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# Participation in Conservation Programs by Targeted Farmers: Beginning, Limited-Resource, and Socially Disadvantaged Operators' Enrollment Trends

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# Participation in Conservation Programs by Targeted Farmers

## Beginning, Limited-Resource, and Socially Disadvantaged Operators' Enrollment Trends

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### Abstract

Beginning, limited-resource, and socially disadvantaged farmers make up as much as 40 percent of all U.S. farms. Some Federal conservation programs contain provisions that encourage participation by such “targeted” farmers and the 2008 Farm Act furthered these efforts. This report compares the natural resource characteristics, resource issues, and conservation treatment costs on farms operated by targeted farmers with those of other participants in the largest U.S. working-lands and land retirement conservation programs. Some evidence shows that targeted farmers tend to operate more environmentally sensitive land than other farmers, have different conservation priorities, and receive different levels of payments. Data limitations preclude a definitive analysis of whether efforts to improve participation by targeted farmers hinders or enhances the conservation programs’ ability to deliver environmental benefits cost effectively. But the different conservation priorities among types of farmers suggest that if a significantly larger proportion of targeted farmers participates in these programs, the programs’ economic and environmental outcomes could change.

**Keywords:** Conservation programs, Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), Wetlands Reserve Program (WRP), beginning farmers, limited-resource producers, socially disadvantaged farmers and ranchers

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## Summary

Targeted farmers include those with 10 or fewer years of experience, farmers with limited farm sales and income, and farmers belonging to segments of the population that have historically been subject to discrimination, such as African American, American Indian, Alaskan Native, Hispanic, Asian American, or Pacific Island farmers. Targeted farmers make up as much as 40 percent of all U.S. farms, and, although many participate in conservation programs, targeted farmers typically have not participated in government agricultural programs at the same rate as other farmers. To help offset potential barriers to participation, USDA offers targeted farmers more favorable payment and enrollment terms in conservation programs than are available to other farmers.

### What Is the Issue?

Farm legislation in both 2002 and 2008 encouraged targeted farmers to participate in conservation programs by making them eligible for more favorable payment and enrollment terms than other farmers received. Such Federal provisions can alter program outcomes in unintended ways if targeted farmers adopt different conservation practices, address different environmental needs, or operate land that is more or less environmentally sensitive than the land operated by other farmers. Targeting certain farmer types could result in tradeoffs between environmental performance, cost-effective delivery of program benefits, and improved access to Federal conservation programs. This report addresses this issue by examining participation patterns in the Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), and Wetlands Reserve Program (WRP) to provide information on the types of farmers who enroll, the geographic distribution of participants, the types and costs of conservation practices they implement, the resource issues they address, the natural resource characteristics associated with their farms, and whether different types of farmers participate in different ways. Participation rates are measured where possible based on both the number of farms and acres enrolled in conservation programs, as these two measures can provide very different pictures of targeted farmer participation. Those three conservation programs account for 74 percent of authorized conservation spending in the 2008 Farm Act.

### What Did the Study Find?

During 2004-07, targeted farmers participated differently in conservation programs than did other farmers. While not definitive, evidence shows that targeted farmers tended to operate more environmentally sensitive land than other farmers, had different conservation priorities, and received different levels of payments. Those differences suggest that economic and environmental outcomes could change if the proportion of targeted farmers enrolled in the programs increases significantly.

## ***Enrollment Patterns***

Beginning and limited-resource farmers—two of the three targeted-farmer groups—were less likely to participate in EQIP than was the U.S. farm population as a whole (data on socially disadvantaged farmer participation in EQIP were not available). These two farmer types operated about 27 percent of all farms in 2006 but held 12 percent of EQIP contracts. This participation trend was observed in nearly every region of the country, suggesting that policies that make it easier for these farmers to enroll could increase participation. One new policy aimed at encouraging participation, however, is likely to have little effect. The 2008 Farm Act requires that 5 percent of EQIP funds be set aside annually for beginning farmers, but beginning farmers have typically received more than 10 percent of EQIP payments annually in recent years.

Like their participation patterns in EQIP, targeted farmers enrolled disproportionately fewer farms in conservation programs that retire land from production. Twenty-two percent of farms operated by all three groups of targeted farmers were enrolled in the CRP and WRP, even though they operate 31 percent of all farms. A different pattern emerges, however, when the amount of enrolled acreage is evaluated instead of the number of enrolled farmers: Targeted farmers enrolled disproportionately more acreage in CRP and WRP than other farmers. Targeted farmers operated 15 percent of farmland acres in 2007 but controlled 17 percent of acres enrolled in these programs.

## ***Environmental Problems and Priorities for Treatment***

Beginning farmers in the Delta region (the only area for which we could analyze soil data) who participated in EQIP tended to enroll more highly erodible land than other participating farmers. This trend suggests that conservation efforts by these farmers could provide more program benefits than efforts by other farmers. The available data, however, make it difficult to determine with certainty if targeting these farmers would increase program benefits because the characteristics of program participants may not represent this farmer group as a whole. If, in general, few beginning farmers operate highly erodible land (and the few that do have “self-selected” and have already chosen to enroll), targeting more of these farmers for enrollment may not provide more conservation benefits than are provided by other farmer types.

Conservation priorities of farmers participating in conservation programs differ by farmer type. Beginning and limited-resource farmers enrolled in EQIP addressed livestock forage and health needs and plant productivity/quality issues more often than did other farmer types. And although both beginning and limited-resource farmers participating in EQIP were more likely to farm closer to quality-impaired waters, the limited-resource farmers were less likely to address water quality problems. Several possible reasons may explain these tendencies. First, limited-resource farmers may face financial or other constraints in adopting practices that might improve water quality. Second, these farmers may derive more direct benefits by focusing on other issues (like improving plant health and vigor). Finally, limited-resource farmers tend to operate smaller farms that are not subject to the same regulatory requirements facing larger farm operators who use EQIP to

fund water pollution reduction practices (e.g., pollutant discharge regulations for concentrated animal feeding operations). In land retirement programs, targeted farmers of all types were more likely than other farmer types to be located in areas where proposed conservation efforts were expected to achieve the greatest reduction in soil erosion and the greatest improvement in water quality.

### ***Costs of Treatment***

The size of conservation payments varied among farmer groups.

- In EQIP, average payments (which represent the cost to government) to beginning farmers were significantly higher than the average payments to other farmers, while payments to limited-resource farmers were significantly lower. Both beginning and limited-resource farmers implemented a larger number of conservation practices than other farmers did, but the scale of those practices tended to be smaller.
- In CRP and WRP, targeted farmers enrolled a greater share of operated acreage and received smaller per acre payments, but the number and types of conservation practices adopted did not differ significantly from those of other farmers.

### **How Was the Study Conducted?**

The analysis relied on USDA data from EQIP and CRP administrative records, the 2007 Census of Agriculture, and the National Resources Inventory (NRI). The analysis also used data from the Agricultural Resource Management Survey (ARMS), which is conducted annually by the National Agricultural Statistics Service and the Economic Research Service.

The EQIP and CRP contract data identified the resource problems that received treatment and, for EQIP, how payments and adoption of practices varied between beginning/limited-resource producers and other participant types. The analysis used the ARMS data from 2004-07 to analyze payment and acreage enrollments in CRP and WRP by farmer type and to summarize the characteristics of targeted farmers. The 2001 ARMS data on conservation practice adoption (the most recent year data were available) were used to examine conservation practice adoption patterns in land retirement programs. The census, NRI, and other data characterized the distribution of farmer types relative to measures of environmental conditions.

EQIP, CRP, ARMS, NRI, and census data were used to characterize differences among current conservation program participants and to suggest that targeted and other farmers may differ in their ability to provide environmental benefits cost effectively. Providing firm answers about the impacts of favoring particular farmer types would require more information, including quantitative estimates of the environmental benefits provided by different farmer types and whether targeted participants are more cost-effective providers of benefits than nonparticipants. Also, targeted farmers' acreages are disproportionately small, and information about program participants' farm sizes would be needed to distinguish whether differences between farmer types are due to the type of farmer or farm size.





## Introduction

The Federal Government has a long history of providing assistance to farmers and ranchers to encourage the adoption of practices that reduce unintended negative environmental spillovers from agricultural production. Much of this conservation assistance is provided through voluntary programs that help finance the installation of conservation structures (e.g., riparian buffers and grassed waterways) and the adoption of environmentally friendly land management practices or that provide technical support to identify conservation needs and develop implementation plans. The 2008 Food, Conservation, and Energy Act (2008 Farm Act) is projected to increase conservation program funding by more than 17 percent. If appropriated at authorized levels, \$11.5 billion in conservation assistance will go to working farm and rangeland that remain in production, and \$13 billion will go to land retirement programs.

Both the 2002 and 2008 Farm Act legislation included provisions that ensure accessibility for all eligible farmers and ranchers to conservation programs. These provisions provide favorable payment terms to reduce unintentional barriers to participation for farmers who may face unique circumstances, such as limited farming experience, limited financial resources, and limited opportunities. The favorable payment terms are available to beginning, limited-resource, or socially disadvantaged segments of the farm population (“targeted farmers” for the purposes of this report).

