However, those with erosion prone cropland that have not done so have until 1990 to submit soil conservation plans that meet SCS standards and may include cost sharing from CRP or ACP. These plans must be implemented by 1995 if the farmer is to continue to derive ASCS program benefits. Alternatively, LOs may do nothing to reduce soil erosion and therefore forfeit USDA program benefits except as free riders in the case of price hikes.

Given the above alternatives, we focused on prediction of three dichotomous dimensions of using the CRP: One, participation in CRP; two, conservation options among participants; and three, lack of information as the main reason for nonparticipation among non-users of the program. To arrive at this objective, a conceptual model based on three broad groups of variables (farm size, planning horizon, and farm specialization) was used to predict each dimension discussed. In discriminant analysis of each dimension, these variables accurately classified about 80 percent of the cases.

Participation in CRP was most discriminated by farm scale variables, positively by crop acres and gross income. Among CRP participants, use of trees versus permanent pasture options was most discriminated by specialization and planning horizon variables. CRP tree plantings were predicted by pre-existing tree acres and expectations of extended landownership. Typically, these LOs were younger farmers with more family labor. Conversely, pasture options were most discriminated by farmers who operate only the land they own and who are typically near retirement with little or no additional family labor. The third dimension—lack of information among non-users—was most discriminated by specialization and farm scale variables, positively by nonruminant animal and/or corn production and inversely by total crop acres. The county of location, Montgomery, also predicted lack of information. While this state capital county is becoming increasingly urbanized, it is one of the least erosion prone counties, suggesting that information on alternative cropping systems or speculative land use ventures would overshadow information on CRP.

In this study, it has been particularly evident that large-scale farmers are more likely to use the program than limited-resource farmers (LRF). We have also observed that among participating LOs, use of tree conservation measures were most discriminated by those already specializing in trees, and planning horizon variables like longer expected tenure, available family labor, and stable income expectations. Although there were several reasons for

nonparticipation, those who stated "lack of information" to be the main reason were on average smaller LRF with less education and a greater dependence on the farm as indicated by a livestock enterprise.

Given these findings, it is evident that CRP objectives among LRFs may not be achieved unless specially tailored combinations of incentives and information campaigns addressing their limitations are incorporated in the program. First, LRFs should be targeted with appropriate information. Second, an income support incentive should be incorporated into CRP to provide suitable incentives for the LRFs. The choice of any option is still dependent on several factors. LRFs who are more dependent on farming may opt to use cost sharing conservation programs like the ACP that allows continued cropping of their land. Those LOs less dependent on farming may ignore farm programs all together and rent out their land or crop it whenever the prices are favorable, thus taking advantage of the program benefits as free riders. Given these conditions, success of CRP among limited resource LOs may depend on specially tailored cost effective conservation plans and incentives that will allow them to achieve required conservation standards but sustain their economic livelihood.

At least two specific issues are addressed by these data. First, regardless of the evidence that small farmers are no less interested in conservation than large farmers, the socioeconomic situation of the small farmers and/or the market incentives available to them are not conducive to their early voluntary participation in the CRP or even to their seeking out information about the program. Conceivably, success of the conservation objectives of the program may turn on attracting large numbers of small scale farmers into participation. Typically, they may be cropping proportionately more rolling erosion prone land than larger farmers and they may face greater CRP cost sharing expenses per acre. On the agency side there are also greater costs associated with numerous small farmers. Larger farmers simply have more incentives working for them. Production acreage control and CRP acreage objectives may have been easily achieved by working with the larger farmers; however, it appears that achieving the conservation objectives may require a more concerted small farmer focus.

The second issue is a more specialized issue of interest to those promoting tree planting and wildlife reserves. CRP participants who opt for tree plantings tend to be those who already have planted trees and are taking advantage of CRP to expand an enterprise in which they have already specialized and that matches their planning for the farm and available family labor. CRP participation and tree planting can probably be extended on these farms, as has already been done to a degree, by simply relaxing the erosion proneness criteria. This, however, is not a solution for the conservation objectives. Moreover, it is also not likely to appeal to the more numerous small landowners with marginal cropland that should be attracted into the

program. To do so they would need information to show that tree establishment is profitable, does not require more labor, or they would need to be shown that, pending improved markets, the land could be returned to crop acres after 10 years without excessive costs. On the other hand, this strategy will most likely favor those LOs already participating in the CRP to expand their tree acres at subsidized rates. In effect the production and erosion control objectives may be undermined because the target LOs are already left out. In agreement with Clearfield (1983) that profitability is a key factor in use of conservation programs, we suggest that the CRP should be promoted more as an enterprise than a production and erosion control program, but tailored so that it is more profitable for small farmers. That may involve income support policies.

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