Assessing the Retention Potential of Conservation Reserve Program Practices in Alabama

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ABSTRACT: ***Conservation reserve program (CRP) participants in Alabama were surveyed to determine the probable utilization of CRP acres should the contracts expire without opportunity for renewal. From over 9000 contracts established between 1986 and 1995, 594 contracts were randomly selected and surveyed for the study. Two hundred and fourteen surveys were completed and returned. Of these, 204 (34%) were usable. Results indicate that 9090 of CRP tree acres would be retained in trees while nearly 6090 of CRP grass acres would be converted to row crop production. In addition, there are no significant differences in the response between the minority and white participants with regard to the intended use of CRP acres. Therefore, for sustained mitigation of soil loss and reduction of excess production capacity, tree planting as a conservation practice choice should be advocated and encouraged. South. J. Appl. For. 23(2):83–87.***

The Conservation Reserve Program (CRP) was established under the 1985 farm bill of the Food Securities Act. The objectives of the CRP were to reduce the excess capacity in agriculture, reduce soil erosion, and boost farm income. Farmers, in exchange for rental payments and cost share, removed highly erodible and environmentally sensitive croplands from production and established a vegetative cover of trees or grass, or constructed erosion control structures, windbreaks, or shallow water for wildlife for 10 yr. In this sense, the program accomplished the multiple objectives of surplus control, income enhancement, and soil conservation. The program aimed to remove approximately 50 million ac of marginal cultivated cropland from production in the United States (Martin et al. 1988).

By the end of the first 10 yr contract period in 1995, 36.5 million ac of cropland were enrolled in the CRP nationwide (Osbom et al. 1994). In Alabama, approximately 573,191 ac were enrolled in the program. Of these, 53% were in trees, 45% were in grass covers, and the remaining 2% in other types of conservation reserve practices. Since the introduction of the CRP, total soil loss on the enrolled acres in the state has dropped by 94%, from over IO million tons/yr before the program began to about 7,000 tons/yr in 1995 (Onianwa and Wheelock 1996). Nationwide, CRP reduced soil erosion by nearly 700 million tons/yr, or an average of 19 tons/ac/yr (Heimlich and Osborn 1993).

Farmers' participation behavior and involvement in conservation programs have been extensively studied. Chambers and Foster (1983), Kairumba and Wheelock (1990), and Kalaitzandonakes and Monson (1994) are a few of the numerous works in the literature. Recently, McLean-Meyinsse et al. (1994) examined small farmers' involvement in the CRP. However, to the best of our knowledge, no study has examined the differences in conservation behavior between white and minority participants. This study, which uses Alabama data, addresses this research void.

The primary objective of this study was to examine the postcontract intentions of CRP participants in Alabama. Specifically, the study sought to understand the participants' intended postcontract utilization of CRP tree and grass acres, and the cultural differences in postcontract behavior between minority and white participants regarding tree and grass acres. According to Kurtz et al. (1980), the success and effectiveness of cost-share programs such as the CRP can be measured by the retention and management of the established conservation practices after the initial investments. Consequently, an examination of postcontract intentions of CRP participants will reveal the potential future use of CRP acres in the state. Information generated will be useful in formulat-

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ing necessary strategies for sustained benefit from the CRP program. The first section reviews the relevant literature on retention, followed by the description of the survey and data collection. The next section presents the results and discussions, beginning with the discussion of the characteristics of the population, the sample, and the returned survey. Then, a discussion of the conservation practices established on CRP acres and the potential future use of CRP acres are presented.