Targeted farmers’ characteristics can affect their participation in conservation programs (see box, “Defining Targeted Farmers”). For example, recent Economic Research Service (ERS) research shows that beginning farmers tend to have smaller farms, lower levels of onfarm income, and different personal and household characteristics than do established farms (Ahearn and Newton, 2009) and that these differences can affect decisions about conservation activities (Lambert et al., 2006; Caswell et al., 2001).

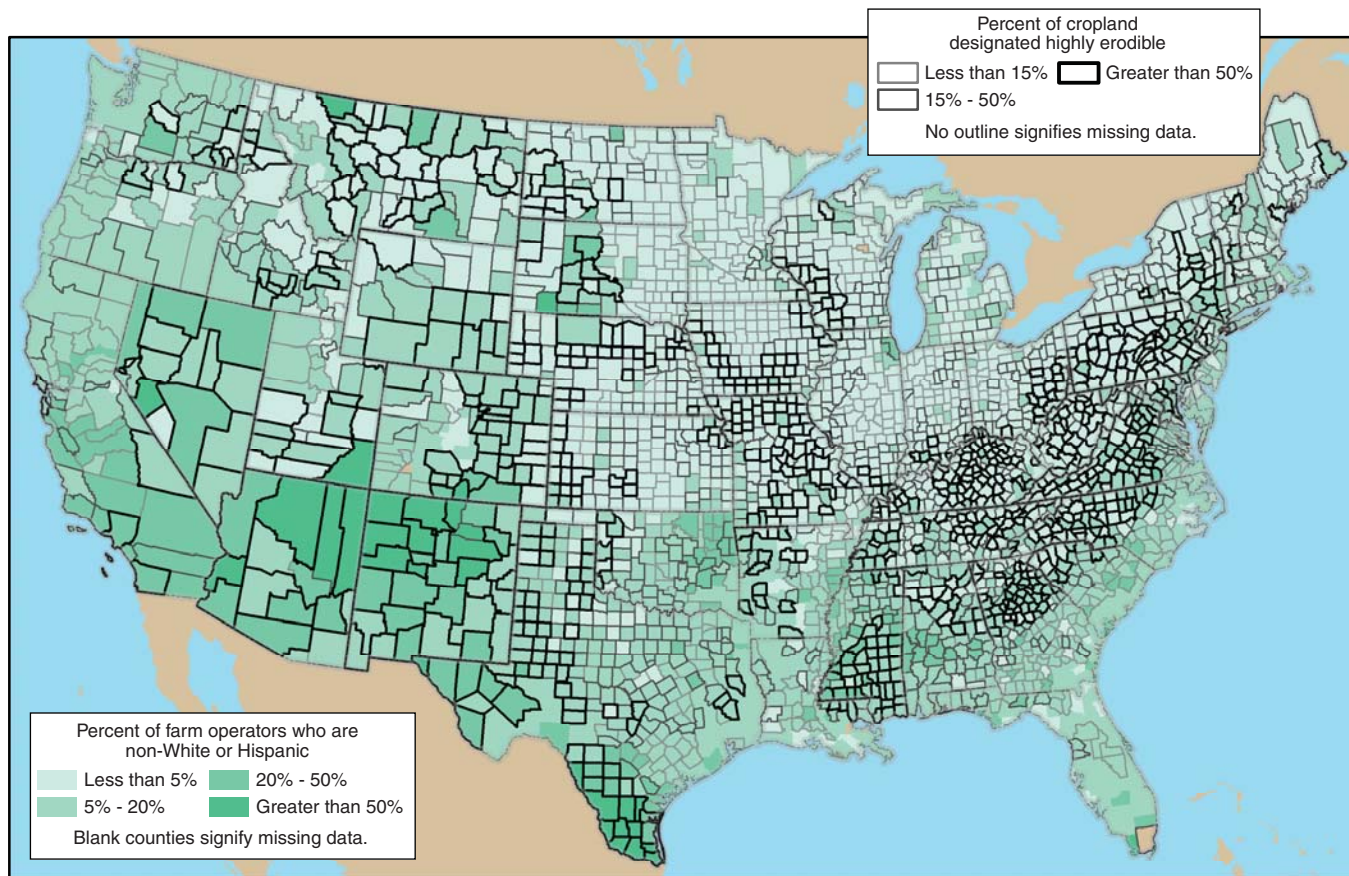
Providing favorable payment terms to particular types of farmers may make Federal conservation programs more accessible if targeted farmers could not participate without them. Some evidence suggests that encouraging participation by targeted farmers may also alter the environmental benefits generated by conservation programs. Comparing the distribution of farmer types and highly erodible land suggests that socially disadvantaged farmers are more likely than other farmers to be located in counties where a higher proportion of cropland is highly erodible (fig. 1).<sup>1</sup> When farmers are more likely to operate marginal land, targeting them for participation could increase the environmental benefits provided by conservation programs.

Changing program participation rates among targeted farmers could also affect program costs, and whether costs increase or decrease depends on the cost effectiveness of practices implemented by new participants. If the farmers who enroll in conservation programs provide environmental benefits at the lowest cost, encouraging their participation achieves both economic and accessibility goals. If applicants from targeted groups provide benefits at a higher cost, encouraging their participation may improve access at the expense of economic goals.

<sup>1</sup>This comparison uses 2007 Census of Agriculture data, which identifies the principal operator’s race and ethnicity, and 1997 National Resources Inventory data that identifies cropland by erodibility level. The ARMS data used in this report define socially disadvantaged farmers and ranchers, but the Census data do not allow us to identify these farmers in precisely the same way (see appendix, “Data Sources”). However, the geographic distribution of these farmers is comparable between Census and ARMS.

Figure 1

# **Distribution of selected farmer types and highly erodible cropland, by county**



Note: Counties in dark green with a black outline identify the greatest overlap between the distribution of selected socially disadvantaged groups and highly erodible cropland. Although some rangeland may also be subject to erosion, erodibility data are available only for cropland.

Source: 2007 Census of Agriculture (non-White and Hispanic operators) data and 1997 National Resources Inventory (highly erodible cropland) data.

This report examines participation patterns of targeted farmers relative to other farmers in major Federal conservation programs. We focus on the extent of their participation, the geographic distribution of participants, the types and costs of conservation practices implemented, and resource issues farmers typically face and address. Although the available data preclude a definitive assessment of economic tradeoffs from improving accessibility, this report improves our understanding of how these farmers use and impact conservation programs.

## Defining Targeted Farmers

USDA has established definitions for beginning, limited-resource, and socially disadvantaged farmers (referred to as “targeted” for the purposes of this report). Our definitions correspond to USDA definitions to the extent that available data allow us to do so.

***Beginning farmers and ranchers (BF)***—Using data from USDA’s Agricultural Resource Management Survey (ARMS) (see appendix, “Data Sources”), we can identify up to three operators per farm and define beginning farmers and ranchers as operators with not more than 10 years of experience. In 2006, however, ARMS identifies more than one operator in only one version of the survey. For that year, we define beginning farms as those operated by a primary operator with not more than 10 years of experience. USDA generally defines beginning farmers and ranchers as those who materially and substantially participate in farm or ranch operations, but have not operated a farm or ranch for more than 10 consecutive years. If operated by an entity, this requirement applies to all members of the entity (USDA, 2007).

***Limited-resource farmers and ranchers (LR)***—Farmers and ranchers are defined as limited resource if in each of the last 2 years they earned less than \$105,000 in gross farm sales (adjusted for inflation) and had low household income (USDA, 2007; Hoppe et al., 2007). Low household income means that the household income was less than the national poverty level for a family of four or was less than half the county median household income in the 2 previous years.

***Socially disadvantaged farmers and ranchers (SDA)***—In this report, we define a farm as operated by a socially disadvantaged farmer and rancher if the principal operator is African American, American Indian, Alaskan Native, Hispanic, Asian American, or Pacific Islander. We do not include women in this definition. While some socially disadvantaged farmer definitions include groups subject to gender prejudice, our definition is consistent with the Conservation Title in the 2008 Farm Act, which excludes women (unless they meet the socially disadvantaged definition some other way). Prior to the 2008 Farm Act, conservation programs administered by USDA did not use socially disadvantaged farmer definitions. USDA does, however, have various credit, insurance, and outreach programs to improve access to USDA programs for such farmers and ranchers (Dismukes et al., 1997a).



