EFFECTS OF ALTERNATIVE ACREAGE RESTRICTION PROVISIONS ON ALABAMA COTTON FARMS

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Abstract

The 1985 Farm Bill departs from recent farm bills in moving toward more restrictive acreage control. The change from a two- to a five-year average in calculating base acreage and enforcement of limited cross-compliance appear to significantly alter crop mix decisions on representative Alabama cotton farms.

Key words: farm programs, base acreage, limited cross-compliance.

Unlike the farm programs of the 1970s which allowed price signals to be the primary determinant of acreage, even for farm program crops, the 1981 and 1985 Farm Bills limited farm program crop acreage to a portion of an historical average. Although the 1985 Farm Bill does not represent a radical departure from the 1981 Farm Bill, the 1985 bill is more restrictive than the 1981 bill. Under the 1981 Farm Bill, a two-year average was used to calculate the program base. The two-year average base, although reducing flexibility relative to the previous program, was not entirely rigid. To expand base acreage under the 1981 Farm Bill, the producer had only to forego one or two years of the economically attractive farm program benefits. Under the 1985 Farm Bill, however, base acreage calculation uses a five-year average. This makes it significantly more difficult for producers to expand base acreage and modify planting patterns.

The limited cross-compliance provision of the 1985 Farm Bill further limits producers' abilities to change crop mix. Under limited cross-compliance, a producer who opts to participate in the government program for any one crop may not plant more than the base acreage of any other program crop, even if there is no program participation for the second crop.

The intent of Congress in adapting these provisions is somewhat difficult to ascertain. One objective of limited cross-compliance may have been to eliminate the creation of "phantom acres," acres which are designated for conservation use in compliance with program provisions for one crop and then planted in another program crop, such as sorghum. Limited cross-compliance could also be important in cases where an anticipated large supply of one commodity results in a high-acreage reduction requirement. In such a case, a producer might be tempted to elect for nonparticipation in that commodity and plant beyond the base, thus exacerbating the existing supply problem. Limited cross-compliance, however, provides a disincentive, particularly if program provisions for other commodities are favorable. The five-year base provision may also have been designed to stabilize supply.

The objective of this study is to analyze how the change in base acreage calculation and the enforcement of limited cross-compliance affect producers' farm program participation, crop mix decisions, and income under the hypothesis of profit maximization. To accomplish this objective, five-year mixed-integer programming models of representative Alabama cotton farms were developed. The effects of these farm program provisions were tested for the representative farms.

Cotton was selected as the commodity of interest for two reasons. First, cotton has long been an important farm program commodity in most southern states, and, in Alabama, cotton typically ranks first among major row crops in terms of cash receipts to producers (Alabama Agricultural Statistical Service). Secondly, farm program provisions historically have had important effects on cotton acreage (Duffy and Knutson).

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REVIEW OF LITERATURE

Although Heady recognized as early as 1948 that government program provisions influence crop mix decisions, it was not until 1972 that Scott and Baker included government program provisions in a quadratic programming model of a central Illinois cash grain farm. In the 1970s, farm program participation resulted in lower expected profits than nonparticipation. Their analysis, therefore, examined the risk-income trade-off of participation and nonparticipation. Several subsequent studies (Persaud and Mapp; Kramer and Pope; Musser and Stamoulis) also analyzed the risk-income trade-off for participation and nonparticipation.

More recently, participation in the farm program has been designed to increase expected income as well as to reduce risk. In most years, the only benefit from not participating in the farm program would be the opportunity to change planting patterns and increase the base of a profitable crop for increased future program benefits.

Perry used quadratic programming to analyze the participation/crop-mix decision for Texas crop farms and found that under the 1981 Farm Bill farmers were willing to exit the program for one or two years to adjust planting patterns. The greater the assumed degree of risk aversion, the greater the likelihood of participation in the farm program. With a five-year base, participation occurred every year and no adjustments took place.

METHODS

Two representative Alabama farms were created using 1985 and 1986 records from the Alabama Farm Analysis Association and 1986 budgets from the Alabama Cooperative Extension Service. Although the representative farms are diversified crop and livestock farms, the primary commodity, as defined by the producers, is cotton. Although cotton is the primary commodity of interest in this analysis, it is important to consider cross-commodity impacts of the program. In Alabama, most cotton farms include alternative enterprises, and the interaction of farm program provisions for cotton and other commodities can be an important determinant of cotton acreage. Because the wheat, cotton, and corn programs are similar in design, analysis of the cotton program in a multi-crop setting is important.

One representative farm was developed for the central region of Alabama and another for the northwest region. Central and northwest Alabama are the major cotton-producing areas of the state, together accounting for more than 70 percent of Alabama's cotton production (Alabama Crop and Livestock Reporting Service). However, the two regions of Alabama are dissimilar in soil type, topology, and climate, justifying consideration of each region separately.

Based on Alabama Farm Analysis Association records, the central farm was assumed to have 913 acres suitable for row crops and 186 acres suitable for a cow-calf operation, and the farmer was assumed to begin with a 474-acre base in cotton, a 36-acre base in wheat, and a 54-acre base in corn. Also based on Alabama Farm Analysis Association records, the northwest farm was assumed to have 948 acres suitable for row-crops and 56 acres suitable for a cow-calf operation. The farmer was assumed to begin with a 492-acre cotton base, a 38-acre wheat base, and a 56-acre corn base. Although these farms are well above the median for Alabama in acreage, they are representative of the commercial size farms in the state.

In Table 1, some further assumptions concerning expected prices and yields for the crop and livestock enterprises are presented. Prices and yields are the actual 1986 prices and yields taken from the Alabama Farm Analysis Association records.

Five-year mixed-integer programming models of the two farms were developed. (For a discussion of integer programming, see McMillan.) A five-year planning horizon, rather than a longer one, was selected for this study because of considerable uncertainty about the long-run direction of farm programs. When the current farm bill expires, there is no guarantee that base acreage will still be relevent. A longer planning horizon, with an assumed continuation of the base acreage provisions of the current Farm Bill, would probably provide increased incentives to expand the bases of the more profitable crops.

The models include detailed representation of farm program provisions. The target price/deficiency payment program provides direct payments to producers. The total deficiency payment is found by multiplying the per-unit deficiency payment by proven yield and eligible acreage. In this study, proven yield was assumed equal to actual yield. Although in any given year proven yield may vary considerably from actual yield, their average values would be approximately equal if yields were not trending sharply upwards or downwards. (See Stucker and Collins for details of the farm program.)

Plantings of farm program commodities are limited by base acreage and any required acreage reduction. Although a payment limitation provision can be enforced in the model, it was not included in this analysis because farmers can use legal organization to evade the payment limitation provision (U.S. General Accounting Office).

Integer variables were used to provide mutual exclusivity of participation and nonparticipation in the farm program for each eligible crop. Participation vs. nonparticipation for each crop in each year required a separate pair of 0-1 integers. The sum of each pair was constrained to equal one. Thus, only one of each set of integers could enter the solution.

In our study, the assumed objective of the producers was profit maximization. Thus, the producers were assumed to be risk neutral, and participation vs. nonparticipation in the farm program was evaluated solely in terms of expected profits.[1] A risk-averse producer would probably be less likely than a risk-neutral producer to stay out of the farm program for one or more years in the hope of increasing future profits.

A small portion of the central farm model is presented in Figure 1. In this example, there is a five-year base and no cross-compliance, limited or otherwise. The integer variables X-3 and Y-3 represent nonparticipation and participation, respectively, in year 3.

The FAL row prohibits planting outside the program if X-3 is not selected, and PAL prohibits program acreage if Y-3 is not selected. If X-3 is selected, its coefficient is sufficiently large that FAL is nonbinding and other constraints in the model (land, labor, etc.) will limit nonprogram cotton acreage (AFC). If Y-3 is selected, BASEL-3 limits program acreage (APC) to the base (BASE-3). The rows ARP and PLIM divide program acreage into planted acreage (PLAC) and mandatory idled acreage (ACRP). In this example, 25 percent of the base must be idled.

Cotton base in year 4 is calculated in the TBASE-4 row. It is the average of program and nonprogram acreage (APC and AFC) for five years, years 1, 2, and 3 of the model plus a presumed average from the years before the model begins. In this analysis, it was assumed that planted and considered planted acreage for each year prior to the first year of the analysis was equal to the beginning base. In the present example, not all of the TBASE-4 row is presented due to space limitations.

The row TFCOT transfers program and nonprogram acreage alike to total yield for calculating market receipts. TPCOT transfers proven yield from the program acres for calculating deficiency payments. An initial deficiency payment on all production is calculated in row DEFPAY. (There is a $.2715 per-pound cotton deficiency payment in the example.) This deficiency payment is then divided into DPAYK, which the farm operator keeps, and DPAYX, which is excess beyond the payment limitation. In this example, there is a $50,000 payment limit in effect. To nullify the payment limit (as has been done in the application), the right-hand side of PAYLIM can be increased until it is not binding.

Other features of the model, not presented in Figure 1, are quarterly cash flow transfers, graduated income taxes, and family living expenditure as a function of income. In the model, each year's financial activities are represented in four accounting periods. Variable costs are charged to the period in which they are incurred. Borrowing is allowed at a quarterly rate of three percent, and excess cash can be invested at two percent quarterly.

Production costs used in the model are from 1986 Alabama Cooperative Extension Service enterprise budgets for the central and northwest regions. For the central farm, fixed costs are assumed to be $94,852 per year based on 1986 Alabama Farm Analysis Association records. Of the fixed costs, interest charged to fixed assets equals $44,865. Annual depreciation for machinery and buildings is $35,290. For the northwest farm, fixed costs equal $115,487 per year of which $58,922 is for interest and $27,875 is for depreciation. Depreciation is calculated using the straight-line method to avoid large year-to-year changes in fixed costs. Fixed costs are charged on an annual basis at the end of each year.

Progressive federal and state income taxes are calculated at the end of each year (Vandeputte and Baker). Marginal tax rates are from actual 1985 state and federal income

[1]Empirical evidence indicates that while the hypothesis of risk aversion is valid for some producers, it is not valid for all (Lin et al.; Knowles; Wilson). Thus, the choice of objective function, strict profit maximization vs. a modification to account for risk, depends on the objective of the study. In this study, we wish to determine, among other things, how changes in the farm program affect the producers' ability to generate income, hence profit maximization was used.

Rows	X-3	Y-3	AFC	APC	DPAYK	DPAYT	DPAYX	PCOT	PLAC	ACRP	SLCT	BASE3	BASE4		LEVEL
PROG	1	1												≤	1
BASEL-3				1								-1		≤	0
PLIM				.75					-1					=	0
FAL	-1000		1											≤	0
PAL		-1000		1										≤	0
ARP				.25						-1				=	0
DEFPAY						1		-.2715						=	0
TPAYLM					-1	1	-1							=	0
PAYLIM					1									≤	50,000
TBASE-4			-.2	-.2								1		=	190
TBASE-5			-.2	-.2										=	94.8
TFCOT			-552						-552		1			≤	0
TPCOT								1	-552					≤	0
INTRAN			307.99		-1				307.99		-.5225			=	0

Rows

ARP-i	Cotton Acreage Reduction Requirement Row For The Ith Year
BASEL-i	Cotton Base Limit Transfer Row For The Ith Year
DEFPAY-i	Cotton Deficiency Payment For The Ith Year
FAL-i	Cotton Nonprogram Acreage Limit For The Ith Year
INTRAN-i	Income Transfer Row For The Ith Year
PAL-i	Cotton Program Acreage Limit For The Ith Year
PAYLIM-i	Payment Limitation For All Program Crops For The Ith Year
PLIM-i	Cotton Planted Acreage Limit For The Ith Year
PROG-i	Program Row For Cotton For The Ith Year
PTAXT-i	Tax Paying Accounting Row For The Ith Year
TBASE-i	Cotton Base Transfer Row For The Ith Year
TFCOT-i	Nonprogram Cotton (Free Market) Transfer Row For The Ith Year
TPAYLM-i	Cotton Payment Limitation Transfer Row For The Ith Year
TPCOT-i	Program Cotton Transfer Row For The Ith Year

Variables

ACRP-i	Cotton Acreage Reduction Requirement Accounting Activity For The Ith Year
AFC-i	Nonprogram (Or Free Market) Cotton Acreage For The Ith Year
APC-i	Program Cotton Acreage For The Ith Year
BASE-i+1	Cotton Base For The Next Year
DPAYK-i	Cotton Deficiency Payment That The Operator Keeps
DPAYT-i	Cotton Deficiency Payment Transfer Activity For The Ith Year
DPAYX-i	Cotton Deficiency Payment In Excess Of The Limitation For The Ith Year
DUMC-i	Dummy Consumption For The Ith Year
PCOT-i	Program Cotton For The Ith Year
PLAC-i	Planted Program Cotton Acreage For The Ith Year
SLCT-i	Cotton Selling Activity For The Ith Year
X-i	0-1 Integer For Nonprogram Cotton For The Ith Year
Y-i	0-1 Integer For Program Cotton For The Ith Year

Figure 1. Representative Farm Model Matrix of Cotton Government Program Provisions, Central Alabama.

tax tables. The operator is assumed to be married, filing a joint return, with two other dependents.[2]

Farm family consumption expenditures are calculated each year as a portion of after-tax income. A minimum consumption of $10,000 is specified, and a marginal propensity to consume of .43 (Richardson and Nixon) is used for income above this amount. If there is insufficient income for the minimum consumption, cash may be withdrawn from savings or borrowed.

The operator is assumed to work full time on the farm. Based on Alabama Farm Analysis Association records, the central farm is assumed to have additional unpaid family labor equivalent to a one-third-time person, and the northwest farm is assumed to have an additional three-fourths-time person. Labor requirements are specified on a quarterly basis. Additional labor may be hired at $4.50 per hour. All employment contracts, whether full- or part-time, must run for an entire year.

The objective function is maximization of total cash (including investment balances) at the end of the fifth year. Taxes and family consumption are deducted in each year, but opportunity costs of operator time are not included. Because acreage and machinery values remain fixed throughout the planning horizon, the objective function is equivalent to maximizing after-tax ending net worth.

RESULTS

Several policy alternatives were evaluated. The first case uses the assumptions presented in Table 1, a two-year base and no cross-compliance. This represents a "flexible" alternative to the current farm program provisions concerning acreages of program crops. Target prices, market prices, and production costs are held constant in every year of the planning horizon. In reality, these factors would fluctuate over time. At the beginning of the planning horizon, however, future values of these variables are unknown. Results in this analysis thus represent the first year of a five-year plan that the farmer would begin in the first year of the planning horizon. In subsequent years, new information, particularly changes in expected prices or yield, might cause the farmer to modify the plan.

The second case is identical to the first except that the base acreage is changed from a two- to a five-year average. This case is similar to current farm programs except that limited cross-compliance is not enforced. In this case, the effect of moving from a two- to a five-year base is isolated.

The third case uses a two-year base and limited cross-compliance. The purpose of this trial is to analyze how limited cross-compliance alone would have affected planting patterns without the complication of the five-year base. Comparison of the results from the second and third cases should provide an indication of which provision is most limiting. Finally, both the five-year base and limited cross-compliance are added.[3]

Results of these analyses are presented in Table 2 for the central farm and Table 3 for the northwest farm. The results indicate that both the five-year base and the limited cross-compliance provisions have important effects on the farm plan.

Even under the most flexible alternative (a two-year base and no limited cross-compliance), the central farm is not a profitable venture. Net worth decreases by more than $240,000 over the five-year horizon. In this analysis, the producer plants as much program cotton as allowed in each year (474 acres). By not participating in the wheat program for the first two years, the producer expands the wheat base to 439 acres by year three. Then, in years three through five, there is program participation for wheat.[4]

For the five-year base with no cross-compliance on the central farm, the planting decisions in years one and two are identical to the previous case. In years three through five, however, wheat acreage is reduced because the five-year base calculation results in a smaller base. Losses increase to $267,681. The switch from a two-year to a five-year base thus "costs" this producer $26,945.

For the two-year base with limited cross-compliance for the central farm, results are dramatically different than for either of the previous cases. Because limited cross-

[2]Changes in the tax laws, occurring after model development, resulted in a different rate structure. Sensitivity analysis indicated that major decision variables were unaffected by tax rates; hence, the 1985 rates were not changed. As farm growth is not an alternative in the model, tax considerations are not of great importance here.

[3]In the 1985 Farm Bill, base is the lowest of a two-year or a five-year average. In this paper, we opted to isolate the effects of a pure five-year base. In developing the next farm bill, policy makers may very well consider this option as the five-year base will, by then, have been in effect long enough so that there would be no unanticipated base gains from such a policy.

[4]Rotational restrictions are not used in the model because many Alabama farms are not following a rotational system (Touchton et al.).

TABLE 1. SUMMARY OF PRICES, LOAN RATES, TARGET PRICES, ACREAGE REDUCTION REQUIREMENTS, YIELDS, AND BASE ACREAGE FOR THE CENTRAL AND NORTHWEST ALABAMA COTTON FARMS, ALABAMA FARM ANALYSIS ASSOCIATION, 1985 AND 1986

Farm and enterprise	Price	Loan rate	Target price	Acreage reduction requirement	Yields	Base acreage
	($/unit)	($/unit)	($/unit)	(%)	(unit/acre)	(acres)
Central farm						
Cotton	.49/lb	.5225/lb	.794/lb	25.0	552 lbs	474
Wheat	2.02/bu	2.28/bu	4.38/bu	27.5	29 bus	36
Corn	2.98/bu	1.82/bu	3.03/bu	20.0	54 bus	54
Soybeans	4.97/bu	—	—	—	29 bus	—
Double-cropped Soybeans	4.97/bu	—	—	—	27 bus	—
Cow-calf	.48/lb	—	—	—	577 lbs	—
Northwest farm						
Cotton	.53/lb	.5225/lb	.794/lb	25.0	726 lbs	492
Wheat	2.95/bu	2.28/bu	4.38/bu	27.5	36 bus	38
Corn	2.09/bu	1.82/bu	3.03/bu	20.0	89 bus	56
Soybeans	5.18/bu	—	—	—	28 bus	—
Double-cropped Soybeans	5.18/bu	—	—	—	27 bus	—
Cow-calf	.48/lb	—	—	—	577 lbs	—

compliance prohibits participation in any farm program if one crop is planted beyond the base, it is not possible to expand the wheat base while participating in the cotton program. Rather than restrict wheat acreage over the five-year horizon, in this case the producer would opt out of the farm program for one year and plant the entire acreage in double-cropped wheat-soybeans. After this, program cotton and wheat (double-cropped with soybeans) are planted to the maximum allowed under the farm program and single-cropped soybeans utilize the remainder of the cropland. Five-year losses now total $257,097, making cross-compliance less "costly" to the producer than the five-year base.

The final policy alternative for the central farm is a five-year base with limited cross-compliance. The strategy evaluated is similar to that employed in the two-year base/limited cross-compliance scenario. The entire acreage is planted to nonprogram wheat-soybeans in year one, and subsequent acreages are determined by the maximum allowable wheat and cotton under farm program participation. In this case, losses total $290,760, considerably more than in any other policy alternative. Interestingly, the full "costs" of switching to a

TABLE 2. CROP MIX AND OBJECTIVE FUNCTIONS VALUE FOR REPRESENTATIVE CENTRAL ALABAMA FARM

Crop[a]	Year 1	2	3	4	5
	Acres Planted and Considered Planted				
Two-year Base and No Cross-compliance[b]			Objective Value -$240,736[c]		
Cotton	474	474	474	474	474
Wheat/Soybean	439[d]	439[d]	439	439	439
Soybeans	0	0	0	0	0
Corn	0	0	0	0	0
Five-year Base and No Cross-compliance			Objective Value -$267,681		
Cotton	474	474	474	474	474
Wheat/Soybean	439[d]	439[d]	197	229	268
Soybeans	0	0	242	210	171
Corn	0	0	0	0	0
Two-year Base and Limited Cross-compliance			Objective Value -$257,097		
Cotton	0	237	119	178	148
Wheat/Soybean	913[d]	475	694	584	639
Soybeans	0	202	101	151	126
Corn	0	0	0	0	0
Five-year Base and Limited Cross-compliance			Objective Value -$290,760		
Cotton	0	379	360	337	311
Wheat/Soybean	913[d]	211	246	289	339
Soybeans	0	322	306	287	264
Corn	0	0	0	0	0

[a] Unless otherwise noted, acreage is in farm program. Reported values are total of acreage planted and considered planted. For cotton in the program, planted acreage is 75 percent of the total. For wheat in the program, planted acreage is 72.5 percent of the total.

[b] The base is an arithmetical average of lagged acreage planted and considered planted. For years prior to the beginning of the planning horizon, it was assumed that planted and considered planted acreage equaled the beginning base (Table 1).

[c] Farm program payments can be calculated by multiplying planted acres by proven yield (Table 1) and the difference between target price and market price (Table 1).

[d] Represents acreage not in the farm program.

TABLE 3. CROP MIX AND OBJECTIVE FUNCTION VALUES FOR REPRESENTATIVE NORTHWEST ALABAMA FARM

Crop[a]	Year 1	2	3	4	5
	Acres Planted and Considered Planted				
Two-year Base and No Cross-compliance[b]			Objective Value $88,219[c]		
Cotton	492	492	492	492	492
Wheat/Soybean	456[d]	456[d]	456	456	456
Soybeans	0	0	0	0	0
Corn	0	0	0	0	0
Five-year Base and No Cross-compliance			Objective Value $77,571		
Cotton	492	492	492	492	492
Wheat/Soybean	456[d]	456[d]	456[d]	456[d]	373
Soybeans	0	0	0	0	72
Corn	0	0	0	0	11
Two-year Base and Limited Cross-compliance			Objective Value $50,410		
Cotton	948[d]	720	834	777	806
Wheat/Soybean	0	19	9	14	12
Soybeans	0	181	91	136	130
Corn	0	28	14	21	0
Five-year Base and Limited Cross-compliance			Objective Value -$10,194		
Cotton	492	492	492	492	492
Wheat/Soybean	38	38	38	38	38
Soybeans	362	362	362	362	362
Corn	56	56	56	56	56

[a] Unless otherwise noted, acreage is in farm program. Reported values are total of acreage planted and considered planted. For cotton in the program, planted acreage is 75 percent of the total. For wheat in the program, planted acreage is 72.5 percent of the total.

[b] The base is an arithmetical average of lagged acreage planted and considered planted. For years prior to the beginning of the planning horizon, it was assumed that planted and considered planted acreage equaled the beginning base (Table 1).

[c] Farm program payments can be calculated by multiplying planted acres by proven yield (Table 1) and the difference between target price and market price (Table 1).

[d] Represents acreage not in the farm program.

less flexible acreage regime are not captured by either of the new provisions separately.

Crop mix and program participation decisions on the northwest farm also vary considerably under the different policy scenarios. With a two-year base and no cross-compliance, the strategy is the same as the one selected on the central farm for this policy alternative. Program cotton is planted at the maximum allowable level in all five years. In years one and two, the farmer opts out of the wheat program and plants all the remaining acreage in double-cropped wheat and soybeans. In years three through five, the wheat acreage is enrolled in the program. Unlike the central farm, the northwest farm is a profitable venture under this alternative. Net worth increases by more than $88,000 in five years. With a five-year base and no cross-compliance, the producer would still enroll cotton in the program up to the maximum allowed in every year. Nonprogram wheat would be double-cropped with soybeans for four years, and program wheat would be double-cropped with soybeans in year five. This strategy is somewhat different from that employed on the central farm for the same policy alternative. In this alternative, net worth increases by about $77,500 over the five-year horizon. Thus, there is about a $9,500 decline in ending net worth caused by switching from a two-year to a five-year base.

When the two-year base is combined with limited cross-compliance, the northwest farm employs a strikingly different cropping pattern than previously noted. In the first year of the planning horizon, all crop acreage is planted in nonprogram cotton. Cotton acreage in years two through five is the maximum allowed by the program. (The base fluctuates somewhat because it is a moving average.) Program wheat double-cropped with soybeans is the maximum allowed in years two through five, as is program corn. The remaining acreage is allocated to single-cropped soybeans. In this case, ending net worth increases by about $50,000, a $38,000 decline from the case in which there was a two-year base and no cross-compliance. The limited cross-compliance provision alone is thus more "costly" to this farm than the change to the five-year base.

When both a five-year base and limited cross-compliance are enforced, the profitability of the farm is completely eroded and net worth decreases by $10,000 over the five-year horizon. In this scenario, the producer participates in the government programs for cotton, wheat, and corn in every year of the horizon. The remaining acreage is planted in soybeans.

CONCLUSIONS

Two provisions of the 1985 Farm Bill were isolated and analyzed: the change from a two- to a five-year average in calculating base acreage and enforcement of limited cross-compliance. These provisions profoundly affect program participation decisions, the crop-mix, and the profitability of two representative Alabama cotton farms.

When the switch from a two-year to a five-year base was made and limited cross-compliance was not enforced, the basic strategy of the producers did not change. Profitability decreased in each case, however, as the ability to expand the base of desirable program crops was reduced. On the other hand, adding limited cross-compliance to the two-year base models resulted in a complete change of strategy on both farms. Limited cross-compliance also resulted in decreased income.

When both limited cross-compliance and the five-year base were used, profitability decreased considerably. Thus, the "costs" of switching to a less-flexible program are not adequately captured by either component separately. On the central farm, the cross-compliance/five-year base strategy was similar to the cross-compliance/two-year base strategy. On the northwest farm, however, an entirely different strategy was chosen.

This paper has demonstrated that these two provisions have extremely important consequences for cotton farms. It should also be noted that on one of the two farms analyzed, even the combination of limited cross-compliance and a five-year base did not result in the farmer simply staying with his or her given bases in every year. Thus, these requirements may not be entirely effective in "fixing" future farm program acreages. Policy makers should consider whether the loss in farmer flexibility is compensated for by a more stable supply. This type of question may be best answered using industry-level models. In addition, such models might be used to address the issue of resource use (or misuse) under the alternative provisions.

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