Review of Previous Retention Studies

Previous studies of soil conservation and practice retention have indicated high retention rates for tree plantings. A number of government programs have encouraged the establishment of trees on private lands. Three programs, the Agricultural Conservation Program (ACP), the Forestry Incentives Program (FIP), and the Conservation Reserve Program of the 1956 Soil Bank Act [Soil Bank Program (SBP)] have provided various forms of financial assistance ranging from cost-sharing for tree establishment (ACP, FIP, SBP) to direct payments (SBP only) to private landowners establishing trees on their lands. The purpose of these programs ranges from promoting soil and water conservation (ACP), to diverting land from crops, reducing grain inventories (SBP), and increasing timber supplies (FIP). Like the CRP, all three government programs required the landowner to maintain their tree cover for 10 yr after establishment. Kurtz et al. (1980) and Alig et al. (1980) reported on the success of two of the government programs to retain tree cover. Kurtz et al. (1980) examined the retention of conifer plantations in Mississippi, Pennsylvania, Wisconsin, and South Carolina established in 1961 or later, under the ACP program. Retention is defined as all or some of the original tree planting planted to conifers remains in that species. Their findings indicated that 95% of the original conifer plantations examined, representing 90% of the planted acreage in the sample, were retained intact, 10 to 15 yr after establishment. Alig et al. (1980) examined the retention of tree cover established under the SBP from 1956 to 1961 in Georgia, Mississippi, and South Carolina. Their findings indicated that 86% of the original tree plantings examined had been retained. Such high retention rates are an indication of the initial success of the three programs to retaining a tree cover during the early years following establishment.

Kurtz et al. (1994) examined long-term retention of tree cover under the ACP, FIP, and the SBP. Field examination of sample tree plantings established under the three programs was conducted in 1992. Seventy-six percent of the conifer plantations sampled in Georgia, Missouri, Mississippi, South Carolina, Wisconsin, and Washington, established in 1961 or later under the ACP program, were in their original tree cover. An additional 2% had been replanted, 10% were in other tree species, and only 10% had reverted to other uses. Ninety-two percent of the tree plantations sampled in Georgia, Missouri, Mississippi, South Carolina, Wisconsin, and Washington, established in 1975 or later, were in their original tree cover. An additional 5% were reported in other woodland types, and only 3% had reverted to nonforest uses. Retention of tree plantings established under the SBP from 1956 to 1961 in Georgia and Mississippi were also examined by Kurtz et al. (1994). They reported that 80% of the land area in their sample of SBP tree plantings were still in forests; 35% in original planting, 41% replanted ,and 4% in other species. Only 6.5% had reverted to cropland or pasture use and 13% had reverted to development or urban uses. All three programs, ACP, FIP, and SBP require the landowner to maintain and protect their tree cover for 10 yr after establishment. The results of the study by Kurtz et al. (1994) indicate that the 10-yr maintenance period is sufficient to result in long-term retention of tree cover on private lands. However, the current attractive timber market condition is cause for concern regarding long-term tree retention on CRP acres.

Procedure and Data Description

A survey was conducted in 1996 to collect data on the post-contract plans of CRP participants in Alabama. The survey was designed to capture information on the potential use of CRP acres should the original contracts not be renewed. The survey was pretested by eight farmers with CRP contracts not in the study sample. The farmers were selected from four counties in Alabama: Franklin, Limestone, Jackson, and Madison counties. In addition, the survey was peer-reviewed by two scientists: their comments and suggestions were incorporated in the final version. The surveys were mailed or distributed to the sample farmers through the Farm Service Agency (FSA) office in Montgomery, Alabama, with a letter explaining the purpose of the research. Completed surveys were returned to the FSA office, then forwarded to Alabama A&M University for processing and analysis.

The more than 9,000 contracts established between 1986 and 1995 in Alabama provided the population to be sampled, based on individual contracts rather than individual participants. Participants who had enrolled during the first year of the program were excluded because their contracts had expired by the time of the survey. The contracts were stratified by race to ensure adequate representation of minority participants. Due to the small number of minority participants, 50% of the minority contracts and 5.5% of the white contracts were randomly selected for the study, resulting in 94 minority contract holders and 500 white contract holders, for a total sample of 594 contracts.

All 594 contract holders were sent a survey to fill out and return. A followup letter was sent through the FSA office to encourage participants to complete and return the survey. Subsequently, telephone calls were made to each participant to encourage them to complete and return the survey. Of the 594 mailed surveys, a total of 214 (36%) were returned. However, some of the returned surveys had missing information. The respondents whose surveys were incomplete were contacted by telephone to solicit for the missing information. These efforts resulted in 204 usable surveys, 34% of the sample. The remaining 10 surveys could not be matched with any record in the sample, and as such, were unusable.