## What We Know About Targeted Farmers

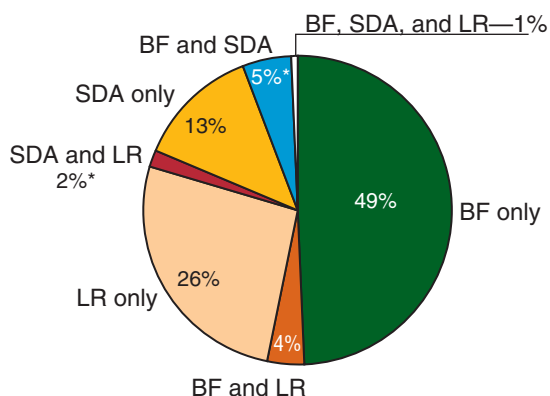
Targeted farmers include beginning, limited-resource, and socially disadvantaged farmers, and most farm operators identify with just one of these three groups (fig. 2). During 2005-07, the largest proportion (59 percent) of farms operated by targeted farmers was beginning-farmer operations. Socially disadvantaged (SDA) farmers accounted for 21 percent and limited-resource farmers, 33 percent. These percentages sum to more than 100, signaling that some farmers belong to multiple groups. For example, 5 percent of these farmers were both beginning and socially disadvantaged farmers, and 4 percent were both beginning and limited-resource farmers. Only 1 percent of these farms were operated by farmers who belonged to all three groups.

The characteristics of these operations can improve our understanding about why targeted farmers might participate in conservation programs differently than other farmers. Targeted farmers operate a sizable proportion of land. In 2007, they operated about 677,000 farms—nearly 31 percent of the Nation’s 2.1 million farms (fig. 3). Yet, these farmers account for a disproportionately small amount of farm production value, contributing only 12 percent of the nearly \$290 billion in farm commodities produced by all U.S. farms in 2007. This smaller farm production value reflects the fact that a larger proportion of these farmers operate small-scale family farms (defined as those with less than \$250,000 in sales) and that a smaller proportion of beginning and socially disadvantaged farmers identify farming as their major occupation—residential or lifestyle farms—compared with other farmer types (table 1).<sup>2</sup> Limited-resource farmers are more likely to report farming as their major occupation; however, fewer farms are operated by them. Low-sales farms and farmers who devote time to nonfarming occupations may face financial or labor constraints that preclude use of conservation practices that are capital- or management-intensive.

<sup>2</sup>The Economic Research Service developed a classification system that categorizes farms based on sales, major occupation of the primary operator, and farm ownership structure. For a detailed description, see Hoppe et al., 2007.

Figure 2

### Farms operated by targeted farmers and ranchers



\* Coefficient of variation is between 25 percent and 50 percent.

BF=Beginning farmers; SDA=Socially disadvantaged farmers; LR=Limited-resource farmers.

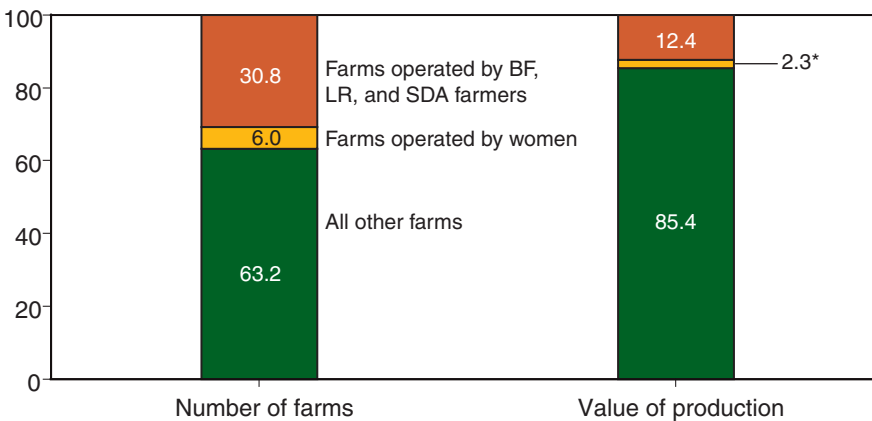
Note: Farms operated by women are not included with socially disadvantaged farmers, unless they otherwise meet the SDA definition.

Source: ERS calculation based on USDA’s pooled 2005-07 Agricultural Resource Management Surveys, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Figure 3

### Share of total farms and production, by operator status

Percent



\* Coefficient of variation is between 25 percent and 50 percent.

BF=Beginning farmers; LR=Limited-resource farmers; SDA=Socially disadvantaged farmers.

Notes: Farms operated by women include farms with female primary operators that do not meet the definitions of targeted farmers. The “all other farms” category includes farms where women are not primary operators. Totals may not sum to 100 due to rounding.

Source: ERS calculations based on USDA’s 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Although their farms are typically small, some targeted farmers operate relatively large farms. In 2007, the median acres operated—the midpoint of the range of acres operated—by targeted farmers ranged from 41 to 75 acres, compared with 94 acres for small family farms and 118 acres for farms of all sizes operated by other farmer types (table 2). The high average number of acres operated, relative to median number of acres operated, suggests that all farmer types include relatively large farms. In particular, a few socially disadvantaged farms are organized as nonfamily farms that operate larger farms, on average. Also, socially disadvantaged farms specializing in live-stock are about 150 acres larger, on average, than socially disadvantaged farms in general.

Beginning and limited-resource farmers are somewhat more likely than other farmers to report no production value. The share of these farmers reporting zero production value varies between 26 and 28 percent, compared with 23 percent of small family farms operated by other farmer types.<sup>3,4</sup> Recent research that analyzes production and conservation behavior revealed that decisions not to produce crops or livestock are positively associated with conservation payments (Lambert et al., 2006). This suggests that conditions that temporarily rule out farming may not preclude conservation program participation, although a lack of production over several years could make some farmers ineligible to participate.

For farms reporting a positive production value, commodity production by targeted farmers appears similar to small family farms, at least at first glance. Livestock accounts for most of the production value for farmers of all types, and more than half of socially disadvantaged farmers specialize in livestock (table 2). Specialization in beef cattle and other grazing livestock is common among small farms, due to the low labor and low cost requirements (Hoppe et al., 2007). Of farmers with a majority of their production value from crop

<sup>3</sup>Production value reflects the market value of what is produced in a given year, regardless of whether it is shared among multiple parties or put into inventory. Farms may have no production due to adverse weather conditions, disease, or other reasons (Hoppe et al., 2007).

<sup>4</sup>When women are included in the definition of socially disadvantaged farmers, the proportion of socially disadvantaged farmers reporting zero production value rises from 20 percent to 33 percent.

Table 1

**Number of farms and production value, by farm typology and farmer status, 2007**

	Small family farms <sup>1</sup>				Large family farms	Nonfamily farms	All farms
Item	Retirement	Residential and lifestyle	Farming occupation	Total			
All farms:							
Total farms (number)	408,306	1,004,679	535,779	1,948,764	205,368	42,633#	2,196,766
Percent of all farms	18.6	45.7	24.4	88.7	9.4	1.9	100
Percent of small family farms	21.0	51.6	27.5	100	—	—	—
Value of production (percent of U.S. total)	1.5	4.2	11.1	16.8	67.5	15.7	100
All BF, LR, and SDA farmers: <sup>2</sup>							
Total farms (number)	166,692	335,229	150,088	652,009	16,993	8,002 #	677,005
Percent of all BF, LR, and SDA farmers	24.6	49.5	22.2	96.3	2.5	1.2	100
Percent of small family farms	25.6	51.4	23	100	—	—	—
Value of production (percent of U.S. total)	0.4	0.9	1.6	2.9	6.8	2.7	12.4
Beginning farmers:							
Total farms (number)	47,582	254,190	54,089	355,861	13,715	7,252 A	376,829
Percent of all beginning farmers	12.6	67.5	14.4	94.4	3.6	1.9	100
Percent of small family farms	13.4	71.4	15.2	100	—	—	—
Value of production (percent of U.S. total)	0.1	0.7	0.7	1.5	4.8	1.6	7.8
Limited-resource farmers:							
Total farms (number)	120,333	49,328	85,331	254,992	0	0	254,992
Percent of all limited-resource farmers	47.2	19.3	33.5	100	0	0	100
Percent of small family farms	47.2	19.3	33.5	100	—	—	—
Value of production (percent of U.S. total)	0.2	0.1	0.8	1.1	0	0	1.1
Socially disadvantaged farmers:							
Total farms (number)	16,842	72,388	24,677	113,907	4,129	818 #	118,854
Percent of all SDA farmers	14.2	60.9	20.8	95.8	3.5	0.7	100.0
Percent of small family farms	14.8	63.6	21.7	100	—	—	—
Value of production (percent of U.S. total)	0.1	0.2	0.3	0.6	2.5	1.2	4.2
Socially disadvantaged farmers, including women in the definition:							
Total farms (number)	81,048	183,439	76,965	341,452	8,992	3,940 ##	354,383
Percent of all SDA farmers	22.9	51.8	21.7	96.4	2.5	1.1	100
Percent of small family farms	23.7	53.7	22.5	100	—	—	—
Value of production (percent of U.S. total)	0.2	0.4	0.6	1.1	4.1	1.6	6.8
Other farmer types: <sup>3</sup>							
Total farms (number)	241,614	669,450	385,691	1,296,755	188,375	34,631 #	1,519,761
Percent of all other farmer types	15.9	44.0	25.4	85.3	12.4	2.3	100
Percent of small family farms	18.6	51.6	29.7	100	—	—	—
Value of production (percent of U.S. total)	1.1	3.3	9.5	13.9	60.7	13.0	87.6

# Coefficient of variation (CV=Standard Error / Estimate) is between 25 percent and 50 percent; ## CV is between 50 percent and 75 percent.

— Data not applicable. BF=Beginning farmers; LR=Limited-resource farmers; SDA=Socially disadvantaged farmers.

Note: Totals may not sum to 100 due to rounding.

<sup>1</sup>Small family farms include all farms with less than \$250,000 in gross sales.

<sup>2</sup>Includes all farms operated by beginning, limited resource, or socially disadvantaged farmers. Does not include farms operated by women who do not meet other definitions of socially disadvantaged farmers. Some farmers may fit the definition of more than one category and are included in the counts for each.

<sup>3</sup>Includes all farms that do not meet the definition of beginning, limited-resource, or socially disadvantaged farmers. Includes farms operated by women who do not meet other definitions of socially disadvantaged farmers.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, version 1, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Table 2

**Selected farm characteristics and financial indicators, by farmer status, 2007**

Item	Selected farmer types <sup>1</sup>				Other farmer types <sup>2</sup>	
	Limited resource	Socially disadvantaged	Socially disadvantaged, including women	Beginning farmer	Small family farms	All farms
<b>Acres operated:</b>						
Mean (average)	153	314	234	163	270	509
Median	75	48	49	41	94	118
Percent of U.S. farmland	4.3	4.5	9.5	6.8	38.6	85.2
Percent of U.S. cropland	3.4	2.1	5.3	5.6	34.1	89.2
<i>Percent of group</i>						
<b>Tenure:</b>						
Full owner	78.7	68.7	78.6	77.6	65.8	59.9
Part owner	14.4	20.9	16.3	13.1	29.7	34.2
Tenant	D	10.4#	5.1#	9.3	4.5	5.9
<b>Commodity specialization:<sup>3</sup></b>						
Livestock	47.5	53.2	44.4	43.9	45.4	44.5
Crop	24.4	26.1	20.4	26.6	29.8	33.8
<i>Type of crop—</i>						
Field crops	18.8	12.1#	10.8	21.0	23.8	27.3
High value crops <sup>4</sup>	D	14.0	9.6	5.6	6.0	6.5
Whole farm CRP/WRP <sup>5</sup>	D	D	D	D	1.7	1.5
Zero value of production	25.9	20.4	33.2	28.1	23.2	20.2
<b>Sales class:<sup>6</sup></b>						
\$0 sales	17.6	17.6	23.6	20.4	15.8	13.6
\$1 to \$49,999	77.4	70.4	67.0	69.3	65.5	56.7
\$50,000 to \$99,999	D	4.6#	3.8	3.4	8.9	8.0
\$100,000 to \$174,999	D	1.9#	1.7	1.8	5.9	5.1
\$175,000 to \$499,999	0.0	3.0	2.2	2.9	4.0	9.5
\$500,000 or more	0.0	2.6	1.0	2.3	0.0	7.1
<b>Financial indicators:</b>						
Net farm business income (average \$)	2,448#	19,831#	10,810#	9,975	9,992	45,004
Net farm business income, less conservation payments (average \$)	1,972#	19,497#	10,070#	9,475	9,089	43,842
Median net farm business income	2,409#	D	911##	673#	4,006	5,634
Operating expense ratio <sup>7</sup>	1.25	0.82	0.90	0.90	0.93	0.76
Debt to asset ratio <sup>8</sup>	0.03	0.09	0.07	0.12	0.04	0.08
Percent of household income from off-farm sources <sup>9</sup>	182.2	91.4	101.0	103.2	102.7	81.6

# Coefficient of variation (CV=Standard Error / Estimate) is between 25 percent and 50 percent; ##CV is between 50 percent and 75 percent.

CRP=Conservation Reserve Program; WRP= Wetlands Reserve Program.

D = Not reportable due to small sample size or estimate validity concerns.

<sup>1</sup>The farmer categories are not mutually exclusive (fig. 1).

<sup>2</sup>Includes all farms that do not meet the definition of beginning, limited resource, or socially disadvantaged farmers. Includes farms operated by women who do not meet other definitions of socially disadvantaged farmers.

<sup>3</sup>Commodity that accounts for at least half of the farm's value of production.

<sup>4</sup>Vegetables, fruits and tree nuts, and nursery and greenhouse.

<sup>5</sup>Defined as farms with all acres operated enrolled in CRP or WRP and no production.

<sup>6</sup>Sales classes are defined by gross farm sales, which include crop and livestock sales (regardless of who has claim on it), plus shares of production and government payments. For more detail, see Hoppe et al. (2007, p. 40).

<sup>7</sup>Total cash operating expenses divided by total gross cash farm income.

<sup>8</sup>Total liabilities divided by total assets.

<sup>9</sup>Calculated as (total off-farm household income divided by total household income)\*100.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.



sales, a larger proportion of socially disadvantaged farmers focus on high-value specialty crops, such as vegetables, fruits and tree nuts, and nursery and greenhouse products.

Various measures of financial performance reveal that not all targeted farmers are alike, and some are more likely to face issues that prevent them from adopting conservation practices. Limited-resource farmers may be more likely to face liquidity constraints due to lower net farm income and a higher operating expense ratio compared with other farmer types (table 2). Limited-resource farmers rely most heavily on off-farm income, the majority of which comes from unearned sources (Social Security, pensions, dividends, interest, and rent) (Hoppe et al., 2007). Most socially disadvantaged and beginning farmers operate residential farms, and most of their off-farm income comes from earned wages or self-employment (Hoppe et al., 2007).

Targeted farmers are located across the United States, but some geographical concentration exists. The proportion of farms owned by beginning farmers ranges from 4 percent to 50 percent across U.S. counties, with higher proportions concentrated in Texas, Arizona, Colorado, and Florida (Ahearn and Newton, 2009). Socially disadvantaged farmers appear dispersed as a whole, but a large majority of African American farms are found in the South, and most American Indian farmers are found west of the Mississippi River. Farms operated by Asian/Pacific Islander operators are concentrated in California and Hawaii, while Hispanic-operated farms are concentrated in California, Colorado, Florida, New Mexico, and Texas (Dismukes et al., 1997a, 1997b).

## Conservation Programs Available to Targeted Farmers

All farmers have the opportunity to participate in Federal conservation programs, as long as they meet program eligibility requirements. Certain program provisions are specifically designed to increase access to working-lands programs for targeted farmers and ranchers. Understanding the differences in program incentives, eligibility, and purpose help explain observed patterns of program participation by members of these groups.

Federal agricultural conservation programs use a voluntary approach to improve environmental conditions related to agricultural production. Federal conservation funding is divided among land retirement, working-lands conservation, land preservation, and technical assistance programs. Of these, the Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), and Wetlands Reserve Program (WRP) are the three largest programs and constitute about 70 percent of USDA conservation spending (see box, “Major Federal Conservation Programs”).

**Conservation programs use different approaches to address environmental concerns.** Some goals of the major Federal conservation programs are similar—including reducing soil erosion, improving water and air quality, and enhancing wildlife habitat—but the approaches used to achieve these goals are different. The CRP and WRP seek to improve environmental quality by retiring environmentally sensitive land from production. EQIP helps producers address environmental concerns by providing financial assistance to install conservation structures and adopt management practices on agricultural lands that remain in production.

Some farmers may be more likely than others to participate in land retirement than in working lands programs, although many farmers may participate in both. The CRP and WRP have historically been popular, in part, because of the steady source of income that producers can receive from annual rental payments. Retired farmers and operators whose primary occupation is not farming may be more likely than other farmers to retire land and enroll in CRP and more likely to use land retirement conservation practices than working-lands practices (Lambert et al., 2006). As a working-lands program, EQIP may be most attractive to producers who want to improve environmental performance without reducing the operation’s productive capacity, who operate land that is not eligible for CRP or WRP enrollment, who apply to CRP or WRP but are not accepted, or who favor shorter term conservation program contracts.

**EQIP and land retirement programs have different enrollment methods and criteria.** In CRP, highly erodible land is eligible for enrollment if it has been planted with an agricultural commodity (including alfalfa and other multi-year grasses and legumes in rotation) in 4 of the 6 crop years prior to 2002 or is located in a designated conservation priority area.<sup>5</sup> In general signups, which account for the vast majority of enrolled acreage, applications from across the country are pooled, ranked, and selected according to an Environmental Benefits Index (EBI) score (see box, “Major Federal Conservation Programs”). Rental payments received by the producer are

<sup>5</sup>The 2008 Farm Act requires planting in 4 of the 6 years prior to 2008. Land coming out of CRP is considered planted, unless it is in trees.

## Major Federal Conservation Programs

### *Conservation Reserve Program (CRP)*

Established by the 1985 Food Security Act, the CRP seeks to provide environmental benefits by encouraging the planting of long-term, resource-conserving covers, such as trees or native grasses, on marginal and environmentally sensitive retired agricultural land. In exchange, producers receive an annual rental payment over the term of a 10- or 15-year contract, as well as cost-share payments to offset part of the cost of installing conservation measures.

Producers can enroll land under either a competitive general signup or noncompetitive continuous signup. Under the competitive signup process, each parcel of land proposed for enrollment is assigned an Environmental Benefits Index (EBI) score. The EBI accounts for multiple environmental benefits that would be provided and the expected cost of the contract (USDA-FSA, 2008). Individual scores are calculated for each of the six factors in the EBI: benefits from soil erosion reduction, water quality benefits, wildlife benefits, air quality benefits, cost, and a measure of benefits likely to endure past the contract termination date. Proposals are nationally ranked and selected based on their overall EBI score. Land suitable for certain high-priority conservation practices (e.g., grassed waterways, filter strips, and riparian buffers) and meeting eligibility requirements may be enrolled without being subject to competitive bidding through a continuous signup.

CRP is the largest Federal conservation program; outlays totaled \$1.86 billion in 2007 (USDA-FSA, 2008), and projected expenditures for 2008-12 total \$10.9 billion.<sup>1</sup>

### *Environmental Quality Incentives Program (EQIP)*

EQIP, established under the Federal Agricultural Improvement and Reform Act of 1996, addresses environmental concerns by providing incentives and technical help to install conservation structures and management practices on working agricultural lands. EQIP pays a portion of the costs for structural and vegetative practices, and most contracts are eligible for cost-share payments up to 75 percent of the costs of conservation structures. Targeted farmers are eligible for cost-share rates 25 percent higher than the otherwise applicable rate, up to 90 percent. EQIP also provides incentive payments covering

100 percent of the estimated cost of adopting management practices for all farmer types.

Funding decisions are made by States or local entities; each State determines its own conservation priorities and ranking criteria. In some cases, these criteria include targeted farmer status. Prior to 2002, producers could bid down payment rates to increase the probability of funding. The bidding process was eliminated in the 2002 Farm Security and Rural Investment Act, so smaller farmers, who were less able to bid down payment rates, would not be at a competitive disadvantage (USDA, 2003).

The duration of EQIP contracts ranges from 1 to 10 years. Management practice agreements include incentive payments for up to 3 years. A producer can receive up to \$300,000 in payments for all contracts held over a 6-year period. Total EQIP funding was \$1 billion in 2007, about 22 percent of Federal conservation program funding (USDA-NRCS, 2007); projected expenditures for 2008-12 are \$7.2 billion.

### *Wetlands Reserve Program (WRP)*

WRP was established by the 1990 Food, Agriculture, Conservation, and Trade Act. It seeks to restore, protect, and enhance wetlands by retiring marginal agricultural lands. Land enrolled in WRP may be placed in a permanent conservation easement or a 30-year easement or may be improved using a cost-share restoration agreement. Easement payments may not exceed the lowest of the fair market value of the land, a geographic payment cap determined by the Secretary, or an offer made by the landowner.

Applications to WRP are scored based on cost and environmental considerations. The NRCS State Conservationists have the authority to develop scoring criteria and select applications.

WRP is the smallest of the major conservation programs, both in terms of acres enrolled and budget. WRP funding was about \$227 million in 2007, or about 6 percent of total Federal conservation program funding (USDA-NRCS, 2007); projected expenditures for 2008-12 are \$2.1 billion.

<sup>1</sup>Projected expenditures come from ERS calculations based on the Congressional Budget Office's budget score of the 2008 Food, Conservation, and Energy Act (H.R. 2419).

determined according to county-level average land rents and soil productivity, but producers can bid payments down to increase their EBI score, increasing their chance of selection.

In WRP, land is eligible for enrollment if it is restorable as a wetland and suitable for wildlife benefits. WRP funds are allocated to State NRCS offices, which set enrollment priorities and make enrollment decisions. In CRP and WRP, enrollment priority is not given to farmers who are new to farming, have limited resources, or are socially disadvantaged. For these programs, participation patterns for all farmers can vary, depending on the relationship between national (in CRP) or State/sub-State (in WRP) conservation priorities and the resource concerns farmers are willing to address.

Like WRP, EQIP funding is allocated to State NRCS offices, and State offices are given the latitude to determine conservation priorities and whether State or sub-State offices make enrollment decisions. Unlike WRP or CRP, some State offices have set aside funds or prioritized enrollments of certain farmer types. The 2008 Farm Act mandates that at least 5 percent of all financial assistance in EQIP be made available to beginning farmers and another 5 percent be made available to socially disadvantaged farmers. The legislation specifies a national threshold and does not require each State or sub-State office to adopt the same threshold.

**Targeted farmers qualify for higher payment rates in EQIP.** EQIP also includes favorable payment terms to encourage participation by targeted farmers, while CRP and WRP contain no such provisions. In EQIP, all participants can receive financial assistance of up to 75 percent of the cost of installing structural and vegetative practices and 100 percent of the cost of adopting conservation management practices. Since 2002, beginning and limited-resource farmers have been eligible to receive up to 90 percent of the cost of structural and vegetative practices (although not all States offered the higher rates to these farmers). Under the 2008 Farm Act, socially disadvantaged farmers and ranchers became eligible for the higher EQIP rates for these practices, and all three targeted groups became eligible for cost-share rates that were at least 25 percent higher than would otherwise be applicable, up to 90 percent of the cost.



## To What Extent Do Targeted Farmers Participate in Conservation Programs?

Many factors can affect farmers' decisions to participate in conservation programs, including whether the financial benefits from enrolling exceed the costs, the type and severity of environmental problems they face, and whether they believe their chances of being accepted will offset the transaction costs of enrolling. Analyzing enrollment patterns can illuminate whether different types of farmers participate in these programs to different degrees.

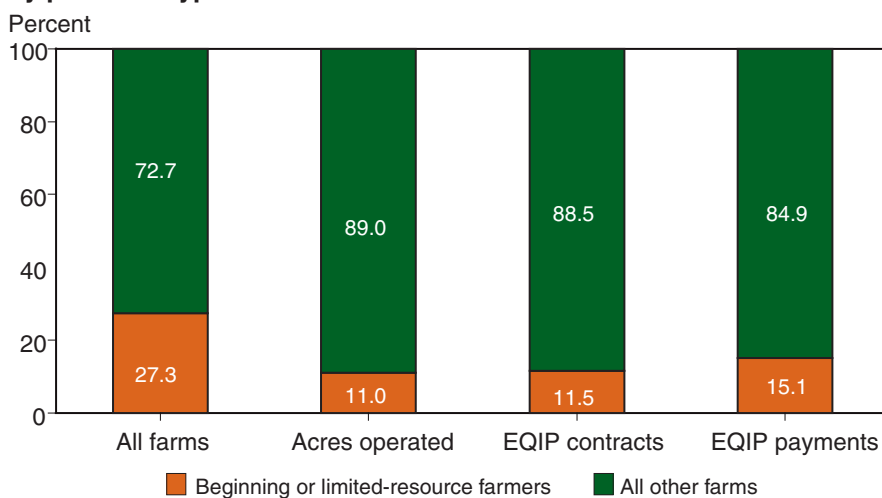
**Beginning and limited-resource farmers may be under-represented in EQIP, but representation in CRP and WRP is less clear.** Participation in EQIP can be measured for farms operated by beginning farmers and limited-resource farmers—the two groups for which data on farmer status were collected during our study period (fig. 4).<sup>6</sup> These two groups operated about 27 percent of all farms, but were associated with only 12 percent of EQIP contracts and received 15 percent of EQIP financial assistance payments.<sup>7</sup> Data on the number of acres operated by type of EQIP participant were not available, so evaluating participation by this measure was not possible. Also, although limited-resource farmers were about twice as likely to report farming as their major occupation than beginning farmers, they were no more likely to participate in EQIP.

The extent to which particular farmer types participate in land retirement programs depends on how participation is measured. When participation is measured based on enrolled acres, the data suggest targeted farmers are proportionally represented in these conservation programs. These farmers operated nearly 15 percent of farmland acres and controlled 17 percent of acres enrolled in CRP and WRP in 2007 (fig. 5). On the other hand, these

<sup>6</sup>Although we are not able to identify socially disadvantaged farmers in the EQIP contract data, we are able to determine which contracts are on or near Indian reservations. See box, “EQIP Participation on American Indian Reservations.”

<sup>7</sup>Some farms have more than one EQIP contract. However, counting contracts instead of farms does not appear to bias the representation of beginning and limited-resource producers.

Figure 4  
**Share of farms, acres operated, and participation in EQIP, by producer type**



EQIP= Environmental Quality Incentives Program.

Sources: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service (all farms and acres operated); USDA-NRCS contract data, fiscal 2006 (EQIP contracts and EQIP payments). NRCS contract data identifies beginning and limited-resource farmers, but not socially disadvantaged status.

farmers operated 31 percent of all farms, but they operated only 22 percent of farms enrolled in CRP or WRP. Taken together, the data suggest that, although disproportionately fewer of these farmers enroll land in land retirement programs, those that do enroll tend to enroll more of their land.

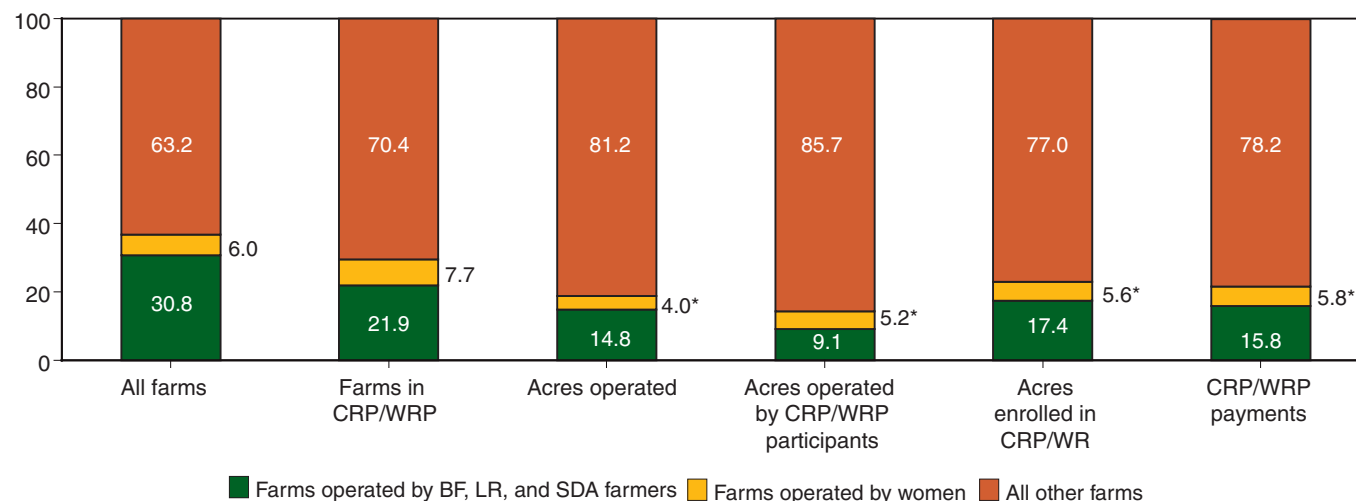
Comparing payment patterns across programs suggests that participation rates by beginning and limited-resource farmers were not clearly higher in EQIP than in CRP/WRP (data on socially disadvantaged farmer participation in EQIP are not available). These two groups of farmers received similar proportions of payments in both programs (15.1 percent in EQIP and 15.0 percent in CRP/WRP). The proportions are similar despite the eligibility of beginning and limited-resource farmers for more favorable payment terms in EQIP since 2002 and their enrollment priority in some States. However, a gap between EQIP and CRP/WRP, in terms of these farmers' participation rates (as measured by payments), could have existed without the favorable terms. A gap might also have existed if a CRP eligibility requirement that all land offered for retirement be previously cropped 4 of the 6 crop years prior to 2002 had not been in effect (USDA-FSA, 2008). A significantly smaller proportion of beginning and limited-resource farmers specialize in crop production (table 2), so fewer of these farmers qualify for CRP enrollment. The relative sizes of the programs may also matter. CRP and WRP expenditures exceeded EQIP expenditures by at least 2 to 1 in recent years, so land retirement programs were able to enroll more participants of all types. A preference for land retirement programs may be due, in part, to beginning and limited-resource farmers finding reduced labor requirements of land retirement practices more appealing (Claassen et al., 2007; Lambert et al., 2006).<sup>8</sup>

<sup>8</sup>It is possible that preferences for particular programs may be driven more by farm size than farmer type. Data on the size of EQIP participant farms are not available, precluding us from drawing conclusions about the impact of farm size.

Figure 5

# Share of farms, acres operated, and CRP or WRP participation, by producer type

Percent



\* Coefficient of variation is between 25 percent and 50 percent.

BF=Beginning farmers; LR=Limited-resource farmers; SDA=Socially disadvantaged farmers.

CRP=Conservation Reserve Program; WRP=Wetlands Reserve Program.

Notes: Farms operated by women include farms with female primary operators who do not meet the definitions of beginning, limited-resource, or socially disadvantaged farmers. The "all other farms" category includes farms where women are not primary operators. Totals may not sum to 100 due to rounding.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

## EQIP Participation on American Indian Reservations

Although much of this report focuses on the enrollment patterns of different types of farmers, it is also important to examine conservation programs in certain types of communities or geographic areas. This places more emphasis on where conservation practices are adopted and what types of communities may accrue environmental benefits from conservation programs.

As an example, we examined EQIP participation and practice adoption on American Indian reservations and trust land. Reservation communities may be considered disadvantaged by a variety of measures, including household income and poverty rates, educational attainment, health outcomes (Ward et al., 2004), and food security (Gundersen, 2008). Whether this characterization

extends to the environmental benefits derived from EQIP is not clear; the characteristics that define a community as disadvantaged may not be closely associated with factors that determine EQIP participation and practice adoption. For example, farmers on reservations are not necessarily disadvantaged; reservation farmland may be leased to non-American Indian farm operators, and farm operators who are American Indian may not share the characteristics of other nonfarmers in the community.

By comparing EQIP administrative data with the established borders of reservations from the Bureau of Indian Affairs, we determined which EQIP contracts were within the borders of American Indian reservations.

### EQIP participation and farm characteristics, by location on or off American Indian reservations or tribal trust land

EQIP participation	Contracts on reservation farmland	Contracts off reservation farmland <sup>1</sup>	All contracts <sup>2</sup>
Number of contracts	641	14,707	39,030
Percent of contracts associated with BF or LR	21.2	10.8	11.5
BF or LR contracts:			
Median total contract payment (\$)	28,428	17,365	8,618
Percent of total payments to BF or LRP contracts	1.7	13.5	15.1
Contracts with other farmer types:			
Median total contract payment (\$)	18,048	12,144	12,245
Percent of total payments	4.5	80.3	84.9
Selected farm characteristics <sup>3</sup>	Farms operating reservation farmland	Farms not operating on reservations <sup>4</sup>	All farms
Average acres operated	479*	592	582
Percent of total acres operated	7.7	92.3	100
Percent of farms	9.3	90.7	100
Average value of production (\$)	80,415*	167,803	159,682

EQIP=Environmental Quality incentives Program; BF = Beginning farmer; LR = Limited resource farmer.

\*Indicates significant differences between reservation and nonreservation farms based on pairwise two-tailed delete-a-group jackknife t-statistics at the 90-percent confidence level. See Kott, 2001.

<sup>1</sup>Includes contracts in States where there are reservation contracts: Arizona, California, Colorado, Idaho, Kansas, Michigan, Minnesota, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming.

<sup>2</sup>Includes all contracts in all States from 2006.

<sup>3</sup>Calculated using the 2007 Agricultural Resource Management Survey (ARMS) Phase III.

<sup>4</sup>The comparison group for ARMS is not directly comparable with the EQIP contract data, although ARMS is designed to provide nationally representative estimates. Includes farms in the following States: Arizona, Florida, Idaho, Kansas, Michigan, Minnesota, Montana, Nebraska, Nevada, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming.

Source: Economic Research Service.

Nationwide, 641 contracts in 2006 were on a reservation, or about 2 percent of all contracts. We then compared these reservation contracts with contracts outside American Indian reservation borders.

Contracts on reservations received larger total payments from EQIP contracts than contracts off reservations. The median total contract payment was between \$6,000 and \$11,000 larger on reservations, even after accounting for differences between beginning and limited-resource farmers and other farmers. Beginning and limited-resource farmers are eligible for higher cost-share rates, which may result in larger payments for the same size practice. In this case, the scale of practices may account for a portion of the larger payments on reservations. Calculating the average sizes of the most common structural practices (e.g., fences and pipelines) confirm that contracts on reservations tend to involve larger structures. Some evidence suggests that larger payments and practices may yield greater environmental benefits, at least when addressing certain environmental concerns (Wu et al., 2004). To the extent that this relationship holds for EQIP participants, per contract environmental benefits may be greater for reservation contracts.

Farms on reservations are less likely to be enrolled in EQIP than nonreservation farms. Reservations account for about 9.3 percent of farms and 7.7 percent of operated farmland in the comparison States, but about 4.2 percent of EQIP contracts and 6.2 percent of EQIP funding in 2006. Participation in EQIP depends on a variety of landscape and farm-level factors, so it is difficult to say if under-representation in this case amounts to being underserved. For example, contracts on reservations are less likely to be associated with

cropland that is designated as highly erodible. Under-representation in EQIP may reflect differences in environmental conditions that make participation less likely on reservation farms.

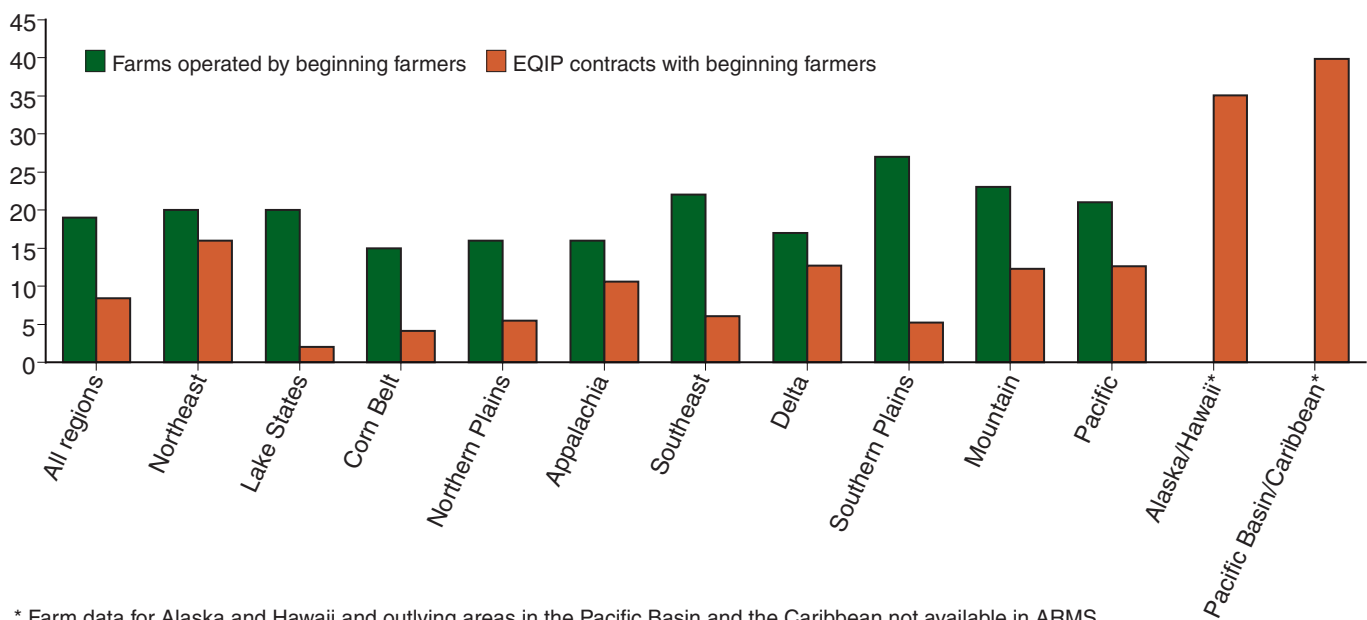
Are American Indian reservations less likely to accrue benefits from participation in EQIP? The results suggest a mixed conclusion. Reservation farms appear to be under-represented in EQIP, but this fact alone is not conclusive. EQIP contracts on reservation farmland are more likely to be associated with beginning or limited-resource farmers and to be eligible for higher cost-share rates. The higher cost-share rates may encourage participation among farmers who might not otherwise be able to participate in EQIP. Also, the typical contracts in EQIP are larger and may provide greater environmental benefits per contract on reservations. Contracts on reservation farmland also appear to address different environmental issues, which suggests that the benefits derived from EQIP contracts are different for reservation communities. Reservation contracts are less likely to address soil erosion and water quality problems and more likely to address issues related to plant condition and domestic animals. Addressing different environmental concerns may also affect the cost and the size of practices. A variety of factors, however, influence the benefits derived from conservation practices, and further study is needed to examine how these factors may be related to the distribution of environmental benefits from EQIP.



Another program design difference between working lands and land retirement programs could affect relative participation patterns across programs. Applicants in CRP and WRP can bid down the amount of payment they are willing to accept to improve their chances of enrollment, but bidding has not been allowed in EQIP since 2002 due to perceptions that it favored larger or more well off farmers (USDA, 2003). Beginning and limited-resource farmers' participation at similar rates in land retirement programs—programs where bidding is allowed—raises questions about whether bidding puts these farmers at a competitive disadvantage. Allowing producers to bid down the payments can improve program cost effectiveness, when enrollment priority is given to producers who could provide environmental benefits most cost effectively. However, many factors affect decisions about participation in working lands and land retirement programs (Lambert et al., 2006), and further studies would need to account for these characteristics to determine whether bidding options do affect participation rates.

**Targeted farmers across the United States enroll in conservation programs, but variation across regions suggests national policies could have geographically uneven impacts.** In EQIP, beginning farmers held nearly 3,300 (8 percent) of the approximately 39,000 total contracts initiated in 2006. The Southern Plains and Corn Belt regions have the greatest number of EQIP contracts (31 percent of all contracts), but the greatest concentration of beginning-farmer contracts (31 percent of beginning-farmer contracts) is found in the Delta and Mountain regions. Beginning farmers in the Lake States and Southern Plains regions were least likely to participate in EQIP, where they represented 20 percent and 27 percent of the farm population respectively, but held only 3-5 percent of EQIP contracts (fig. 6). In Alaska, Hawaii, and the outlying areas in the Pacific Basin and the Caribbean (U.S.

Figure 6  
**Beginning farmers in the farm population and as a share of EQIP contracts, by region**  
Percent of contracts/farms



\* Farm data for Alaska and Hawaii and outlying areas in the Pacific Basin and the Caribbean not available in ARMS. EQIP=Environmental Quality Incentives Program.

Sources: ERS calculations based on USDA's pooled 2005-07 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service (farm population); USDA-NRCS contract data, fiscal 2006 (EQIP contracts).

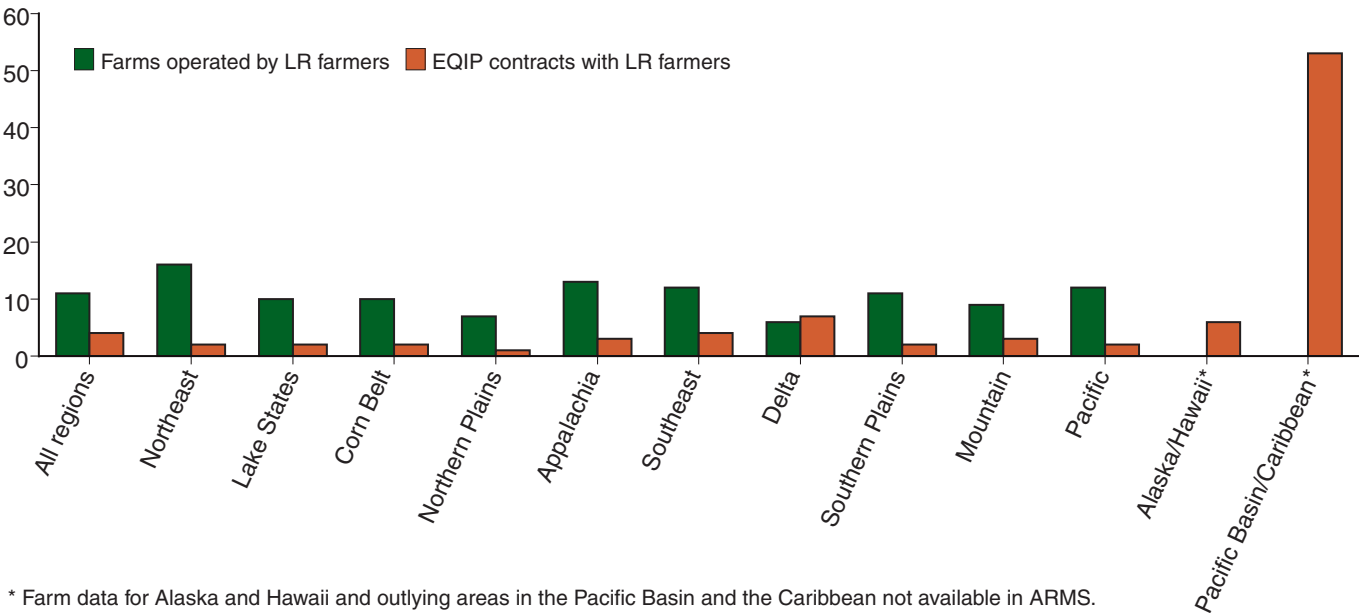
territories), at least 35 percent of the contracts were held by beginning farmers. While comprising a large proportion of contracts in these areas, relatively few contracts (186 contracts) were written in these regions, so their impact on beginning farmer participation nationwide is small.

The highest concentration of EQIP contracts with limited-resource producers is located in the Delta region (310 of 1,373 contracts with limited-resource producers initiated in 2006) (fig. 7). The U.S. territories also play an important role in limited-resource producer contracts, both in terms of numbers and as a percentage of contracts in the region. In 2006, 174 contracts were written with limited-resource farmers in the Pacific Basin and Caribbean, and these contracts represent over 50 percent of all contracts held by farmers in the U.S. territories.

In CRP and WRP, 18 percent of all contracts were held by beginning farmers during the 2005-07 period, and these farmers participated in proportions similar to that of the farm population in a few regions (fig. 8). In the Delta region, land retirement programs were popular with beginning farmers. These farmers represented 17 percent of the farmer population and operated about 14 percent of the acres, but accounted for 23 percent of CRP/WRP participants and about 35 percent of acres enrolled in the region.

In land retirement programs, notable differences also exist in regional participation patterns for limited-resource and socially disadvantaged farmers. During 2005-07, these farmers in the Appalachian and Southern Plains regions were more likely to be enrolled in CRP/WRP (fig. 9). About 28 percent of CRP/WRP participants in these regions are limited-resource or socially disadvantaged farmers, but they comprise only 16-22 percent of the farmer population. The Southern Plains region includes States with a

Figure 7  
**Limited-resource farmers in the farm population and as a share of EQIP contracts, by region**  
 Percent of contracts/farms

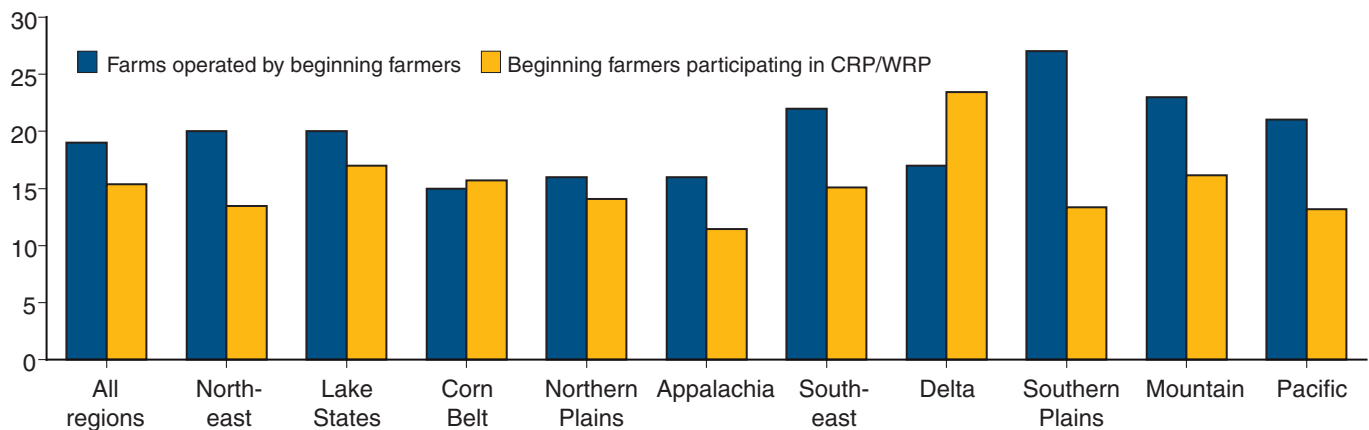


\* Farm data for Alaska and Hawaii and outlying areas in the Pacific Basin and the Caribbean not available in ARMS.  
 LR=Limited-resource farmers; EQIP=Environmental Quality Incentives Program.  
 Sources: ERS calculations based on USDA's pooled 2005-07 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service (farm population); USDA-NRCS contract data, fiscal 2006 (EQIP contracts).

fair number of CRP contracts, so in addition to a high percentage of enrollments, limited-resource producers are likely to hold a large number of CRP contracts in this region (USDA-FSA, 2008).

The geographic distribution of targeted farmers may be most relevant when analyzing the impact of nationally specified program requirements. For example, the “conservation access” provision of the 2008 Farm Act that establishes a 5-percent set aside of EQIP funds for beginning and socially disadvantaged farmers is a national threshold, but the provision may have a larger impact on enrollment if administered at the regional level. Nationwide, beginning farmers received more than 10 percent of EQIP funding over the 2004-06 period, but within a few regions, payments to beginning farmers fell below the 5-percent threshold.

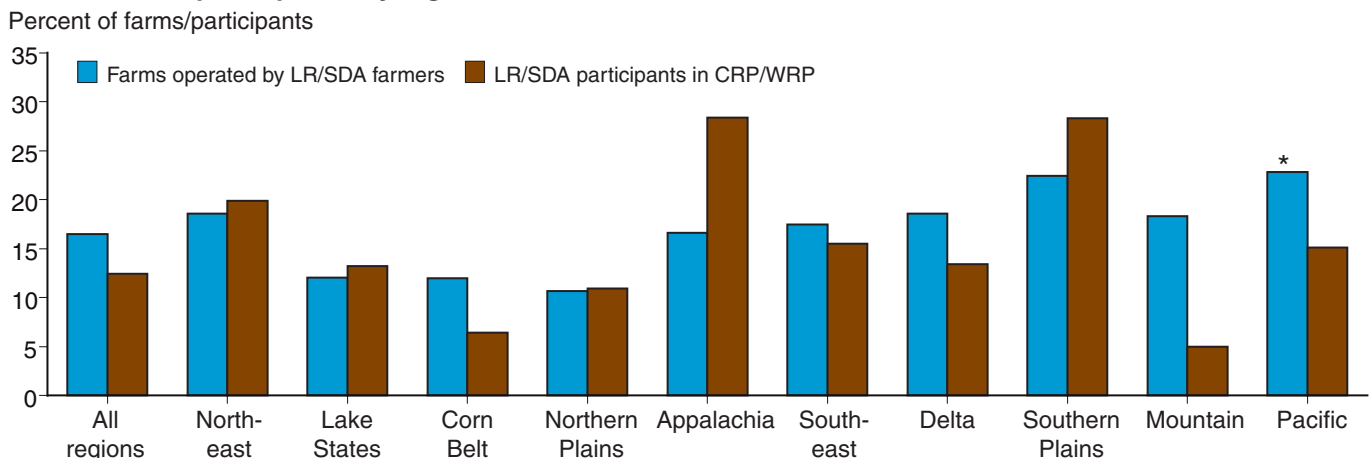
Figure 8  
**Beginning farmers/ranchers as a share of farm population and CRP/WRP participants, by region**  
Percent of farms/participants



CRP=Conservation Reserve Program; WRP=Wetlands Reserve Program.

Source: ERS calculations based on USDA's pooled 2005-07 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

Figure 9  
**Limited-resource and socially disadvantaged farmers as a share of farm population and CRP/WRP participants, by region**  
Percent of farms/participants



\* Coefficient of variation is between 25 percent and 50 percent.

LR=Limited-resource farmers; SDA=Socially disadvantaged farmers.

Source: ERS calculations based on USDA's pooled 2005-07 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

## How Do Targeted Farmers Use Conservation Programs?

Producers who participate in conservation programs employ a variety of practices to mitigate environmental problems that arise as a byproduct of agricultural production. Producers will choose the problems they want to address and practices they want to implement that best meet their needs, provide the greatest financial returns, and are likely to receive funding from conservation program managers. Examining natural resource characteristics and enrollment data highlight whether targeted farmers participate in conservation programs differently than other farmer types.

### EQIP

**Do beginning and limited-resource farmers participating in EQIP operate more environmentally sensitive land?** Some evidence suggests “yes.” While precise data on the underlying physical characteristics of land receiving treatment through EQIP-funded practices are not available, we can characterize two aspects of the land in the general vicinity of EQIP contracts: soil erodibility and proximity to quality-impaired waters.<sup>9</sup> When examining correlations between producer types and highly erodible soils, we limited our analysis to four States—Louisiana, Arkansas, Mississippi (States in the Delta region), and Alabama—because of the computational burden involved in associating soils data with EQIP contracts. These States were selected because they have both a relatively large number of EQIP contracts (each had more than 1,000 contracts signed in 2006) and a minimum of about 5 percent of contracts each with beginning and limited-resource producers.

When examining the relationship between EQIP contracts and quality-impaired waters, we used national-level data. We determined proximity of farms to streams and water bodies with pollution problems by using hydrologic data from the U.S. Environmental Protection Agency’s database on waters considered impaired under the Clean Water Act. These distance measures were used for all EQIP contracts in the continental United States.

Using 2006 EQIP contract data, our analysis reveals:<sup>10</sup>

- In the Delta region, beginning-farmer contracts were located in areas with significantly greater average percentages of highly erodible land (54 percent) compared with contracts with other farmer types (47 percent).
- For limited-resource producers in the Delta region, an average of 50 percent of nearby land was highly erodible, which was not statistically different from the percentage for other farmer types.
- Nationally, both beginning and limited-resource farmer contracts tended to be located in areas significantly closer, on average, to impaired waters than contracts with other farmer types.

These analyses suggest that of those with EQIP contracts, beginning farmers in the Delta region may be located in areas that are more marginally productive compared with other farmer types, but that limited-resource farmers may

<sup>9</sup>Geographic data on the location of farms with EQIP contracts, State-level estimates of farm size, and Soil Survey Geographic (SSURGO) data allow us to identify highly erodible soils in the “neighborhood” of EQIP contracts. Here, we define the neighborhood as the average farm size in the State using ARMS data, and we allow this average to vary by farmer type if targeted farmers have farms significantly larger or smaller than other farmer types in the State.

<sup>10</sup>All tests described here are statistically significant at a 99-percent confidence level using a two-tailed t-test.

not necessarily operate in areas with more erodible soils. Limited-resource farmers may be more likely to occupy more productive land than beginning farmers because a larger percentage of limited-resource farmers report farming as their major occupation and thus may seek to farm less highly erodible land. