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Economic Analysis of Base Acre and Payment Yield Designations Under the 2002 U.S. Farm Act

C. Edwin Young, David W. Skully, Paul C. Westcott, and Linwood Hoffman

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Abstract

The 2002 Farm Act provided farmland owners the opportunity to update commodity program base acres and payment yields used for calculating selected program benefits. Findings in this report suggest that farmland owners responded to economic incentives in these decisions, selecting those options for designating base acres that resulted in the greatest expected flow of program payments. Decisions of farmland owners in South Dakota, in upland cotton area, and in the Heartland region support the payment-maximization argument. In general, landowners favored maximizing payments over aligning base acres to current or recent plantings. Farmland owners with high-payment base acres, such as rice and cotton, held on to these base acres and, whenever possible, expanded them. Analogously, landowners with low-payment commodity base acres, such as oats and barley, switched to higher payment commodities whenever possible.

Keywords: base, 2002 Farm Act, direct payments, counter-cyclical payments, production flexibility contract payments, base acres, program yields.

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Summary

The 2002 Farm Act provided farmland owners the opportunity to update commodity program base acres and payment yields, which are used to calculate selected program benefits, namely, direct and counter-cyclical payments. Farmland owners had five options from which to select for designating base acres. Four options involved designating 1996 Farm Act production flexibility contract (PFC) acreage as base acres, allowing for the addition of oilseed acres, as applicable. The other option permitted farmland owners to designate base acres using actual plantings for all program commodities in 1998-2001. Analysis suggests that farmland owners viewed the update decision in economic terms: program participants selected the option that resulted in the greatest expected flow of program payments.

Acreage bases were originally determined in the early 1980s and continued through the mid-1990s as part of the annual acreage reduction and deficiency payment programs. Base acres were slow to change as they were determined annually using recent years' land use on the farm. The 1996 Farm Act eliminated annual base acres used for calculating program payments, replacing them with multiyear PFC acreage. The 2002 Farm Act returned "base acres" to agricultural program terminology but as a multiyear designation used to determine program payments that do not depend on current production.

What Is the Issue?

An examination of the underlying economic rationale for base acre and payment yield designation decisions made under the 2002 Farm Act helps address the issue of whether direct and counter-cyclical payments are linked to current production decisions. Base acres are a major determinant of farm program benefits (or proceeds) from direct and counter-cyclical payments. Was the updating decision influenced by management of revenue risk associated with current production choices or alternatively by efforts to maximize direct and counter-cyclical program payments independent of current production decisions?

What Did the Study Find?

Results suggest, in general, that farmland owners made base designation decisions to maximize direct and counter-cyclical payments. Findings do not support an alternative hypothesis that participants sought to align base acres and program yields (and thus payments) to current plantings and production. In many cases, farmland owners elected crop base acres that differed substantially from current plantings. Further, the lack of a strong link between program acres (base or PFC) and year-specific plantings is consistent with the proposition that direct and counter-cyclical payments are largely perceived as cash transfers that are separate from commodity production decisions and output levels.

Program signup results indicate that a majority of farmland owners elected not to update program base acres to 1998-2001 plantings. Many farmland owners opted to keep PFC acreage as base acres and augment them with

oilseed acreage when advantageous. Less than 20 percent of farmland owners updated their base acres, representing 39 percent of base acres. This higher share of acres relative to owners indicates that, in general, farmland owners who updated base had larger-than-average-sized farm operations.

The base designation decision was viewed primarily in economic terms related to program payments. Case study analysis of decisions by farmland owners in South Dakota, in upland cotton area, and in the Heartland region supports the idea that farmland owners generally chose the option that provided the highest direct and counter-cyclical payments. If updating base acres for all crops to 1998-2001 plantings provided a greater flow of payments, farmland owners opted to update. Base was not updated if it did not prove to be economically advantageous.

In general, farmland owners replaced low-payment base acres with high-payment acres whenever possible. They kept or expanded base acres with high payments, such as rice, cotton, and corn, and reduced bases acres for commodities with relatively low payments, such as wheat, sorghum, and barley. Base acres for oats, the commodity with the lowest per acre payments, were reduced the most.

A comparison of expected payment flows associated with each covered commodity shows that optimal rankings of the value of base acre payments by program commodity are nearly identical with or without counter-cyclical payments (at maximum expected levels). Rice base typically pays more than cotton base; cotton base pays more than corn base; corn base payments exceed those for sorghum and wheat, etc. Consequently, if one maximizes direct payments, one nearly always maximizes direct plus expected counter-cyclical payments.

Producers of cotton and corn who expanded production of these commodities in 1998-2001 relative to PFC acres tended to update base acres to these higher paying commodities. Conversely, farmland owners with cotton and corn PFC acres who reduced plantings of those crops generally elected to keep their PFC acreage as base acres to retain the more valuable base acres.

How Was the Study Conducted?

ERS used a statistical modeling approach to analyze county-level results of farmland owners' base designation decisions. The model was applied to three case studies. Case studies focused on decisions in three counties in South Dakota, to illustrate county- and farm-level economic incentives of the base designation choice; the decision to update base for a single commodity—cotton; and updating decisions for the Heartland region, where corn and soybeans dominate.

The economic value of each base designation option was calculated for each commodity and location. The spatial nature of the decision was illustrated by mapping the results of the base designation decision relative to plantings. Maps are available at *www.ers.usda.gov/data/baseacres/*. The payment maximization hypothesis was tested using statistical analyses for selected commodities and regions.

Economic Analysis of Base Acre and Payment Yield Designations Under the 2002 U.S. Farm Act

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Introduction

The Farm Security and Rural Investment Act of 2002 (2002 Farm Act) provides income support to U.S. agriculture through various programs for 2002-07, including direct and counter-cyclical payments. Direct payments replaced production flexibility contract (PFC) payments provided under the 1996 Farm Act. Counter-cyclical payments were newly designed under the Act to replace market loss assistance payments that had been provided on an ad hoc basis during 1998-2001. Direct and counter-cyclical payments are determined using base acres and program payment yields. Base acres reflect historical use of the land for eligible crops, and program payment yields are historically determined commodity yields. The 2002 Farm Act gave farmland owners several options for establishing base acres, including retaining their existing PFC acreage as base acres and other similar alternatives or updating base acres using actual plantings during 1998-2001. In addition to granting eligibility to the seven crops (corn, grain sorghum, barley, oats, wheat, rice, and upland cotton) eligible for PFCs, the Act also permitted farmland owners to include oilseeds in base acres.

Program signup results indicate that a majority of farmland owners elected not to update program base acres to 1998-2001 plantings. Many farmland owners opted to keep PFC acreage as base acres and augment them with oilseed acreage when advantageous. Less than 20 percent of farmland owners updated their base acres, representing 39 percent of base acres. This higher share of acres relative to owners indicates that, in general, farmland owners who updated base acreage had larger-than-average-sized farm operations.

This report explores the base acre and yield designation decisions made by program participants under the 2002 Farm Act to determine if choices were influenced by current plantings or, alternatively, by efforts to maximize direct and counter-cyclical program payments independent of current plantings. A related issue not directly investigated in this report is whether expectations of future opportunities to update base acres and payment yields may influence current production decisions. Allowing acreage bases and payment yields to be updated could distort production if farmland owners do not fully respond to signals from the marketplace but instead respond to market signals augmented by expected benefits of future programs and program changes (Westcott and Young). Anton et al. and Sumner identify a number of factors that would influence any such effect, including the probability of

future updating, the timing of the update, the basis for the update, the discount rate, and the marginal value of the updated payments. Estimating the impacts of expectations of future base updating is further complicated by the difficulty of anticipating future policy decisions and assessing farmland owners' perceptions of the probability of future opportunities to update payment acres and program yields. Anton et al. note that "once the expectation is well defined, there are economic techniques that allow the magnitude of these effects to be estimated. However, there are no standard economic techniques to estimate the nature and magnitude of these expectations or the mechanisms that generate them."

Role of Base Acres and Program Yields in U.S. Agricultural Policy

Historically, base acres and program yields have played important roles in determining farm program benefits. In the mid-1930s, cotton farmers agreed to limit plantings to 55-65 percent of their average acreage planted in 1928-32 in return for direct cash payments. Acreage allotments replaced base acres in the 1950s and remained as payment determinants until the 1977 Farm Act adopted current plantings as the payment base. The 1981 Farm Act re-established base acres and program yields for the annual acreage reduction and deficiency payment programs, which continued to be used through the 1990 Farm Act. During this period, program rules constrained growth in base acres and payment yields. The 1996 Farm Act eliminated annual base acres used to calculate deficiency payments, replacing them with multiyear production flexibility contract acreage. The 2002 Farm Act returned "base acres" to agricultural program terminology; however, as a multiyear designation used for direct and counter-cyclical payments that do not depend on current production, the term's meaning is conceptually closer to contract acreage under PFCs than to prior programs' base acreage. Base acre and program yield provisions since 1981 are summarized in the appendix.

Changes in base acreage and program yields were made as U.S. agricultural commodity policy moved toward increasing market orientation with the introduction of programs that reduced the degree of coupling of benefits to production (Young and Westcott; Westcott and Young; and Orden et al.). This trend reflects, in part, the related policy goals of reducing market distortions and fulfilling commitments under international trade agreements.

Planting Flexibility Allowed Movement Away From Base Acres

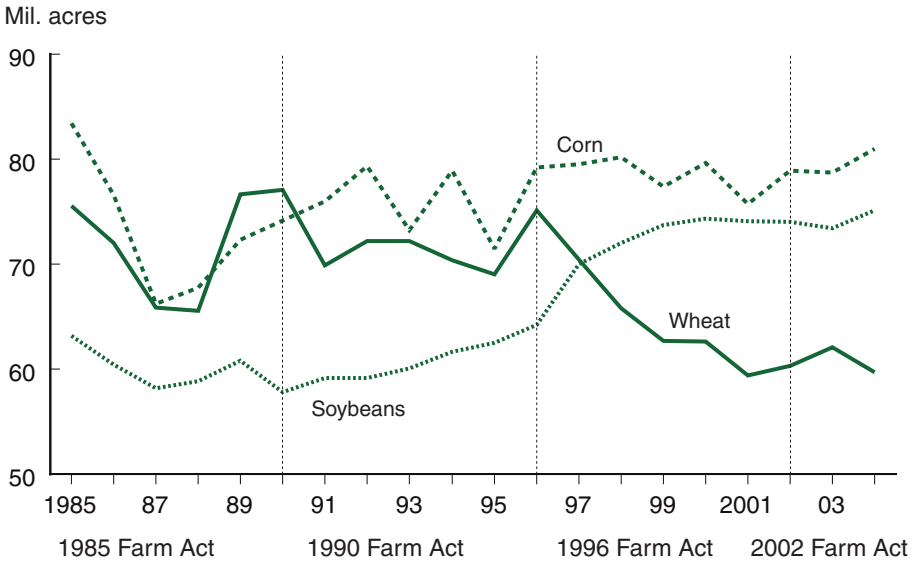
Increased planting flexibility provided by farm legislation in 1990 and 1996 reduced incentives for producers to keep plantings within base acreage to be eligible for price and income support payments (Lin et al.). This effort facilitated producers' changes in planting mix in response to changes in relative prices among crops and expected marketing loan benefits. Limited planting flexibility introduced in the 1990 Act spurred increases in oilseed production, particularly soybeans (fig. 1). With acreage constraints removed in 1996, U.S. soybean acres continued to increase until leveling off at around 74 million acres in 1999. While soybean acreage expanded, U.S. wheat acreage contracted from an annual average of 72 million acres in the early 1990s to around 60 million acres by 2001.

Regional adjustments in plantings were even more pronounced. Agronomic advances, such as higher yielding and shorter growing-season corn and soybean varieties, expanded the range of cropping alternatives available to producers in the Plains States. For example, during the 1990s, soybean acreage in South Dakota increased almost 70 percent, while corn area increased about 12 percent and wheat area declined about 6 percent (fig. 2). Eradication of the boll weevil enabled Southeastern States to expand cotton production. Planting flexibility allowed producers in this region to respond to higher returns to cotton production and plant more acres to cotton (fig. 3). Still, while many producers were able to take advantage of these agronomic advances in the early 1990s on normal flex acreage, their responses were limited by base acreage constraints.

Increased planting flexibility under the 1996 Farm Act further facilitated producers' changes in land use. National, State, and county data reveal that

Figure 1

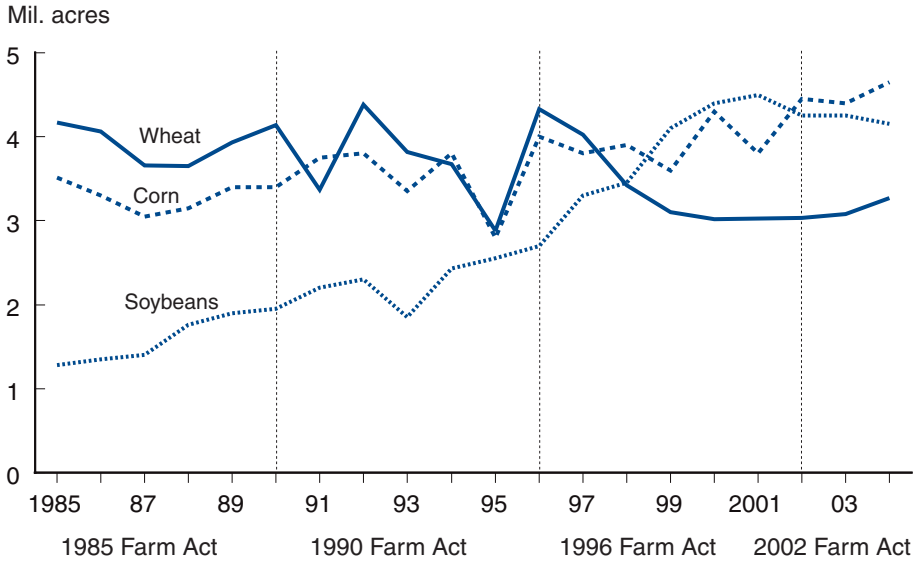
Planting flexibility enabled farmers to alter plantings, 1985-2004



Source: Compiled by USDA's Economic Research Service from the National Agricultural Statistics Service.

Figure 2

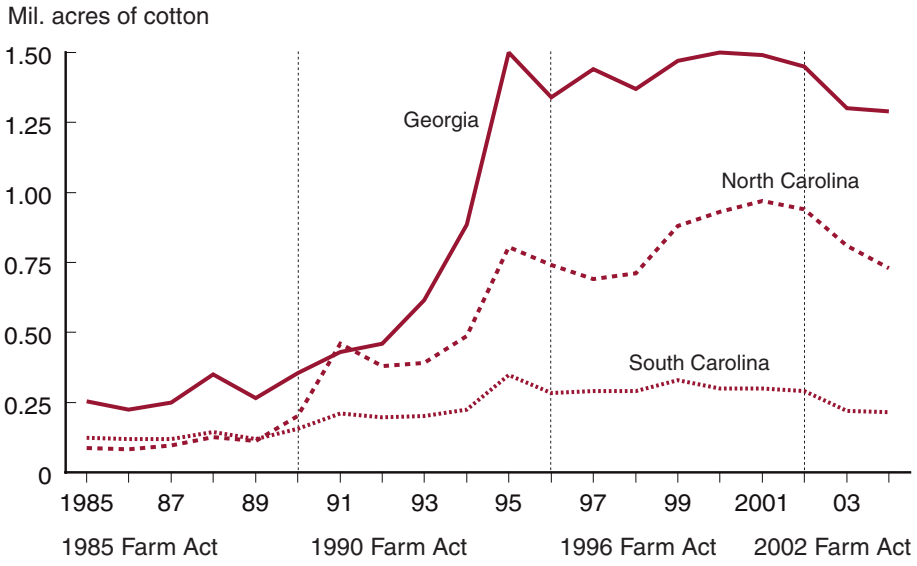
South Dakota farmers used planting flexibility to alter plantings, 1985-2004



Source: Compiled by USDA's Economic Research Service from the National Agricultural Statistics Service.

Figure 3

Cotton farmers in the Southeast used planting flexibility, 1985-2004

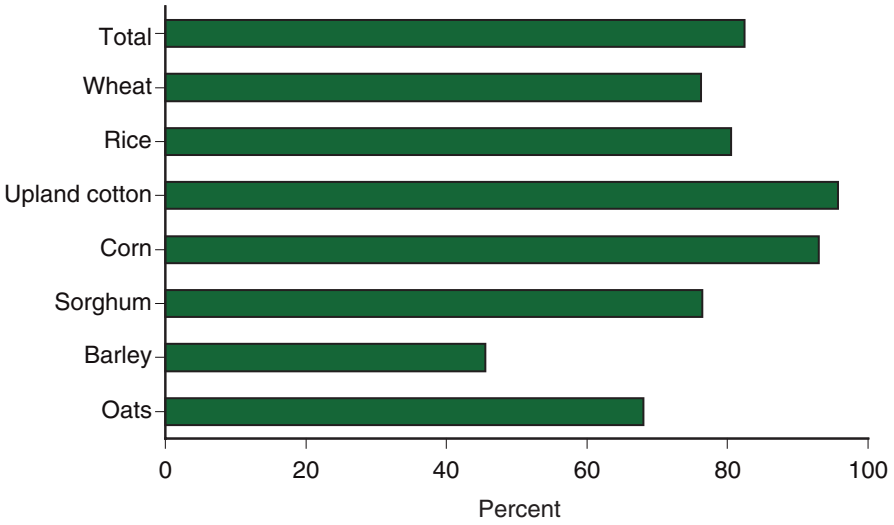


Source: Compiled by USDA's Economic Research Service from the National Agricultural Statistics Service.

by 2001, planting flexibility enabled planted acreage to diverge significantly from PFC acreage. Production choices appear to reflect the ability of farmers to respond to expected market returns among competing crops (augmented by expected marketing loan benefits when prices are low), as well as to agronomic and rotational considerations. In 2001, total national plantings to the seven PFC program crops represented about 82 percent of total contract acreage under PFCs (fig. 4). On a crop-specific basis, shares

Figure 4

Plantings as a share of production flexibility contract acres, 2001



Source: Compiled by USDA's Economic Research Service from the National Agricultural Statistics Service.

of PFC acreage planted ranged from a low of 45 percent for barley to a high of about 96 percent for upland cotton. Producers used planting flexibility to expand production of oilseeds or to leave some of their contract acreage idle. U.S. soybean plantings increased by 11.5 million acres between 1995 and 2002.

Examination of aggregate planting data relative to contract acreage masks responses to planting flexibility at the individual producer level. While producers in a region can expand production of a commodity, such as corn, relative to the contract acres, other producers can offset the change in area planted by reducing corn plantings by a similar amount. Although individual producer data are not available for this study, data on county-level planting and program acreage are available. These data indicate significant variation in county-level plantings relative to crop-specific PFC acreage.

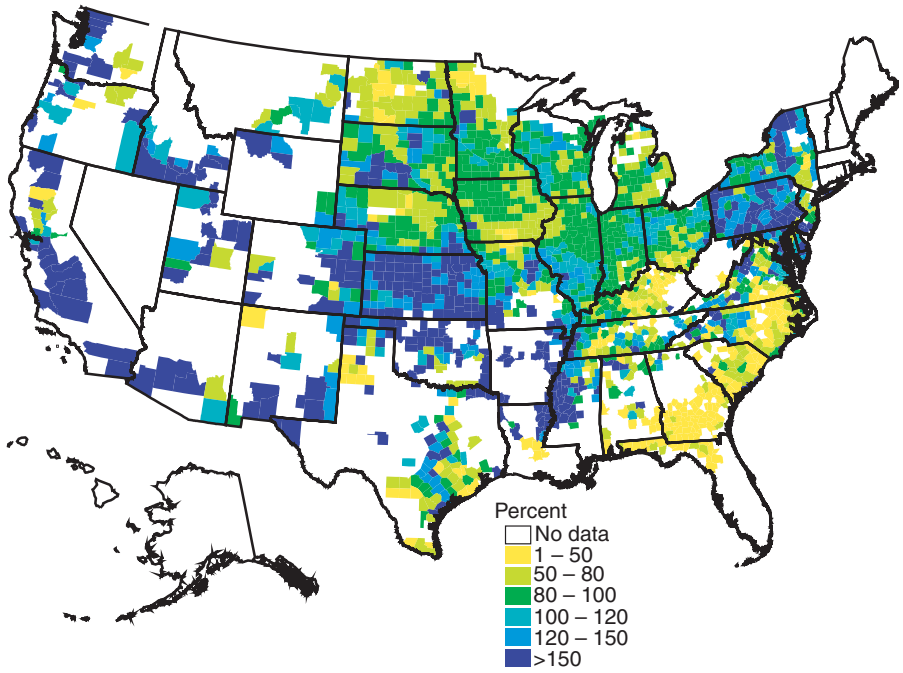
Nationally, corn plantings accounted for about 93 percent of corn PFC contract acreage in 2001. In counties where data on corn plantings are available, actual corn acreage planted (25.5 million acres) exceeded available PFC acreage (19.0 million acres) for 42 percent of the counties.[1] Producers in the remaining counties planted less corn acreage (50.3 million acres) than available contract acreage (61.4 million acres). Corn acreage expanded in the Plains States, the Lower Mississippi River Valley, the Northeast, and the Far West as farmers used planting flexibility to take advantage of higher net returns for newer corn varieties (fig. 5).

Similarly, wheat plantings relative to wheat PFC acreage vary at the county level. County-level wheat plantings in 2001 show no strong link to wheat PFC acreage, again reflecting the absence of supply management constraints and the use of planting flexibility (fig. 6). Wheat production declined in parts of the Corn Belt and on the eastern edge of the Plains States as corn and soybean

[1]USDA's National Agricultural Statistics Service estimates area planted for major commodities. Statistically reliable estimates are not available for all counties in the United States. County-level estimates are prepared for corn area (approximately 2,000 counties), wheat area (approximately 2,200 counties), and upland cotton area (approximately 450 counties).

Figure 5

Corn plantings relative to corn production flexibility contract acres, by county, 2001



Percent of corn PFC acres planted, 2001

Share of PFC acres planted	Planted acres	PFC acres	Share of PFC acres planted (avg.)	Number of counties
Percent	*—— 1,000 acres ——*		*Percent*	
1 to 50	1,123	3,526	31.9	244
50 to 80	13,819	19,221	71.9	427
80 to 100	34,670	38,676	89.6	484
100 to 120	11,957	11,161	107.1	260
120 to 150	5,384	4,132	130.3	186
Over 150	8,179	3,732	219.2	392

Note: The graduated color classes used in the maps are represented in the map legend by break values for each range and, thus, seem to have overlapping numbers. For example, the range “50 to 80” is from 50.1 up to 80.0 and the range “80 to 100” is from 80.1 up to 100.0.

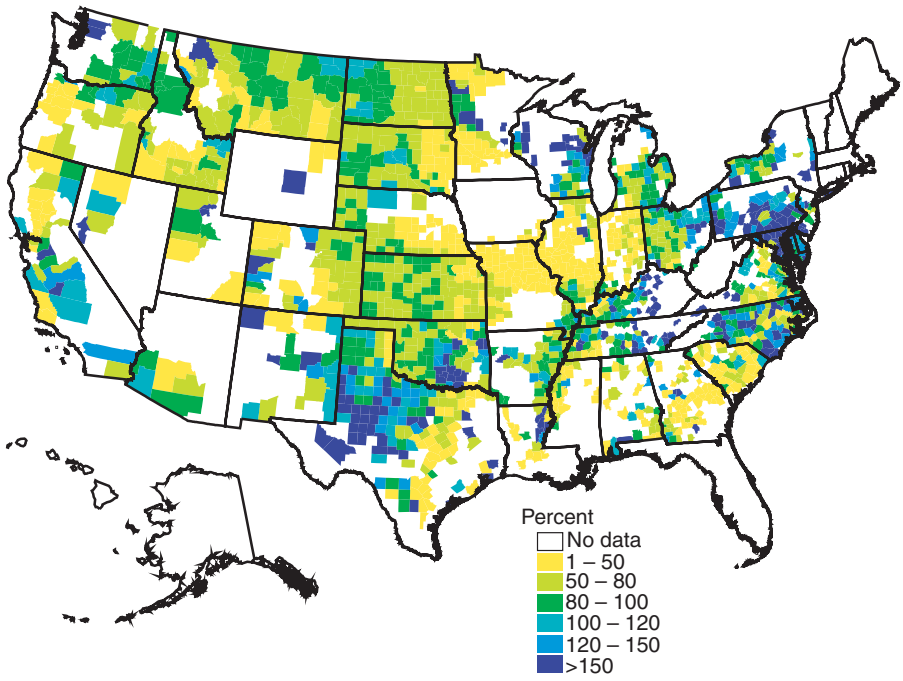
Sources: Compiled by USDA’s Economic Research Service from the Farm Service Agency and the National Agricultural Statistics Service.

production increased in these regions. Wheat production increased relative to contract acreage in western Texas as cotton acreage declined.

The national level of upland cotton planted acreage represented 96 percent of PFC acres in 2001; however, at the State level, upland cotton plantings were more than 20 percent below cotton PFC acreage in Arizona, New Mexico, California, and Oklahoma, and were more than 20 percent higher than cotton PFC acreage in Florida, Georgia, North Carolina, South Carolina, Virginia, and Kansas. The divergence between plantings and contract acreage is even more apparent at the county level (fig. 7). For example, cotton acres exceeded historically based cotton PFC acreage in the Southeastern States of North Carolina, South Carolina, and Georgia as farmers used planting flexibility provided under the 1996 Farm Act.

Figure 6

Wheat plantings relative to wheat production flexibility contract acres, by county, 2001



Percent of wheat PFC acres planted, 2001

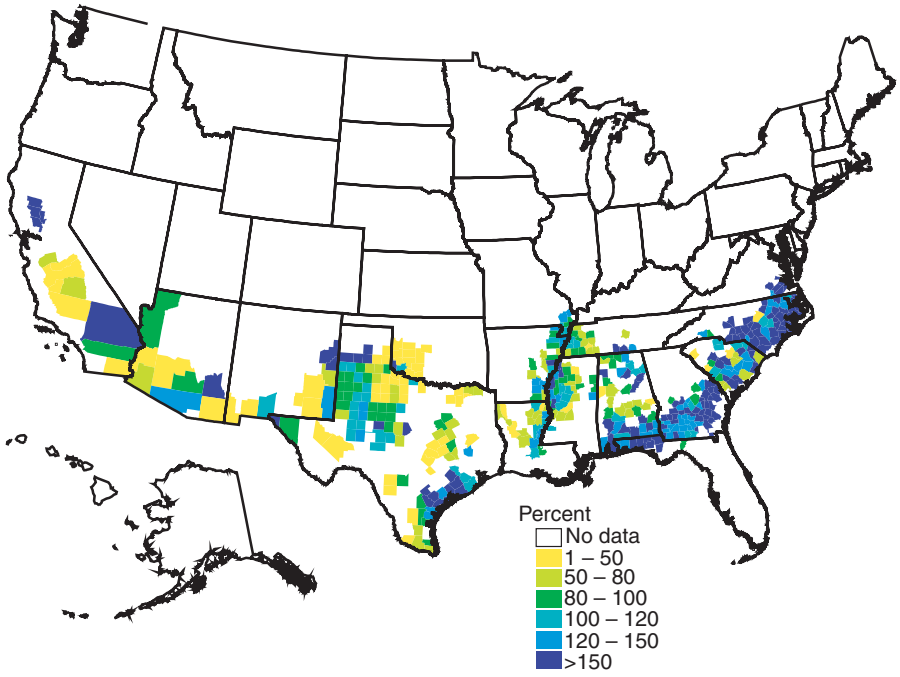
Share of PFC acres planted	Planted acres	PFC acres	Share of PFC acres planted (avg.)	Number of counties
Percent	*—— 1,000 acres ——*		*Percent*	
1 to 50	3,283	10,202	32.2	474
50 to 80	22,270	32,602	68.3	477
80 to 100	20,837	23,804	87.5	319
100 to 120	7,793	7,204	108.2	142
120 to 150	2,088	1,571	132.9	125
Over 150	2,546	1,066	238.8	202

Note: The graduated color classes used in the maps are represented in the map legend by break values for each range and, thus, seem to have overlapping numbers. For example, the range “50 to 80” is from 50.1 up to 80.0 and the range “80 to 100” is from 80.1 up to 100.0.

Sources: Compiled by USDA’s Economic Research Service from the Farm Service Agency and the National Agricultural Statistics Service.

Figure 7

Cotton plantings relative to cotton production flexibility contract acres, by county, 2001



Percent of upland cotton PFC acres planted, 2001

Share of PFC acres planted	Planted acres	PFC acres	Share of PFC acres planted (avg.)	Number of counties
Percent	*—— 1,000 acres ——*		*Percent*	
1 to 50	948	2,567	36.9	66
50 to 80	1,540	2,372	64.9	67
80 to 100	3,707	4,105	90.3	65
100 to 120	3,601	3,327	108.2	54
120 to 150	2,839	2,163	131.2	68
Over 150	2,556	1,279	199.8	146

Note: The graduated color classes used in the maps are represented in the map legend by break values for each range and, thus, seem to have overlapping numbers. For example, the range “50 to 80” is from 50.1 up to 80.0 and the range “80 to 100” is from 80.1 up to 100.0.

Sources: Compiled by USDA’s Economic Research Service from Farm Service Agency and National Agricultural Statistics Service.

The 2002 Farm Act

The 2002 Farm Act extended many of the types of programs of the 1996 Farm Act. Marketing assistance loans were continued, direct payments replaced PFC payments, and counter-cyclical payments institutionalized market loss assistance payments. The 2002 Act also retained nearly full planting flexibility,[2] thus enabling farmers to continue to respond to market signals and expected marketing loan benefits in their production choices. Provisions of the Act added soybeans and other oilseeds to the list of crops eligible for direct and counter-cyclical payments. The legislation also allowed farmers to designate base acres used for direct and counter-cyclical payments to reflect 1998-2001 plantings.

The Base-Designation Decision

The 2002 Farm Act required eligible farmland owners to enroll or re-enroll for the new direct and counter-cyclical payment program with USDA's Farm Service Agency (FSA). Enrollment obligated eligible farmland owners to designate base acres that, along with program yields, determine direct and counter-cyclical payments.[3] Owners who updated base acres also had the option to update payment yields for counter-cyclical payments but not for direct payments. Payments for direct payments and counter-cyclical payments are the product of their respective national payment rates, the farm's payment acres (85 percent of base acres), and the farm's payment yields. Young (2002) provides a description of the program's provisions.

Five options were available for designating base acres under the 2002 Act including options that allowed for inclusion of oilseed acres.[4] Farmland owners had to select one option for designating base acres on their farm. To illustrate these options, we look at an example of a farm with 70 acres of corn PFC acres and 10 acres of wheat PFC acres enrolled under the 1996 program (table 1). This farm was planted with an average of 60 acres of corn, 10 acres of wheat, and 30 acres of soybeans in 1998-2001. The sum of acres planted to these program crops is 100 acres: this amount is the maximum number of acres the farm can designate as base. This farm also planted 50 acres to alfalfa during 1998-2001. Since alfalfa was not a program crop under the 1996 Farm Act or a covered commodity under the 2002 Farm Act, these acres do not count toward the farm's maximum program base acreage. Options are as follows:

- *Status quo, keeping PFC acres unchanged:*

  ***Option 1*:** Base acres equal the contract acreage (70 acres of corn base and 10 acres of wheat base) that would have been used for 2002 PFC payments.

- *Augment PFC acres by adding oilseeds (three variants):*

  ***Option 2*:** Base acres equal the contract acreage that would have been used for 2002 PFC payments (as in option 1), *plus* the average oilseed acreage planted in 1998-2001, up to the base acreage maximum (total area planted or prevented from planting to eligible crops in 1998-2001). Under this option, the farmland owner could add 20 acres of soybean base to the 70 acres of corn base and 10 acres of wheat base. This was

[2]Planting for harvest of fruits, vegetables (other than lentils, mung beans, and dry peas), and wild rice (after 2000) was prohibited on PFC acres, except in the following situations: (1) Harvesting double-cropped fruits, vegetables, and wild rice on base acres was permitted, without loss of payments, in any region that has a history of double-cropping covered commodities with the otherwise prohibited crops. An individual farm need not have a double-cropping history, only the region; (2) Harvesting of any fruits, vegetables, or wild rice on PFC acres was permitted, with an acre-for-acre loss of PFC payments for each acre planted to the otherwise prohibited crop, if the U.S. Secretary of Agriculture determined that there was a history of planting those crops on the farm; and (3) Harvesting a specific fruit, vegetable, or wild rice on PFC acres was permitted, with an acre-for-acre loss of PFC payments for each base acre planted to the specific crop, if the Secretary determined that the producer had an established planting history of the specific crop.

[3]USDA Farm Service Agency correspondence regarding base designation was directed to the landowner, who frequently is the farmer or operator. In many instances where the owner is not the operator, the owner made the decision in consultation with the operator or asked the operator to actually designate base.

[4]Base for peanuts was designated separately from other commodities

Table 1
Example of base-designation alternatives

Item	Corn	Wheat	Soybeans	Total crops program	Alfalfa
			Acres		
Plantings and 1996 farm act program parameters:					
1998-2001 plantings	60	10	30	100	50
Production flexibility contract (PFC) acres	70	10	--	80	--
Base designation alternatives:					
PFC augmentation/adjustment options					
Option 1, PFC acres	70	10	--	80	--
Option 2, PFC acres plus oilseeds up to total permitted	70	10	20	100	--
Option 3, oilseed acres plus PFC acres up to total permitted	70	0	30	100	--
Option 5, mix of PFC acres and oilseed acres up to total permitted	70	0-10	20-30	100	--
Update option					
Option 4, average 1998-2001 plantings	60	10	30	100	--

-- = Not eligible.

Source: USDA's Economic Research Service.

the default option: a farm owner who did not make an election was considered by FSA to have elected option 2.

***Option 3*:** Base acres equal PFC acres plus oilseeds (option 2), but with a PFC offset. This option allowed a farmland owner to add the full amount of oilseed plantings (30 acres) by reducing PFC base, if necessary. In the example, the farm is assumed to reduce wheat base, rather than corn base, as wheat generally has lower payments per acre.

***Option 5*:** Base acres equal PFC acreage, with oilseed base added by reducing PFC acres. This option allowed farmland owners to add some, but not all oilseed plantings. Under this option the farm owner could add between 20 and 30 acres of soybean base. Option 5 is a blend of options 2 and 3.

- *Update base to 1998-2001 plantings:*

***Option 4 (updating)*:** Base acres equal the average acreage planted and prevented from planting in 1998-2001. Base designation under option 4 most closely reflects recent planting history.

Payment yields for direct payments are unchanged from those used in the 1996 Act except for yields for soybeans and other oilseeds, which were not part of the 1996 Act's production flexibility contract payments.[5] Yields for oilseeds payments are determined by the farm's 1998-2001 average yields multiplied by the adjustment factor.[6] This value is the ratio of the national average yield for 1981-85 to the national average yield for 1998-2001. This adjustment makes oilseed program yields comparable to the program yields for corn, wheat, and other nonoilseed program crops.

[5]Soybeans and other oilseeds were eligible for marketing loans under the 1996 Farm Act.

[6]The adjustment factors are 0.65 for flaxseed, 0.80 for sunflower seed, and 0.78 for soybeans and the rest of the other oilseeds (canola, safflower, mustard seed, rapeseed, sesame, and crambe).

Farm owners who updated base acres under option 4 also had to choose how to designate payment yields for CCPs:

- *Yield designation A:* Set CCP yields equal to PFC yields.
- *Yield designation B:* Set CCP yields equal to the weighted average of the PFC yield and the 1998-2001 average yields. The weights were 30 percent of PFC and 70 percent of 1998-2001.
- *Yield designation C:* Set CCP yields equal to 1998-2001 yields times an adjustment factor of 93.5 percent.

The method selected applied to all program commodities; that is, one could not use one method for corn and another method for wheat. Like the base acreage designation options, the yield designations are combinations of a farm's PFC yields and its 1998-2001 yields (per planted acres).

Signup Results

Overall, FSA reported that only 39 percent of eligible base acres were updated (table 2). However, base updating to reflect 1998-2001 plantings varied by region and commodities produced. Examination of the updated base acres at the county level reveals clear spatial patterns (fig. 8). Tidewater Virginia and North Carolina, for example, had larger cotton area in the mid-to-late 1990s following the eradication of the boll weevil in this region as well as increased planting flexibility. Cotton base is very valuable; thus, updating allowed farmland owners in the region to increase cotton payment acres for direct and counter-cyclical payments. Other spatial concentrations where base updating was high include eastern South Dakota and western Minnesota.

Table 2
Base designation results under 2002 Farm Act[1]

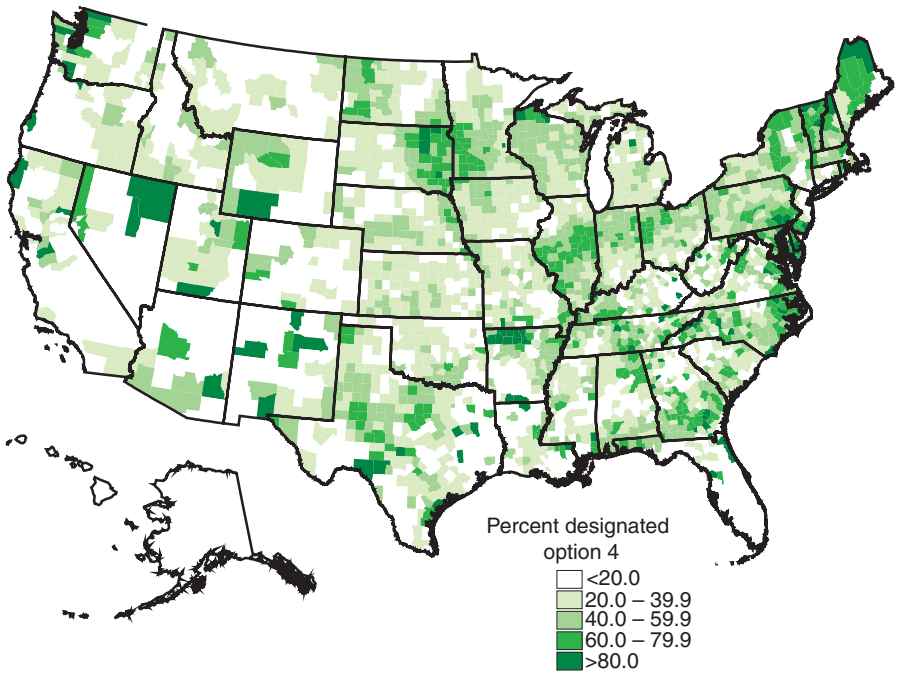
Base designation options	Base acres	Farms as defined by FSA	Producers
		Percent	
Option 1 (keep PFC acreage)	23.1	24.1	35.1
Options 2, 3, and 5 (PFC acreage augmented/adjusted for oilseeds)	37.8	35.2	45.2
Option 4 (1998-2001 plantings, all crops)	39.1	40.7	19.7
	Enrolled acres	Enrolled farms	Enrolled producers
		Million acres	
Total	267.9	1.9	1.3

[1]Excludes peanuts.

Source: Compiled by USDA's Economic Research Service from the Farm Service Agency.

Figure 8

Percent of eligible acreage that updated base acreage to 1998-2001 plantings, 2002 Farm Act



Percent of base acres designated option 4

Share of acres designated option 4	Acres designated option 4	All base acres enrolled	Number of producers designating option 4	Number of producers designating base	Number of counties
Percent	—— *1,000 acres* ——				
Under 20.0	6,130	45,747	43,887	210,355	872
20.0 to 39.9	30,757	101,858	201,362	522,035	999
40.0 to 59.9	39,802	80,132	227,408	414,283	731
60.0 to 79.9	25,357	36,997	120,820	175,883	351
Over 80.0	2,731	3,176	9,657	12,205	103

Source: Compiled by USDA's Economic Research Service from the Farm Service Agency.

Economics of Base Designation

The base designation decision can be framed as a payment maximization issue. The choices facing each decisionmaker were completely determined by the farm's program history and its planting and production histories. The objective of farmland owners' base acre designations was to maximize the expected flow of direct and counter-cyclical payments. After designating base, the objective of farmers making current planting decisions was to maximize farm enterprise income (including any expected marketing loan benefits). Base acreage designated under the 2002 Act is constrained from being planted to fruits and vegetables under certain conditions, and farmers must also adhere to some conservation standards. Beyond these two constraints, farmland owners designating base face no restriction on the use of acreage in crop production. Moreover, for an individual farmer, current plantings have no influence on the flow of direct and counter-cyclical payments. The base designation decision of the 2002 Act and a farm operator's subsequent production decisions are independent decisions.[7]

The base designation decision included decoding technical jargon, gathering information, and performing basic arithmetic. From there, the process is analogous to filing Internal Revenue Service tax forms. The decision to itemize deductions or to take the standard deduction depends on which option results in a lower tax liability. Similarly, the acreage and yield designation decisions depend on which alternative results in the greatest flow of program payments. Many farmland owners and operators found the process confusing. In response, USDA, in collaboration with Texas A&M University, developed the Base and Yield Update Option Analyzer, a Web-based tool for evaluating base and yield options for direct and counter-cyclical payments under the 2002 Farm Act (USDA; Richardson et al.). This computer-based tool helped producers analyze the economic consequences of selecting different base and yield options.

The optimum choice among options can be determined in three steps. First, determine which of options 1, 2, 3, and 5 results in the greatest payment flow. Second, using 1998-2001 acreage for option 4 base acres, determine which yield designation results in the greatest payment flow. These two maxima can be determined by eliminating inferior options. Third, of these two maxima, choose the one that provides the greater payment flow.

Direct payments are fixed, but counter-cyclical payments are contingent on national marketing year average prices. The calculation of the expected future value of counter-cyclical payments requires forecasting season average prices several years into the future. We estimated the expected counter-cyclical payments as the average counter-cyclical payment that would have been paid had counter-cyclical payments been paid for the 1991-2000 marketing years.[8] The simulated payments are calculated using the national marketing-year average prices received for each program commodity. While yields and prices received for individual farms can differ significantly from national averages, the basic process is nevertheless the same for the individual farm. However, such calculations are generally unnecessary. The comparison of expected payment flows associated with each base commodity is relatively straightforward. With the exception of

[7]As noted previously, expectations of future opportunities to update base could influence current planting decisions if the expected value of future payments exceeds any income foregone in the current period.

[8]Peanuts prices for 2002-04 were used since peanut prices prior to that time period were largely determined by the price supporting marketing quota.

wheat and sorghum payments, the value rankings of direct payments and of direct plus maximum counter-cyclical payments are identical (fig. 9). Rice base always pays more than cotton base; cotton base pays more than corn base; corn base pays more than sorghum base, etc. Direct payments are thus a sufficient substitute for the sum of direct and counter-cyclical payments. Direct payments fail to be a perfect proxy in some combinations of base endowments, yields, risk preferences, and price expectations. Consequently, if one maximizes direct payments, one nearly always maximizes direct plus expected counter-cyclical payments.

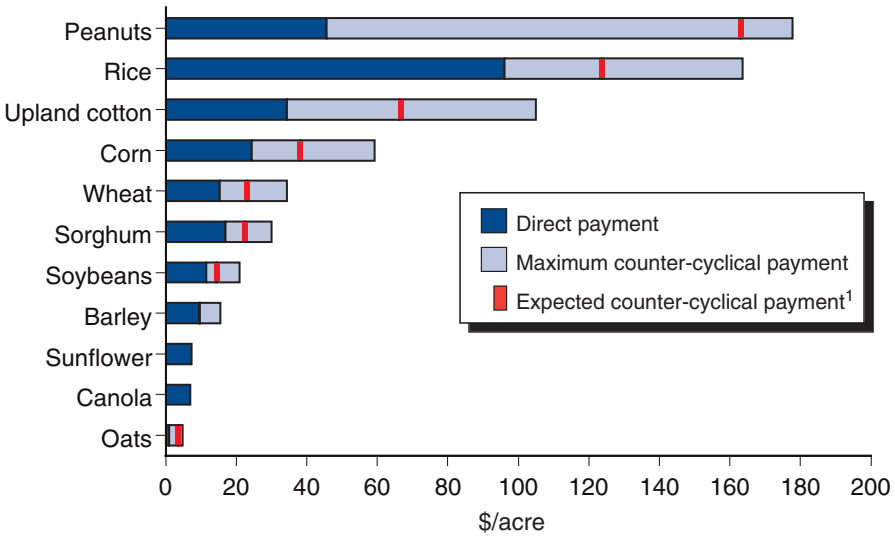
Finding the Optimum Among Options 1, 2, 3, and 5

Option 2 is the default designation. The choice among options 1, 2, 3, and 5 is straightforward: to the extent possible, one discards low-payment base acreage and replaces it with higher paying oilseed base acreage. Option 3 is the corner solution and option 5 is an interior solution to the oilseed base substitution issue. Returning to the example in table 2, if the farm has national average program yields (see fig. 9), then direct payments for its existing wheat base acres ($15.26) are worth more than potential payments for soybean base acres ($11.51), and option 2 is thus worth more than options 3 and 5. It is possible, however, that an individual farm will have program yields for soybeans sufficiently greater than its program yields for wheat so that options 3 or 5 dominate option 2.

Rice, cotton, and corn base are almost always worth more per acre than soybean base; the rare exceptions arise when program yields for these three crops are very low relative to soybean program yields.[9] Thus, when rice, cotton, or corn constitutes a large share of a farm's PFC acreage, option 2

Figure 9

Value per acre of direct and counter-cyclical payments, 2002 Farm Act[1]



[1]Assumes national average payment yields for direct and counter-cyclical payments. Expected counter-cyclical payments are based on average 1991-2000 prices, except for peanuts, which are based on actual counter-cyclical payments in 2002-04.

Source: Compiled by USDA's Economic Research Service from the Farm Service Agency.

[9]Peanut base is an exception. Peanut base was designated separately from other commodities, but logic for peanuts is similar to the logic for other high-payment commodities—rice, cotton, and corn. Peanut base is very valuable, second only to rice for direct payments, a commodity with which it does not compete for land. Thus, a peanut planting history dominates all other alternatives. While peanut base was allocated separately from other commodities, a farmer with a history of peanut production had a strong incentive to retain sufficient cropland acreage to allocate base to historic peanut plantings.

dominates options 3 and 5. Indeed, rice and cotton base acres exceeded 2002 planted acres in several States and regions by a considerable margin. Conversely, producers who took advantage of the planting flexibility provided by the 1996 Farm Act and expanded or started to produce cotton were likely to have selected option 4 to increase cotton base.

A corollary of the high-payment rule is that it is almost always advantageous to trade low-payment commodity base acres—oats and barley—for higher paying soybean base acres to the extent the farm's 1998-2001 soybean plantings would allow. Thus, when either oats or barley constitutes a large share of a farm's PFC acres, options 3 and 5 dominate option 2.

Finding the Best Yield Designation Under Option 4

If a farmland owner selected option 4, base acres would equal the 1998-2001 average plantings of eligible crops on the farm. Direct payment rates per unit are fixed in the 2002 Act. While counter-cyclical payment rates are determined by market conditions, their maximum unit values are also fixed by the 2002 Act. Thus, the only decision variable facing the farmland owner under option 4 is the program yield designation for counter-cyclical payments, from the alternatives discussed earlier.

Evaluating the Base Updating Decision

After determining the best yield designation under option 4, the farmland owner compares the yield value with the value of the optimal designation under options 1, 2, 3, and 5. The greater of these two local maxima is the global maximum of the payment maximization choice problem.

Incentives to update base acres using option 4 depended primarily on the relationship between plantings in 1998-2001 and PFC acres. The larger the recent plantings of higher payment program crops, the greater the likelihood of choosing option 4 to update base acres. The incentive was particularly strong when the expansion was to high-payment crops, such as cotton. However, in regions where corn production expanded, farmers also had a strong incentive to update base acres.

Case Studies

An examination of three case studies will help address the rationale behind the updating decision. An indepth look at three counties in South Dakota illustrates county- and farm-level economic incentives of the base designation choice and is supported by an analysis of the updating decision in all counties in South Dakota. Next, the decision to update base for a single commodity—cotton—is analyzed. Lastly, we look at the updating decision for the Heartland region, where corn and soybeans dominate planting decisions.

South Dakota

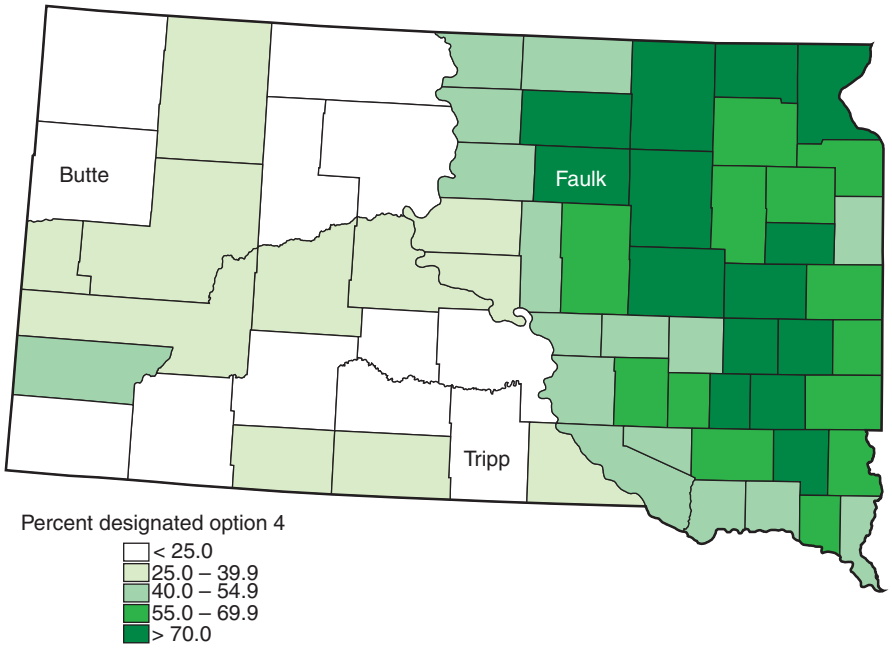
An analysis of base designation in South Dakota provides evidence of variations in incentives to update base acres by county and by farm (fig. 10). Statewide, 56 percent of base was updated—that is, designated for option 4. The Missouri River divides South Dakota roughly in half. About 63 percent of crop base east of the Missouri River was updated; west of the river, only 27 percent was updated. Though the east side is characterized by better soil and more rainfall, these natural endowments alone do not explain the large differences in observed updating rates.

County-level. Base decisions in three counties in South Dakota illustrate the difference in base designation incentives facing farmland owners and operators east and west of the Missouri River. Butte County, in the State's far west, designated the lowest percentage of option 4 base of any county in South Dakota as well as the highest percentage of option 1 base (table 3); Faulk County, in the northeastern part of the State, chose a high proportion of option 4 base and a very low proportion of option 1 base. Tripp County, in the south-central part of the State, is more of an intermediate example, where PFC augmentation (options 2, 3, and 5) dominated base designation.

Since 1986, farmers in Butte County have gradually reduced the acreage planted to program crops (fig. 11). Planting flexibility, partial after the 1990 Act and more complete following the 1996 Act, led to a reduction in barley, sorghum, corn, and wheat acreage. Oats, the least-valuable program payment crop, was the only crop to expand acreage. Updating base to align with recent

Figure 10

Percent of eligible acreage that updated base acreage to 1998-2001 plantings by county, South Dakota, 2002 Farm Act



Percent of base acres designated option 4, South Dakota

Share of acres designated option 4	Acres designated option 4	All base acres enrolled	Number of producers designating option 4	Number of producers designating base	Number of counties
Percent	—— *1,000 acres* ——				
Under 25.0	303	1,554	1,166	4,035	12
25.0 to 39.9	632	1,840	1,467	3,859	11
40.0 to 54.9	1,233	2,621	4,357	8,032	15
55.0 to 69.9	2,188	3,490	7,383	11,206	14
Over 70.0	3,507	4,455	7,946	10,517	14

Source: Compiled by USDA's Economic Research Service from the Farm Service Agency.

Table 3

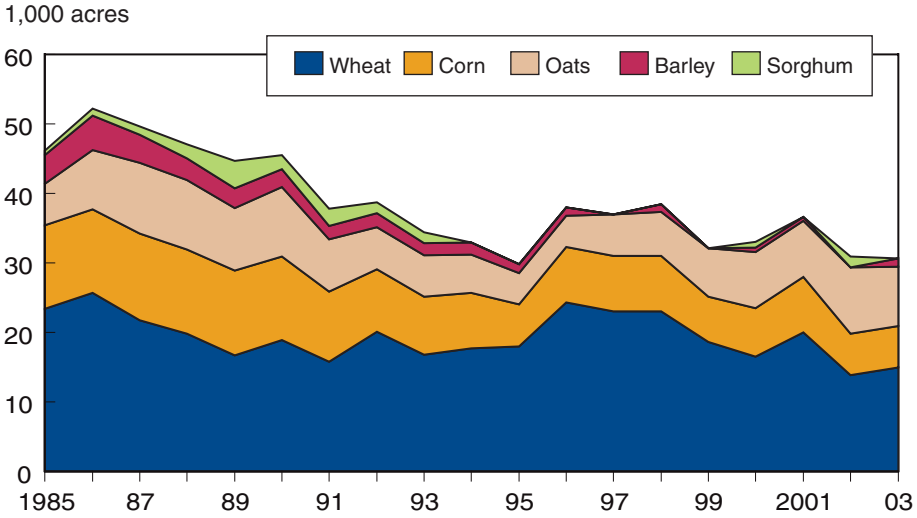
Base acres designations by five options, South Dakota, 2002 Farm Act

Region/County	Share of acres: Option 1 (keep PFC acreage)	Share of acres: Options 2, 3, and 5 (augment PFC acreage with oilseeds)	Share of acres: Option 4 (update to 1998-2001 plantings)
		Percent	
Statewide	10.3	33.4	56.3
East of Missouri River	3.7	33.5	62.8
West of Missouri River	40.1	33.0	26.9
Butte County	73.6	7.1	12.2
Tripp County	18.8	65.3	15.4
Faulk County	3.4	21.3	75.3

Source: Calculated by USDA's Economic Research Service from the Farm Service Agency.

Figure 11

Planted acres, Butte County, South Dakota, 1985-2003



Source: Compiled by USDA's Economic Research Service from the National Agricultural Statistics Service.

planting and yields would cause the county (viewed as single operation) to reduce its current program payments, so low levels of option 4 (12 percent) are not surprising. USDA's National Agricultural Statistics Service (NASS) reports no oilseed planting for Butte County in 1998-2001; consequently, choosing options 2, 3, and 5, which allow program participants to add oilseed base to current PFC acres, did not apply. In fact, the county preserved 74 percent of PFC acres under option 1. Butte County is representative of the shifts in acreage in the western Dakotas, Wyoming, and Montana. Total acreage planted to program crops in the region has declined and oilseeds are rarely planted; thus, the share of acres designated with options 1 and 2 is high, and relatively few acres were designated with option 3, 4, or 5.

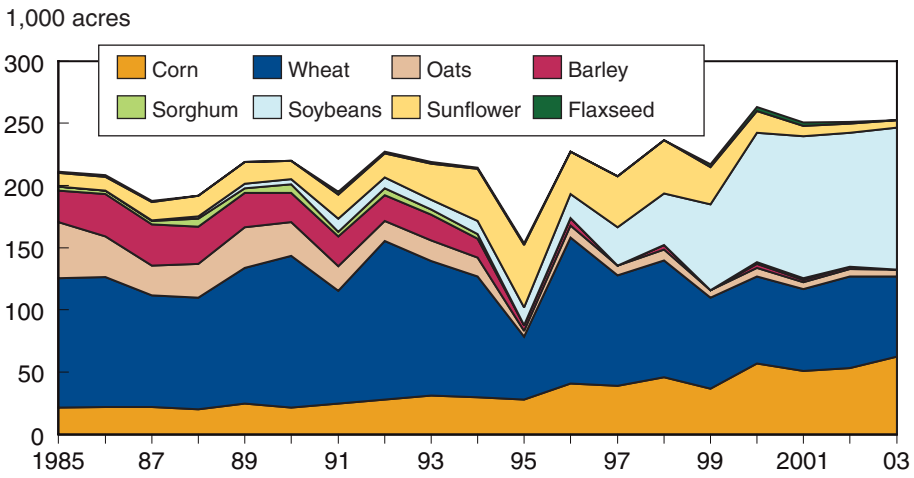
In contrast, acreage planted to program crops (including oilseeds) increased in Faulk County (fig. 12). Partial planting flexibility after 1990 allowed a shift of acreage from barley, oats, and sorghum to oilseeds, particularly sunflower seed.[10] Full planting flexibility allowed a rapid shift into soybeans and out of wheat and other noncorn feed grains. Corn acreage in the county doubled between 1994 and 2002. Farmers elected to update 75 percent of acreage base to 1998-2001 averages (option 4); yields were updated as well. Only 3 percent of the county's PFC acres were retained unchanged (option 1). On the balance of acres, farmland owners chose to add oilseeds or substitute oilseed base for lower payment oat or barley base.

Faulk County is representative of the large group of counties along the Missouri River in Kansas, Nebraska, South Dakota, and eastward into Minnesota and northwest Iowa where wheat, barley, and oats production shifted to corn and oilseed production. In part, this transformation stemmed from breeding innovations that enabled producers to grow both corn and soybeans profitably further north and west than before. For example, from the late 1970s until the late 1990s, average corn yields increased by over 60 percent in North Dakota and soybean yields increased by almost 50 percent; in contrast, the State's wheat yields increased by only 20 percent. The overall effect on the region has shifted the boundary of the area in which corn can be

[10]The James River and its tributaries flooded in spring 1995, causing the sharp drop in acreage that year, particularly for wheat.

Figure 12

Planted acres, Faulk County, South Dakota, 1985-2003



Source: Compiled by USDA's Economic Research Service from the National Agricultural Statistics Service.

grown profitably to the northwest in the last decade. Changes in commodity programs also helped effect the shift in crop mix: planting flexibility allowed farmers to switch out of oats or wheat to soybeans and to expand corn acreage.

In general, where cropping patterns shifted to include a higher payment mix of commodities—the benefits of base updating increased. Where cropping patterns shifted to a lower payment mix of commodities, the benefits of keeping PFC acres for base were higher.

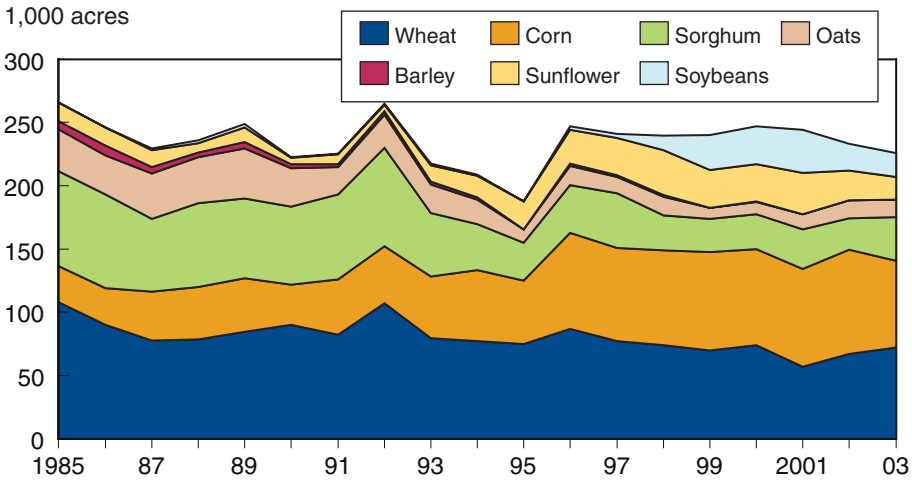
Tripp County is in central South Dakota near the border with northern Nebraska. It has the highest proportion (65 percent) of base acres in South Dakota designated under options 2, 3, or 5. Tripp County is west of the Missouri River but far enough east to get sufficient moisture to sustain sunflowers and soybeans. Total acreage planted to program crops (including oilseeds) has declined slightly since 1985 (fig. 13): this trend generally lessens the likelihood of updating (option 4). Planting flexibility, as well as new corn and oilseed varieties, allowed the county to shift acreage out of oats and barley and into corn and sunflowers. The shift accelerated after 1996: soybean acreage increased tenfold, corn expanded, and wheat acreage decreased. Corn program payment yields were relatively low in Tripp County, which reduced the incentive for many farmers to give up wheat base for corn base. Overall, the most attractive options for Tripp County farmland owners were options 2, 3, or 5, adding higher payment oilseed base and, where possible, switching from lower payment oat and barley base.

To determine whether generalizations about the factors influencing base designation decisions apply to all counties in South Dakota, it is necessary to estimate the payments in each county for each base designation option.

A county's direct payment amount for option 1 was derived by combining county-level data on endowments of PFC acreage and program payment yields, available from FSA with the direct payment values specified in the 2002 Farm Act. Calculating amounts for the other options requires information about acreage planted and "prevented from being planted" in 1998-

Figure 13

Planted acres, Tripp County, South Dakota, 1985-2003



Source: Compiled by USDA's Economic Research Service from the National Agricultural Statistics Service.

2001. The analysis that follows uses NASS data on planted acres and yields to construct county-level estimates of program payments for options 2, 3, 4, and 5. The estimate for option 4 is relatively straightforward: the 1998-2001 planting averages equate to the new base acreage. Estimating direct payments for options 2, 3, and 5 draws on the payment maximization hypothesis to determine which oilseeds to add to base and which nonoilseed crops to exclude from base (if any).

Butte County, which had no NASS oilseed acreage, has identical payment estimates for options 1, 2, 3, and 5: $660,000 (table 4). For option 4 the county's payment drops by about one-third to $450,000. Tripp County farmland owners maximize payments under options 3 and 5. At the PFC and NASS-observed yields, farms producing oilseeds in Tripp County maximized payments if sunflower and soybean base were added as long as lower payment oat base is displaced. Faulk County farmland owners maximized direct payments with option 4; payments under option 4 are roughly twice the value of payments under option 1. The ratio of the option 4 direct payment to the maximum payment of the other options represents the incentives confronting the base-designation decision for each county as a whole. If the county were a single farm with one decisionmaker, the decision to update base (to designate all acreage as option 4) would be determined by this ratio. If the ratio exceeded 1.0, all farmland owners in the county would update; if the ratio were less than 1.0, none would update.

Of course, each county has many farms; in fact, on average, South Dakota has 800 participating FSA farms and 570 participating (FSA) producers per county. Individual farms vary considerably in the base endowments and 1998-2001 planting histories of farms within a county. For example, some farms specialize in large-scale cash grain production, and others specialize in cow-calf operations with some minor feed grain acreage. This intracounty variation underscores the fact that our estimated payment ratio is the average for the county: perhaps no individual farm in the county shares this exact ratio.

Statewide. Based on these county-level data, we then statistically tested the relationship between the proportion of base acres in each county updated for 1998-2001 plantings (option 4) and the estimated payment ratio (see box, "Statistical Analysis of Base Updating in South Dakota"). We found that the higher the ratio, the greater the percentage of base acreage updated (fig. 14). A strong relationship was found between the decision to update and the ratio of the value of option 4 to the value of options 1, 2, 3, and 5. In fact, the estimates for Butte and Faulk Counties are close to the observed values, but the estimate for Tripp County is higher than the actual level of updating.

Statistical Analysis of Base Updating in South Dakota

The payment maximization hypothesis for base updating decisions was tested using county-level data for South Dakota. The share of program area in a county that updated base acres is hypothesized to be a function of an estimated payment ratio that represents the payment value of updating base acres under option 4 relative to the maximum payment value among the other base augmentation options. The higher the payment ratio, the higher the share of program area in the county that would be expected to have updated base acres.

Since the proportion of program area updated was used as the dependent variable, a logit regression procedure was used to avoid potential estimation problems with the limited range of the dependent variable. Results in equation 1 indicate a strong, significant positive relationship between the estimated payment ratio and the share of program acreage updated in a county. The nonlinear nature of a logit regression complicates interpretation of the estimated coefficients, since the coefficients measure the impact of a one-unit increase in the payment ratio on the "log of the odds of a given choice" (Studenmund). The equation's explanatory power of 71 percent of the observed variation is high, particularly given the cross-sectional nature of the data, the heterogeneity of farms within and across counties, and the fact that the estimated payment ratio does not account for acres prevented from planting in 1998-2001 that could be considered planted in the update option.

(1) Logit option 4 = -4.481 + 3.505 * payment ratio
(-12.57) (12.68)

where:

D = Proportion of base acres designated under option 4

Logit option 4 = Ln(D/(1- D))

Payment ratio = (Direct payments, option 4)/
(Maximum direct payments, options 1, 2, 3, 5)

Values in parentheses are "t values"

Adjusted R^2 = 0.711

Number of observations: 66

Table 4

Calculated value of direct payments for three counties in South Dakota, 2002 Farm Act[1]

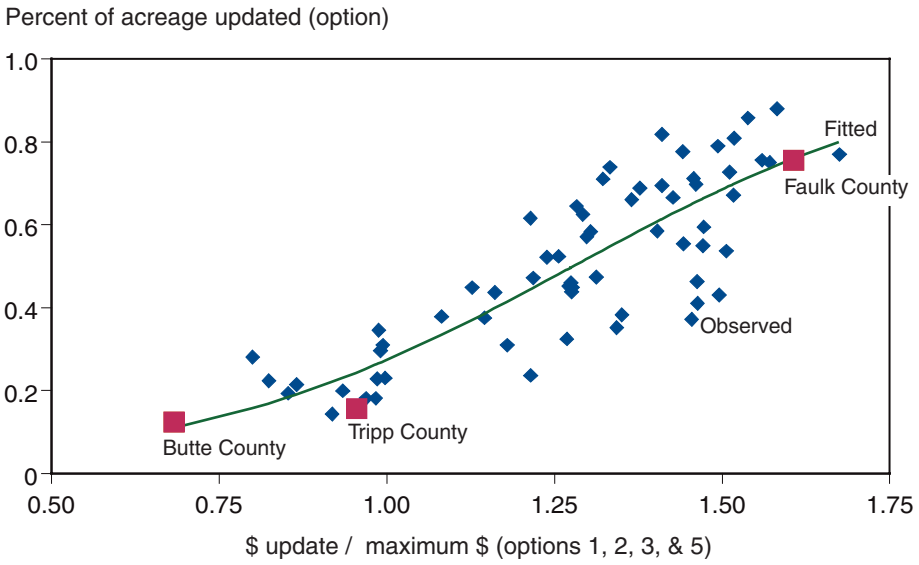
County	Payment values				Value of option 4 relative to maximum value of options 1, 2, 3, and 5
	Option 1 (keep PFC (PFC acreage acreage)	Option 2 (keep maximum (PFC acreage adding oilseeds)	Options 3 and 5 (replace some (PFC acreage with oilseeds)	Option 4 (update to 1998-2001 plantings)	
	$ million				*Percent*
Butte	0.66	0.66	0.66	0.45	68.1
Tripp	2.83	2.83	3.08	2.93	95.3
Faulk	1.60	2.21	2.36	3.16	160.5

[1]See pages 10-11 for definitions of base designation options.

Source: Calculated by USDA's Economic Research Service from the Farm Service Agency.

Figure 14

Proportion of base acres updated by county, South Dakota



Sources: Compiled by USDA's Economic Research Service from the Farm Service Agency and National Agricultural Statistics Service.

Cotton Updating

Cotton is one of the more lucrative sources of direct and counter-cyclical payments per base acre among the program crops. For payment purposes under the 2002 Farm Act, farmland owners opted to preserve and, if possible, expand cotton base. As noted previously, full planting flexibility under the 1996 Farm Act allowed farmers to expand cotton planting in the Southeast in the mid-to-late 1990s as eradication of the boil weevil increased the relative profitability of cotton. Cotton plantings in 1996-2000 in Georgia, for example, averaged about 50 percent higher than enrolled cotton PFC acres.

How well does the payment maximization hypothesis account for the observed updating of cotton base? Because cotton base has a higher payment value than most other competing base crops, it is possible to skip

the detailed payment calculations conducted for South Dakota counties and focus simply on how acreage planted to cotton and cotton yields changed in 1998-2001 relative to the county's historical endowment of cotton base and payment yields—that is, its cotton PFC acre payment quantity. Farmers in counties that increased cotton planting in 1998-2001 relative to their PFC cotton acres are likely to update a higher proportion of cotton base than counties that reduced cotton planting relative to PFC acreage (fig. 15) (see box, "Statistical Analysis of Cotton Updating Decisions"). As was the case in South Dakota, when farmers could increase higher payment (cotton) base, they did so. Otherwise they elected not to update and designated their former PFC acreage as base with oilseeds.

Statistical Analysis of Cotton Updating Decisions

For our analysis of the cotton updating decision, we used observed average county-level planting and yields in 1998-2001 and PFC acreage under the 1996 Farm Act to explain farmers' decisions to update cotton base acreage (select option 4 for cotton). The proportion of cotton base in a county that updated is hypothesized to be a function of a measure of cotton acres planted in 1998-2001 relative to PFC acres. A measure of yield change is included because when option 4 was designated, the landowner could update payment yields for counter-cyclical payments.

Since the proportion of cotton area updated is the dependent variable, a logit regression procedure is used to avoid potential estimation problems with the limited range of the dependent variable. Results are shown in equation 2, which indicates a strong, significant positive relationship between the cotton acres planted relative to PFC acres. The measure of yield change was also found to exert a significant influence on the updating decision. As noted in the box on statistical analysis of base updating, the nonlinear nature of a logit regression complicates interpretation of the estimated coefficients. The equation's explanatory power of 75 percent of the observed variation is high, particularly given the cross-sectional nature of the data and the heterogeneity of farms within and across counties.

(2) Logit cotton option 4 =
-4.954 + 9.130* (PFC area planted) + 0.342* (Yield change)
(-24.79) (33.72) (2.05)

where:

C = Proportion of cotton base acres designated option 4

Logit cotton option 4 = Ln(C/(1- C))

PFC area planted = Ave.(cotton acres planted, 1998-2001)/
(Ave.(cotton acres planted, 1998-2001) + PFC cotton acres)

Yield change = Ave.(cotton yield, 1998-2001)/(PFC cotton payment yield)

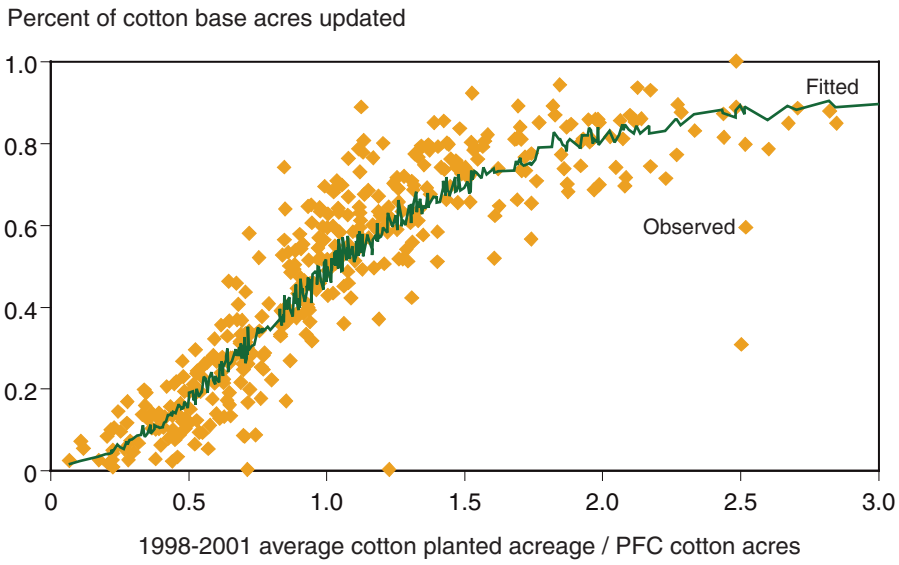
Values in parentheses are "t values"

Adjusted $R^2 = 0.754$

Number of observations: 421

Figure 15

Proportion of cotton base acres updated by county



Sources: Compiled by USDA's Economic Research Service from the Farm Service Agency and National Agricultural Statistics Service.

Updating in the Heartland: Corn Is King

Corn and soybeans are the predominant crops in the Heartland region, which includes all of Indiana, Illinois, and Iowa, most of Missouri, western Ohio, and adjoining parts of Kentucky, Nebraska, South Dakota and Minnesota (Heimlich). Corn is the primary crop as well as the highest paying crop base in the Heartland. The overall decision to update is largely determined by changes in corn acreage planted (see box, "Statistical Analysis of Updating Decisions in the Heartland"). However, changes in corn yields have a smaller, yet significant influence as well. Some landowners who had large yield increases may have elected to update base even when their plantings were similar to their PFC contract acres so that they could possibly benefit from higher counter-cyclical payments. As shown in figure 16, when corn production increased relative to PFC payment quantities, farmers elected to update base. Otherwise, they elected not to update and retained their former base acreage.

National-Level Signup Results

The relationship between the ranking of payments per base acre and changes in base acreage exhibited in South Dakota, in the Cotton Belt for cotton, and in the Heartland for corn provides a robust explanation of base updating decisions at the national level. As shown in table 2, the majority of producers elected not to update program base to 1998-2001 plantings, having determined that it was more lucrative to keep their PFC acreage as base acreage and add oilseed acreage when economically advantageous.

For the seven PFC crops, aggregate base acreage of 211.5 million acres is virtually unchanged from PFC acres under the 1996 Farm Act (table 5). The

Statistical Analysis of Updating Decisions in the Heartland

For our analysis of the updating decision in the Heartland, we used average corn plantings and yields in 1998-2001 to explain the overall decision to update base to option 4. We aggregated observed county-level information to National Agricultural Statistics Service crop reporting districts[1] to reduce the influence of smaller counties that had large changes in corn production.

Since the proportion of area updated is used as the dependent variable, a logit regression procedure is used to avoid potential estimation problems with the limited range of the dependent variable. Results are shown in equation 3, which indicates a strong, significant positive relationship between the corn acres planted relative to PFC acres. The measure of yield change was also found to exert a significant influence on the updating decision. As noted in the previous boxes, the nonlinear nature of a logit regression complicates interpretation of the estimated coefficients. The equation's explanatory power of 53 percent of the observed variation is high, particularly given the cross-sectional nature of the data and the fact that the dependent variable is all updating, not just corn updating. The Heartland is much more heterogeneous than the Cotton Belt or South Dakota, thus the lower explanatory power of the equation is expected.

(3) Logit option 4 =
-7.217 + 8.482 *(PFC corn area planted) + 2.202 *(Corn yield change)
(-7.84) (4.47) (4.82)

where:

D = Proportion of all base acres designated option 4

Logit option 4 = Ln(D/(1- D))

PFC corn area planted = Ave.(corn acres planted, 1998-2001)/
(Ave.(corn acres planted, 1998-2001) + PFC corn acres)

Corn yield change = Ave.(corn acres yield, 1998-2001)/
(PFC corn payment yield)

Values in parentheses are "t values"

Adjusted R^2 = 0.534

Number of observations: 50

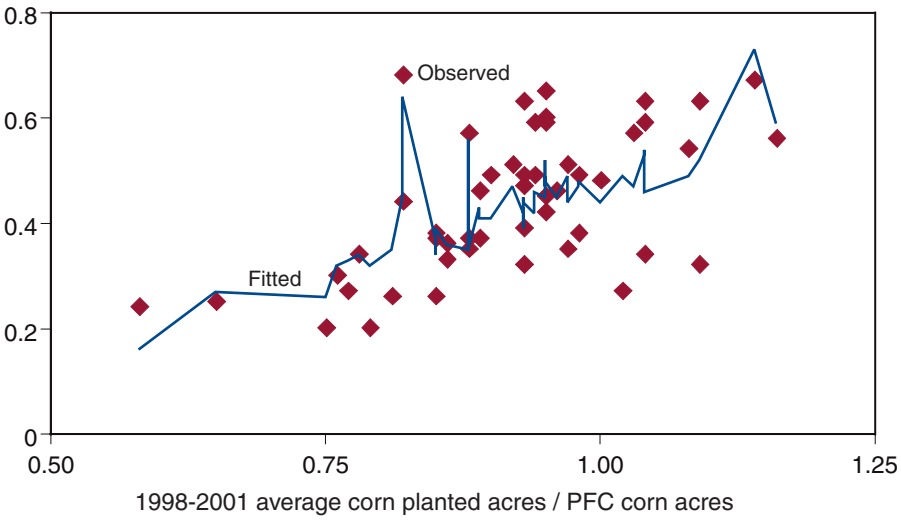
[1]Most States are divided into nine crop reporting districts (CRD). A CRD usually contains between 4 and 10 counties. The Heartland region has 50 CRDs.

composition of base acreage changed somewhat as wheat, sorghum, barley, and oats base declined by over 9 million acres while the more valuable rice, cotton, and corn base increased by a comparable amount. In addition, farmland owners enrolled about 58 million acres of oilseed base (including peanuts). Farmers elected to update over 40 percent of their corn and cotton base acres to 1998-2001 average plantings.

Cotton (46 percent), corn (41 percent), and soybean (56 percent) base had the largest percentage enrolled under option 4 (updated). The higher-than-

Figure 16

Proportion of base updated by crop reporting district, Heartland region



Sources: Compiled by USDA's Economic Research Service from the Farm Service Agency and National Agricultural Statistics Service.

Table 5

Comparison of program acres and yields: 2002 Farm Act and 1996 Farm Act

Crop	Contract acreage for 1996 Farm Act	2002 base acres for 2002 Farm Act: Not updated[1] (options 1, 2, 3, 5)	2002 base acres for 2002 Farm Act: Updated (option 4)[2]	2002 base acres for 2002 Farm Act: Total	Units	Yields: 1996 Farm Act	Yields: Direct and counter-cyclical payment yield (options 1, 2, 3, 5)	Yields: Direct payment (option 4)[2]	Yields: Counter-cyclical payment (option 4)[2]
	Million acres								
Wheat	78.44	55.09	21.11	76.20	Bushels	34.5	34.6	34.3	40.0
Rice	4.14	2.99	1.52	4.51	Pounds	4,814.1	4,754.0	4,938.8	5,848.5
Cotton	16.22	10.15	8.71	18.86	Pounds	605.0	620.6	585.4	660.2
Corn	81.63	51.47	36.39	87.86	Bushels	102.6	103.5	100.5	129.4
Sorghum	13.55	9.37	2.71	12.08	Bushels	57.0	56.6	55.9	62.9
Barley	11.05	7.35	1.44	8.79	Bushels	46.6	47.1	50.8	57.2
Oats	6.49	2.04	1.11	3.15	Bushels	50.6	46.6	51.4	55.7
Subtotal	211.53	138.45	72.99	211.44		NA	NA	NA	NA
Soybeans	0.00	23.32	30.23	53.55	Bushels	NA	30.2	31.2	37.1
Peanuts[3]	0.00	0	1.47	1.47	Pounds	NA		2,988.7	2,988.7
Sunflower	0.00	0.91	0.95	1.85	Pounds	NA	1,032.8	1,133.1	1,293.3
Canola	0.00	0.42	0.31	0.73	Pounds	NA	1,042.1	1,035.4	1,130.6
Other oilseeds	0.00	0.16	0.18	0.34		NA	NA	NA	NA
Total	211.53	163.25	104.66	269.38		NA	NA	NA	NA

NA = Not available

[1]Options 2, 3, and 5 allow for adding oilseed base.

[2]Option 4 allowed updating to 1998-2001 average acres planted and yields.

[3]Peanut data are for 2003 crop year.

Source: Calculated by USDA's Economic Research Service from Farm Service Agency.

average percentages for updating cotton and corn base reflect the higher per acre value of these types of base (see fig. 9). Since soybean base did not exist prior to 2002, producers had the option of retaining base acres from the 1996 legislation and adding soybean and other oilseed base as the residual to account for the remainder of their available cropland. Thus, the soybean base associated with options 1, 2, 3, and 5 does not reflect retention of prior soybean base; it represents the addition of oilseeds to account for total cropland planted in 1998-2001.

Farmland owners who experienced significantly higher yields in 1998-2001, relative to their program yields, had an additional incentive to update base acreage. Farmland owners who selected option 4 could then elect to update counter-cyclical yields to reflect actual 1998-2001 yields. About a third of the owners who updated to option 4 also updated CCP yields. Comparison of direct payment yields and counter-cyclical payment yields on updated farms (option 4) indicates that counter-cyclical payment yields increased by 10-30 percent over PFC program yields. On farms where corn planting increased during 1998-2001, a strong incentive existed to update yields. The average corn counter-cyclical payment yield is 29 percent greater than the direct payment yield.

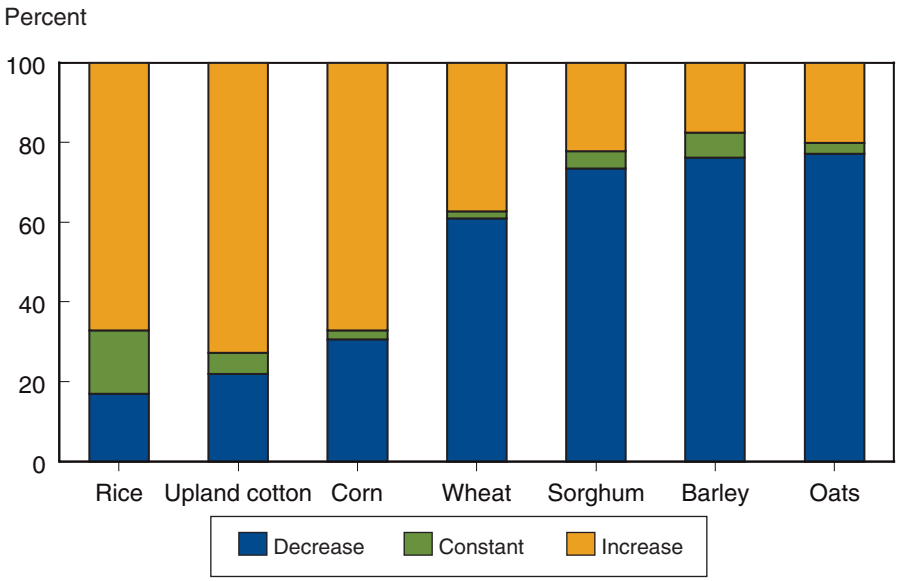
One reason that farmland owners chose not to update to 1998-2001 plantings is that during 1996-2001, farmers took advantage of the planting flexibility provisions of the 1996 Farm Act and switched to other crops or elected not to plant their entire PFC acres. Nationally, planted acreage of wheat, corn, grain sorghum, barley, oats, upland cotton, and rice averaged only 82 percent of PFC acres in 2001 (see table 5). Those who "underplanted their base" in 1998-2001 would have given up the direct and counter-cyclical payments associated with acreage that was not planted to covered crops if they had elected option 4. This effect was observed in Butte County, South Dakota.

The relationship between the ranking of payments per base acre and changes in the base acreage is robust across measures. For example, consider the proportions of counties that decreased, kept constant, or increased the base acreage of a particular (PFC) crop as a result of the base designation requirement in the 2002 Farm Act (fig. 17). The lowest proportion of counties decreasing base acres for an individual commodity was found among those counties with the highest valued per acre PFC crops under the 1996 Act. Counties with rice PFC acres tended to have the lowest amount of updating. Alternatively, counties with low-valued oats PFC acres accounted for the highest share of counties' decreasing oats base, 78 percent. The share of counties' decreasing base acreage (by PFC crop) varies inversely with crop payments per acre.

Base acres for the seven commodities that had received PFC payments could only be increased by choosing option 4, and then only if a farm had actually increased its planted acreage of a specific crop in 1998-2001 relative to its PFC acres. Planting history for oilseeds could be used to add base under options 2, 3, and 5. It has been shown that changes in the acreage planted of relatively valuable commodity base (rice, cotton, corn) is the primary determinant of updating base to option 4. Thus, direct and counter-cyclical payment base for PFC crops can exceed PFC acres only

Figure 17

Percent of counties increasing or decreasing base acres by commodity, 2002



Sources: Compiled by USDA's Economic Research Service from the Farm Service Agency and National Agricultural Statistics Service.

by updating.[11] Options 3 and 5 allowed a farm to switch PFC acreage to oilseed base acres to the extent that the farm's planting history allowed. Thus, it was possible to reduce PFC acreage endowments for less valuable PFC crops, such as oats and barley. Finally, one could elect to hold PFC acreage constant by designating the base acres under options 1 or 2.

[11]There are two exceptions to this statement. First, farms that were eligible to enroll for PFC payments in 1996, but choose not to, could have designated base under the 2002 Farm Act. Second, land that had been enrolled in the Conservation Reserve Program (CRP) at the time of PFC enrollment that came out of the CRP in 2002 could be enrolled in 2002/03. Both cases allow for an increase in base acres relative to PFC acres; however, the magnitudes involved were very small and do not significantly influence the result reported in this section.

Influence of Base Updating on 2003 Planting Decisions

Updating of base acres allowed some farmland owners to switch their base to higher per acre payment crops of peanuts, cotton, rice, and corn. Plantings of higher payment valued crops under the 2002 Act may be expected to more closely reflect base acres for those crops if farmers view planting base acres to the program crop as a means of building or protecting base for future updating opportunities. Alternatively, if farmers do not view payments as being linked to production or expected future payments, plantings are more likely to be based on expected market returns.

In 2003, area planted to direct and counter-cyclical payment program crops was almost 95 percent of base acres (table 6).[12] On this basis, one could argue that plantings are linked to base acreage. However, this relatively high percentage of base planted largely reflects the addition of oilseed base to the total. An examination of the share of base planted to the seven former PFC crops finds that about 84 percent of base acreage associated with the PFC commodities was planted to them in 2003, while 137 percent of oilseed base acreage (excluding peanuts) was planted to oilseeds.

Further disaggregation of the base planted at the county level reveals an even weaker link between base designated under the 2002 Farm Act and planted acreage. The continued use of planting flexibility is best illustrated by comparison of base and plantings for cotton and soybeans in 2003 (figs. 18 and 19).[13,14] For example, as discussed previously, upland cotton base increased in 2002 as producers who had taken advantage of planting flexibility and agronomic advances to expand cotton planting updated their designated base to higher valued cotton, while those farms that reduced or discontinued cotton production retained cotton base acres. This updating allowed farmers with expanded cotton plantings in 1998-2001 to align direct and counter-cyclical payments with recent higher production. However, in

[12]At the time that this analysis was conducted, the most recently available county-level planting data was for 2003.

[13]If individual farm-level data were available, this relationship would be even weaker.

[14]Additional maps comparing share (percent) of base acres planted in 2003 are available at *www.ers.usda.gov/data/baseacres/*

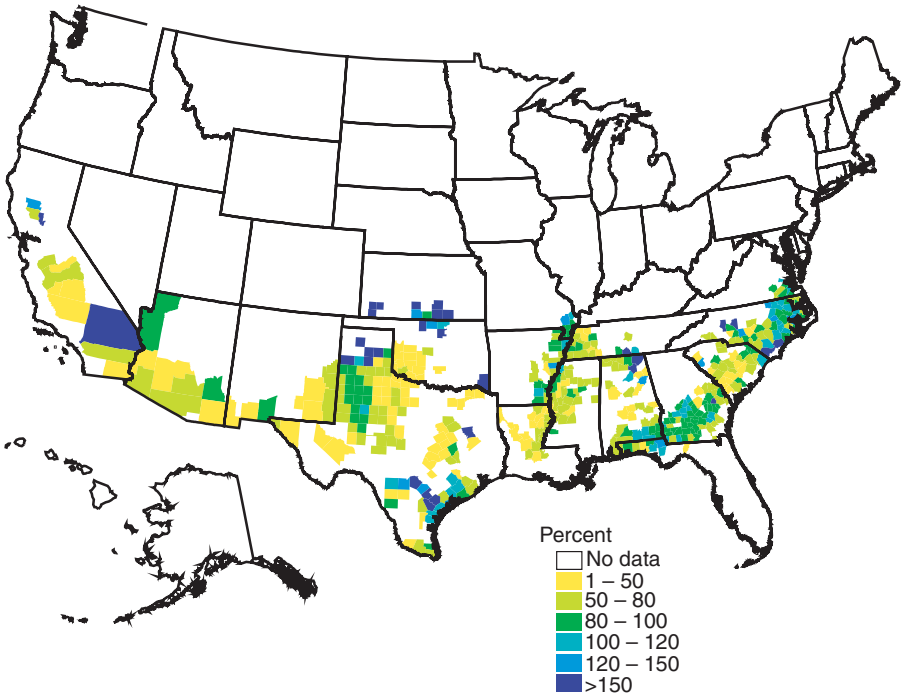
Table 6
Base acres and actual plantings, 2003

Crop	Actual plantings	Base acres	Share of base planted
	Million acres		*Percent*
Wheat	62.1	76.1	81.7
Rice	3.0	4.5	66.9
Cotton	13.3	18.6	71.4
Corn	78.7	87.7	89.8
Sorghum	9.4	12.1	77.9
Barley	5.3	8.8	60.8
Oats	4.6	3.1	146.1
Soybeans	73.4	53.3	137.8
Sunflower	2.3	1.9	126.3
Canola	1.1	0.7	148.7
Other oilseeds	0.0	0.3	0.1
Peanuts	1.3	1.5	90.2
Total	254.7	268.6	94.8

Sources: Compiled by USDA's Economic Research Service from the Farm Service Agency and the National Agricultural Statistics Service.

Figure 18

Cotton plantings relative to 2002 Farm Act cotton base acres, by county, 2003



Percent of upland cotton base acres planted, 2003

Share of base acres planted	Planted acres	PFC acres	Share of base acres planted (avg.)	Number of counties
Percent	*—— 1,000 acres ——*		*Percent*	
1 to 50	1,191	3,564	33.4	109
50 to 80	4,396	6,576	66.8	151
80 to 100	5,408	6,014	89.9	107
100 to 120	1,520	1,426	106.6	46
120 to 150	275	208	131.8	16
Over 150	229	87	263.1	30

Note: The graduated color classes used in the maps are represented in the map legend by break values for each range and, thus, seem to have overlapping numbers. For example, the range “50 to 80” is from 50.1 up to 80.0 and the range “80 to 100” is from 80.1 up to 100.0.

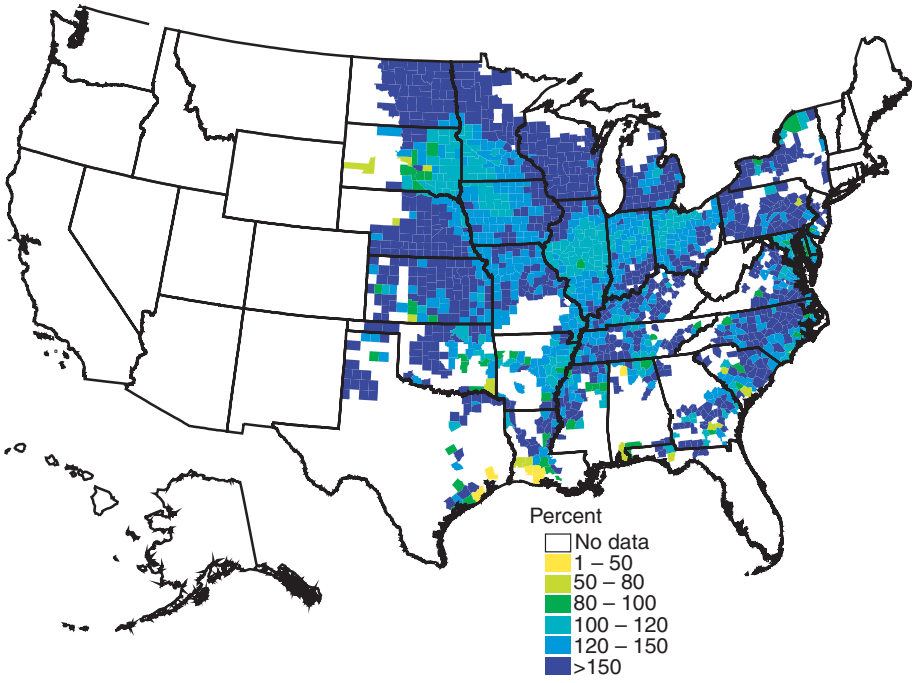
Sources: Compiled by USDA’s Economic Research Service from the Farm Service Agency and the National Agricultural Statistics Service.

2003, 13.3 million acres were planted to upland cotton, down 2.2 million acres from 2001. In 367 of the 459 counties that report county-level cotton plantings, base acres exceed planted acreage by a total of about 5.2 million acres. In the remaining 92 cotton counties, planted acres exceed base by 0.3 million acres.

The case for soybean producers is different. In designating base under the 2002 Farm Act, many soybean producers did not designate the full extent of 1998-2001 soybean plantings as base. These producers selected higher valued base whenever possible. Thus, in 2003, in 95 percent of the counties that report soybean plantings, soybean plantings exceeded soybean base.

Figure 19

Soybean plantings relative to 2002 Farm Act soybean base acres, by county, 2003



Percent of soybean base acres planted, 2003

Share of base acres planted	Planted acres	PFC acres	Share of base acres planted (avg.)	Number of counties
Percent	*—— 1,000 acres ——*		*Percent*	
1 to 50	46	117	39.3	7
50 to 80	45	70	64.4	16
80 to 100	1,016	1,058	96.0	50
100 to 120	19,764	17,663	111.9	227
120 to 150	28,573	21,577	132.4	474
Over 150	23,735	11,935	198.9	827

Note: The graduated color classes used in the maps are represented in the map legend by break values for each range and, thus, seem to have overlapping numbers. For example, the range “50 to 80” is from 50.1 up to 80.0 and the range “80 to 100” is from 80.1 up to 100.0.

Sources: Compiled by USDA’s Economic Research Service from the Farm Service Agency and the National Agricultural Statistics Service.

Conclusions

The 2002 Farm Act provided farmland owners the opportunity to update commodity program base acres and program yields, which are used to determine direct and counter-cyclical payments for the period 2002-07. Findings suggest that decisionmakers viewed the update decision in economic terms related to those payments: program participants selected the update alternative that resulted in the greatest expected flow of direct and counter-cyclical payments.

The majority of farmland owners chose not to update base to 1998-2001 plantings. Most farmland owners elected to keep production flexibility contract (PFC) acreage under the 1996 Farm Act as their base acres, to augment PFC acres with oilseeds, or to exchange existing PFC acres for base for soybeans or other oilseeds. Selected State, regional, and national data suggest that the base designation decision was influenced primarily by the desire to maximize direct and counter-cyclical payments under the farm program. If updating base provided a greater flow of these payments than not updating, program participants updated base acres. For example, updating decisions in the Heartland reveal that farmland owners who expanded corn production in 1998-2001 had a tendency to update to this higher payment commodity. Conversely, landowners of farms that maintained or reduced plantings of corn generally elected to designate their PFC acreage as base acres rather than give up the more valuable payment acres. Similarly owners of farms with other high-payment commodity base acres, such as rice and cotton, held on to those base acres and, whenever possible, expanded them. And owners of farms with low-payment commodity base acres, such as oats and barley, switched to higher payment commodity base acres whenever possible.

Findings do not support an alternative hypothesis that program participants wanted to align base acres and payment yields (and thus payments) to current plantings and production. In many cases, participants elected crop base acres that differed substantially from current crop production because payments were higher. Additionally, in many areas, 2001 plantings differed from PFC acreage and 2003 plantings differed from base acres.

These results suggest, in general, that maximizing direct and counter-cyclical payments was more important to farmland owners making base designation decisions than aligning base to current or recent plantings. The choice of base acres is a distinctly different economic decision than that underlying year-to-year planting choices. Further, the lack of a strong link between program acres (base or PFC) and year-specific plantings is consistent with the proposition that direct and counter-cyclical payments are largely perceived as cash transfers that are separate from commodity production decisions and output levels.

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Appendix table: Crop Acreage Bases and Program Payment Yields, 1981 Through 2002 Farm Acts				
Farm legislation	**Crop acreage base**—A farm's crop-specific acreage eligible to enroll in commodity programs	**Program payment yield**—Crop-specific yield per acre established for a farm based on agricultural legislation and administrative rules	**Applicable commodities**	**Determination of payments**—The farm program payment yield combined with a portion of enrolled acreage is used to determine selected farm program payments.
1981 Farm Act	The crop acreage base for a program crop in 1982-85 equaled the previous year's plantings of that crop for harvest, including acreage idled under annual programs and acreage prevented from plantings. At the discretion of the Secretary, base could be computed using plantings for harvest in the 2 preceding crop years.	Farm program payment yields established for 1982-85 reflected various combinations of program yields established under prior legislation, proven yields, and administratively determined yields. Payment yields for wheat and feed grains were the previous crop year's established yield for the farm, adjusted by the Secretary to provide a fair and equitable yield. In particular, proven yields based on actual production were allowed if higher than the established farm program yield. For cotton and rice, the program yields were based on the actual yield per harvested acre for the 3 preceding years, with adjustments for abnormal yields resulting from natural disasters or other conditions beyond the control of the producer.	Wheat, corn, sorghum, barley, oats, upland cotton, and rice.	Deficiency payments for the 1982-85 crop years equaled the payment rate times the farm program acreage times the farm program payment yield. The payment rate was the difference between the target price and the higher of the national loan rate or the national weighted average market price for the first 5 months of the crop year. As implemented, the individual farm program acreage was the acreage planted on the farm for harvest within the permitted acreage base.
1985 Farm Act, as amended	The crop acreage base for crop years 1986-90 equaled the average of the acreage planted and considered planted to the crop for harvest on the farm during the 5 preceding crop years. For upland cotton and rice, years with no plantings could be omitted, except their crop bases could not exceed the average acreage planted	The farm program payment yield for crop years 1986-87 was the average program yield for crop years 1981-85, excluding the years with the highest and lowest yield. If no crop was produced or no program yield was established on the farm during any of	Wheat, corn, sorghum, barley, oats, upland cotton, and rice.	Deficiency payments equaled the deficiency payment rate times the farm program yield times the payment acreage (the amount of land planted to the program commodity after meeting any acreage reduction program requirements). Except for 0/92 acres, payment

Appendix table: Crop Acreage Bases and Program Payment Yields, 1981 Through 2002 Farm Acts–Continued

Farm legislation	**Crop acreage base**—A farm's crop-specific acreage eligible to enroll in commodity programs	**Program payment yield**—Crop-specific yield per acre established for a farm based on agricultural legislation and administrative rules	**Applicable commodities**	**Determination of payments**—The farm program payment yield combined with a portion of enrolled acreage is used to determine selected farm program payments.
1985 Farm Act, as amended–*continued*	and considered planted in the preceding 2 crop years. For program purposes, corn and grain sorghum bases were combined, as were barley and oats bases. Crop acreage bases were reduced by the acreage enrolled in the Conservation Reserve Program multiplied by (1) the farm's total base acreage divided by (2) the farm's total cropland acreage. Acreage considered planted included: 1) any reduced or diverted acreage under annual programs; 2) acreage producers could not plant due to natural disaster or other conditions beyond the control of the producer; 3) the difference between permitted acreage and acreage planted to the program crop, if such acreage was devoted to conserving uses or specified industrial or experimental nonprogram crops; and 4) any acreage on the farm which the Secretary determined was necessary to establish a fair and equitable crop base.	those 5 years, then the farm program yield was based on average program yields for similar farms in the area. Program payment yields for 1988-90 were then frozen at 1986-87 levels.		acreage was the acreage actually planted. Payment acreage could not exceed permitted acreage (the difference between the base acreage and the acres idled under the acreage reduction program and paid land diversion). Producers had the option of participating in acreage diversion programs (50/92 and 0/92 programs) in which they could underplant their permitted acres by more than 8 percent and still, under some conditions, receive deficiency payments on a portion of the underplanted acreage. Limited planting flexibility in 1989 allowed the planting of soybeans and sunflowers on a portion (10-25 percent) of program crop permitted acreage, with a loss of deficiency payments for acreage switched. A similar program in 1990 allowed soybean plantings on up to 25 percent of program crop permitted acreage.

Appendix table: Crop Acreage Bases and Program Payment Yields, 1981 Through 2002 Farm Acts–Continued

Farm legislation	**Crop acreage base**—A farm's crop-specific acreage eligible to enroll in commodity programs	**Program payment yield**—Crop-specific yield per acre established for a farm based on agricultural legislation and administrative rules	**Applicable commodities**	**Determination of payments**—The farm program payment yield combined with a portion of enrolled acreage is used to determine selected farm program payments.
1990 farm legislation, as amended	For wheat, corn, sorghum, oats, and barley, the crop acreage base equaled the average of the acreage planted and considered planted for harvest on the farm for the 5 preceding crop years. For program purposes, corn and grain sorghum bases were combined, as were barley and oats bases. For upland cotton and rice, the crop acreage base equaled the average of the acreage planted and considered planted for the 3 preceding crop years. However, if upland cotton and rice producers did not participate in the 1989 and 1990 programs, the crop acreage base for 1991 was the average of the acreage planted and considered planted for the 5 preceding crop years, excluding the years in which no crop was planted, but not greater than the average of the preceding 2 years. For those that did not participate in 1990 and 1991 programs, a similar calculation procedure was used for 1992 crop acreage bases. The sum of the crop acreage bases could not exceed the cropland on the farm, except where double cropping was practiced. Double cropping must have been practiced at	Program payment yields for 1991-95 were continued at 1990 levels.	Wheat, corn, sorghum, barley, oats, upland cotton, and rice.	Generally, payment acres for a producer were the acres planted up to a producer's maximum payment acres. Maximum payment acres equaled a producer's base acreage less reduced or idled acres less normal flex acres (15 percent of the base). Producers were allowed to plant up to 25 percent of the crop acreage base to any commodity, except fruits and vegetables, potatoes, dry edible beans, peas, and lentils, without losing any of the crop's acreage base. The 1990 Budget Act reduced the acreage on which deficiency payments would be paid by 15 percent of the crop acreage base. This was called normal flex acreage (NFA). The remaining 10 percent was called optional flex acreage (OFA). Deficiency payments were reduced for OFA not planted to the program commodity. Producers had the option of under-planting their maximum payment acres by more than 8 percent and

Appendix table: Crop Acreage Bases and Program Payment Yields, 1981 Through 2002 Farm Acts–Continued

Farm legislation	**Crop acreage base**—A farm's crop-specific acreage eligible to enroll in commodity programs	**Program payment yield**—Crop-specific yield per acre established for a farm based on agricultural legislation and administrative rules	**Applicable commodities**	**Determination of payments**—The farm program payment yield combined with a portion of enrolled acreage is used to determine selected farm program payments.
1990 farm legislation, as amended—*continued*	least 3 of the 5 preceding crop years for which the base was calculated in order to be eligible for this exception.			receiving deficiency payments on a portion of the underplanted acres (0/92). Producers had to devote the underplanted acres to conservation uses or approved nonprogram crops. A minimum deficiency payment rate under this program was guaranteed to be no less than the projected deficiency payment rate. The Omnibus Budget Reconciliation Act of 1993 provided for budget savings by changing the 0/92 provisions to 0-85/92.
1996 Farm Act	Commodity base acreage was replaced with contract acreage that was generally fixed for 1996 through 2002 crop years. Contract acreage generally equaled the base acreage that would have existed for the 1996 crop year, and included land enrolled in acreage reduction programs for any of the crop years 1991 through 1995, land considered planted under program rules (certified acreage), and land that had been enrolled in the CRP with an associated crop acreage base.	Program payment yields for 1996-2002 at 1995 levels.	Wheat, corn, sorghum, barley, oats, upland cotton, and rice.	Production flexibility contract (PFC) payments equaled the PFC payment rate times the PFC payment quantity. The payment rate depended on budget allocations specified in the legislation. The payment quantity was 85 percent of the farm's contract acreage multiplied by the farm's program yield. Production was not required to receive PFC payments.

Appendix table: Crop Acreage Bases and Program Payment Yields, 1981 Through 2002 Farm Acts–Continued

Farm legislation	**Crop acreage base**—A farm's crop-specific acreage eligible to enroll in commodity programs	**Program payment yield**—Crop-specific yield per acre established for a farm based on agricultural legislation and administrative rules	**Applicable commodities**	**Determination of payments**—The farm program payment yield combined with a portion of enrolled acreage is used to determine selected farm program payments.
1996 Farm Act—*continued*				Planting of fruits and vegetables (excluding mung beans, lentils, and dry peas) on contract acres was prohibited unless the producer or the farm had a history of planting fruits and vegetables, but payments were reduced acre-for-acre on such plantings. Double cropping of fruits and vegetables was permitted without loss of payments if there were a history of such double cropping in the region. Wild rice was added to the list of restricted crops in the 2000 Agricultural Appropriations Act.
2002 Farm Act, as amended	The 2002 Farm Act required eligible farmland owners to designate base acres that, along with program yields, determine direct and counter-cyclical payments. Farmland owners had to select one of five options for designating base acres on their farm, including the addition of soybeans and other oilseeds: 1) Set base acres equal to the contract acreage that would have been used to make 2002 PFC payments (PFC acreage).	Direct payment yields were the same as the payment yields that would have been used to make PFC payments under the 1996 Act. For soybeans and other oilseeds, direct payment yields are based on 1998-2001 production histories, adjusted to reflect 1981-85 yields. If landowners chose to update their farm's base acres to 1998-2001 plantings, they could also set	Wheat, corn, sorghum, barley, oats, upland cotton, rice, soybeans, peanuts, and other oilseeds (sunflower seed, canola, rapeseed, safflower, mustard seed, flaxseed, crambe, and sesame).	Production of a specified commodity is not required in order to receive direct payments or counter-cyclical payments. Payment acres are equal to 85 percent of the base acres. Base acre planting restrictions for fruits, vegetables, and wild rice were continued.

Appendix table: Crop Acreage Bases and Program Payment Yields, 1981 Through 2002 Farm Acts–Continued

Farm legislation	**Crop acreage base**—A farm's crop-specific acreage eligible to enroll in commodity programs	**Program payment yield**—Crop-specific yield per acre established for a farm based on agricultural legislation and administrative rules	**Applicable commodities**	**Determination of payments**—The farm program payment yield combined with a portion of enrolled acreage is used to determine selected farm program payments.
2002 Farm Act, as amended — *continued*	2) Set base acres equal to PFC acreage, plus the average oilseed acreage planted in 1998-2001, up to the base acreage maximum (total area planted or prevented from planting to eligible crops in 1998-2001). 3) Set base acres equal to PFC acreage plus oilseeds, but with a PFC offset. This option allowed farmland owners to add the full amount of 1998-2001 average oilseed plantings but reduced base acres for PFC crops. 4) Set base acres equal to the average acreage planted and prevented from planting in 1998-2001. 5) Set base acres equal to PFC acreage, and add oilseed base by reducing PFC acreage. This option allowed farmland owners to add some, but not all 1998-2001 average oilseed plantings.	their counter-cyclical payment yields using one of the following methods: 1) Keep PFC yields as CCP yields. 2) Set CCP yields equal to the PFC yields plus 70 percent of the difference between the PFC and 1998-2001 average yields. 3) Set CCP yields equal to 93.5 percent of 1998-2001 average yields.		

Legislation sources: Agriculture and Food Act of 1981 (P.L. 97-98; December 22, 1981); Food Security Act of 1985 (P.L. 99-198; December 23, 1985); Technical Corrections to Food Security Act of 1985 Amendments (P.L. 99-253; February 28, 1986); Food Security Improvements Act of 1986 (P.L. 99-260; March 20, 1986); Disaster Assistance Act of 1988 (P.L. 100-387; August 11, 1988); Disaster Assistance Act of 1989 (P.L. 101-82; August 14, 1989); Omnibus Budget Reconciliation Act 1989 (P.L. 101-239; December 19, 1989); Omnibus Budget Reconciliation Act 1990 (P.L. 101-508; November 5, 1990); Food, Agriculture, Conservation, and Trade Act of 1990 (P.L. 101-624; November 28, 1990); Omnibus Budget Reconciliation Act of 1993 (P.L. 103-66; August 10, 1993); Federal Agriculture Improvement and Reform Act of 1996 (P.L. 104-127; April 4, 1996); Farm Security and Rural Investment Act of 2002 (P.L. 107-171; May 13, 2002); and Consolidated Appropriations Resolution, 2003 (P.L. 108-7, February 20, 2003).

Sources: Bowers et al and Johnson et al. (1981 Act); Glaser (1985 Act); Pollack and Lynch (1990 Act); Nelson and Schertz (1996 Act); and Young (2002 Act). USDA, *ASCS Commodity Fact Sheet*, various commodities and years.