Results and Discussion

Comparison of the Acres for the Population, the Sample, and the Returned Survey

To assess the representativeness of the sample used in this study, total acres for the population, the sample, and the returned survey were compared (Table 1). On average, Alabama CRP participants have 5 1.9 ac, while the study sample and the survey respondents have 49.3 and 41.3 ac, respectively. The smaller size of average acres for the study sample and the respondents was due to the high number of minorities represented in these groups relative to the population. While white farmers were sampled at 5.5%, minority farmers were sampled at 50%. Also the lower average acreage for the returned survey was an indication of higher response rate by small farmers compared to large farmers in the sample. The largest CRP contract acreage in the state was 1,250.8 ac, while the largest contract acreage enrolled for the sampled group was 587.7 ac. For the respondents, the maximum contract acreage enrolled was 496.5 ac. Classification by race revealed that for the population, white farmers generally have larger contract acreage per person in the CRP program. The largest contract acreage enrolled by white farmers had 1,250.8 ac, while the largest contract acreage enrolled by minority farmers had only 368.5 ac. For the sample population, the maximum contract holder among whites had 587.7 ac, while the maximum contract holder by the minorities had 368.5 ac. However, for the returned surveys, the largest contract holder among whites had 496.5 ac, while the largest contract holder among minority farmers had 76 ac. Out of the 205 returned surveys, one contract with 9.4 ac could not be classified into either a minority or white group because it belonged to a church organization.

Conservation Practices Established on CRP Acres

Although minorities were oversampled by a factor of 9.16 minority to 1 white (0.5/0.0546; see Table 1), they responded at a lesser rate than the white participants (29.8% versus 35%). Statewide, there were 0.149 (28/188) minority respondents per minority contract holder and only 0.0191 (17519158) white respondents for each white contract holder. Dividing the minority response ratio by the white response ratio shows that minority farmers were overrepresented among the returned surveys by a factor of 7.8. The reciprocal, 0.128, was used to adjust the minority farmers' proportion of the total acreage. Osborn et al. (1994) noted the importance of weighting the contract-holder responses by the number of acres in the contracts, as not doing so would misrepresent the actual acreage effects of future plans and policy. Although a t-test of differences between the sample mean (49.3) and the population mean (5 1.9) was significant at the 1% level, a regression analysis examining the size effect of CRP acreage on responses (1) and nonresponses (0) indicated that less than 1% of the variance was discriminated by the differences in CRP acres. As a result, the CRP acreage effect was considered to be minimal.

Participants were asked to reveal what types of practices they currently used on theircontract acres. Almost all the acres enrolled in CRP by the respondents were covered in either trees or grasses (Table 2). Approximately 57% and 42% of sample CRP acres in Alabama were in trees and grass cover, respectively. The remaining less than 1% were in other or unspecified types of conservation management practices. These results are consistent with the findings of Onianwa and Wheelock (1996) using county-level data. Information in Table 2 suggests a higher establishment of tree practices on CRP acres for both minority and white participants. The minority respondents, with 6.3% of the total acres, had 69.7% of their CRP acres covered in trees, 29.4% in grass, and the remaining 1. 1% in other types of covers. Similarly, the white respondents, with over 90% of the CRP acres, had 57% of their acres in tree cover, 43% in grass cover, and the remaining 2% in other types of covers:

Potential Use of CRP Grass Acres

In discussing the participants' intended uses of CRP acres, a distinction was made between grass and tree acres because of the emphasis on the established practices. Also, the analyses were limited to tree and grass practices since more than 98% of the CRP acres in the state were covered in these two practices. The sample respondents were asked about their intentions should CRP contracts expire without opportunity or preference for renewal. Based on the 71 valid cases for grass acres, the responses to future disposition of grass acreage indicate that 40.6% of all CRP grass acres would be

Table 1. Comparison of population, study sample, and usable survey acres for Alabama CRP contract holders.

Group	Categories	Total	Mean	Maximum	Minimum	Contracts (no.)
		(ac)				
Population	Total	485,053.7	51.9	1,250.8	0.3	9,346
	Minority	5,236.9	27.9	368.5	1.3	188
	White	479,816.8	52.4	1,250.8	0.3	9,158
Sample	Total	29,256.7	49.3	587.7	1.2	594
	Minority	2,758.7	29.4	368.5	1.3	94
	White	26,498.0	53.0	587.7	1.2	500
Usable survey	Total	8,431.5	41.3	496.5	0.6	204
	Minority	529.0,	18.9	76.0	I.3	28
	White	7,893: I	45.2	496.5	0.6	175
	Church	9.4	—	—	—	I

Table 2. Acres in various conservation practices for Alabama CRP survey respondents.

Conservation practice	Total* (ac)	Total* (%)	Minority owned (ac)	Minority owned (%)	White owned (ac)	White owned (%)
Treeplanting	4,077.4	51.2	305.3	58.0	4,037.7	51.3
Introduced grass	2,339.3	29.4	132.1	25.0	2,322.1	29.5
Grassalreadyestablished	661.7	8.3	23.2	4.4	658.7	8.4
Treesalreadyestablished	445.4	5.6	62.1	II.7	431.3	5.6
Native grass	370.9	4.7	—	—	370.9	4.7
Erosion control structures	29.3	0.4	6.0	1.1	28.5	0.4
Permanentwildlifehab.	30.7	0.4	—	—	30.7	0.4
Other	9.5	0.1	—	—	9.5	0.1
Grass waterways	0.6	†	—	—	0.6	†
Shallow water for wildlife	—	—	0.3	†	—	—
Total	7,964.8		529		7,896	

• Minority responses adjusted by 0.128.
† Less than 0.1% of total acres.

returned to row crop production after contract expiration (Table 3). A further 24% would remain in hay or kept for grazing, 19.3% would be rented or leased, and 7.2% would be left under existing cover. Although 5.6% would be left for recreation or wildlife, only 1.3% would be converted to tree cover. If the acres intended for renting and other uses were considered, approximately 60% of the CRP grass acres would revert back to row crop production. An examination of the responses by race revealed that 68.9% of minority-owned CRP grass acres would be used for grazing or hay production, 19.7% would remain in existing cover, and 11.4% would be used for row crop production. Conversely, 40.8% of the white-owned CRP grass acres would be used for row crop production, 23.7% would be used for grazing or hay production, and 7.1% would be left in existing cover. Another 19.4% would be rented or leased, 5.7% would be used for wildlife or recreational purpose, 1.4 and 1.3% for unspecified uses and tree production, respectively. A t-test of the difference between the mean of the average grass acre retention ratio for minority (0.75) and white-owned contracts (0.55) revealed there are no significant differences at the 5% level.

Potential Use of CRP Tree Acres

From the 134 valid cases, under the same conditions as described in the previous section, the future disposition of CRP tree acres under contract would not markedly change from the current uses. Nearly 90% of the acres enrolled would remain in tree cover (Table 4). Specifically, 62.4% of the CRP tree acres would remain in trees for commercial purposes, 17.1% for wildlife or recreational purposes, and 9.2% would remain in trees for no specific purpose. Only 6.6% of the CRP tree acres would be converted to row crop production, while another 3.6% would be rented or leased.

All CRP minority tree acres from the sample would remain in tree production. Specifically, 85% would remain for commercial purposes, 9% for wildlife habitat, and the other 6.4% for trees with no specific use. White participants, in contrast, would retain approximately 89% of CRP tree acres in trees, 62% for commercial purposes, 17% for wildlife habitat, and the remaining 9% for no specific uses. Only 6.7% of the white-owned CRP tree acres would be converted to row crop production, while 3.7% would be rented or leased. Again, a t-test of the

Table 3. Potential use of Alabama CRP grass acres in the absence of program.

Uses	Total grass (ac)	Total grass (%)	Minority owned (ac)	Minority owned (%)	White owned (ac)	White owned (%)
Row crops	1,260.2	40.6	18.4	11.4	1,257.9	40.8
Remain for hay or grazing-	144.8	24.0	111.3	68.9	730.6	23.7
Rent or lease	598.6	19.3	—	—	598.6	19.4
Remain in existing cover	224.2	7.2	31.9	19.7	220.1	7.1
Wildlife/recreation	175.5	5.6	—	—	175.5	5.7
Other uses	42.8	1.4	—	—	42.8	1.4
Convert to trees	41.3	1.3	—	—	41.3	1.3
Residential/commercial	10.6	0.3	—	—	10.6	0.3
Sell land	8.5	0.3	—	—	8.5	0.3
Idle for set-aside	—	—	—	—	—	—
Total grass acres	3,106.5*	100.0	161.6	100.0	3,085.9	100.0
No. of participants	71.0		8.0		63.0	

* Adjusted for minority respondents by 0.128.

Table 4. Potential use of Alabama CRP tree acres in the absence of program.

	Total tree		Minority owned		White owned	
Use	(ac)	(%)	(ac)	(%)	(ac)	(%)
Remain in trees for commercial	2,721.8	62.4	310.5	84.5	2,682.0	62.2
Remain in trees/wildlife habitat	746. 1	17.1	33.3	9.1	741.9	17.2
Remain in trees (no specific use)	403.2	9.2	23.6	6.4	400.2	9.3
Row crops	288.1	6.6	—	—	288.1	6.7
Rent/lease	158.7	3.6	—	—	158.7	3.7
Sell land	25.4	0.6	—	—	25.4	0.6
Convert to pasture	17.7	0.4	—	—	17.7	0.4
Other uses	1.0	*	—	—	1.0	*
Idle/set-aside	—	—	—	—	—	—
Residential/commercial	—	—	—	—	—	—
Total	4,362.0†	100	367.4	100.0	4,3 15.0	100.0
No. of participants	134		20		114	

* Less than 0.1% of total acres.
† Adjusted for minority respondents by 0.128.

differences between the mean of the average tree acre retention ratio for minority (1) and white-owned contracts (0.94) was not significant at the 5% level.

Summary and Conclusion

The main objective of the Conservation Reserve Program was to retire or convert highly erodible or environmentally sensitive cropland to less intensive uses. In return for rental payments, participants were to establish a vegetative cover of grass or trees, or establish erosion control structures, windbreaks, or shallow water for wildlife use. The goals were to reduce soil erosion, improve water quality, enhance wildlife habitat, reduce excess capacity in agricultural production and boost farm income. The findings from this report suggest that if CRP contracts were to expire without opportunity for renewal, a large percentage, 60%. of the state's CRP grass acres would revert back to row crop production, thus impeding the conservation benefits derived from the program. Conversely, a large proportion, 90%, of the state's CRP tree acres would remain in tree practices and continue to provide environment and conservation benefits. The high intended retention rate for tree practices indicated by the participants is consistent with previous studies of tree planting programs (Alig et al. 1980, and Kurtzet al. 1980). Further, long-term prospects for continued conservation benefits from tree plantings are encouraging based on results of Kurtz et al. (1994) analysis of long-term retention of three similar government programs involving tree planting. Also, for both minority and white participants, almost all the CRP acres currently in tree cover would be retained in trees. There are no significant differences in the mean average retention ratios of tree and grass acres for both minority and white-owned contracts.

Skaggs et al. (1994) noted that ex ante predictions of post-CRP land use should be based on information provided by program participants because they have the best knowledge of their own circumstances and intentions. These intentions can differ from actual future behavior when the contracts expire. However, the findings from this study are consistent with observed behavior reported in previous findings regarding other programs. These results have wide implications for the southern United States. From a policy perspective, the results show that if long-term mitigation of soil loss and excess productioncapacity in agriculture were the goals, then tree planting rather than grass planting should be advocated and encouraged.

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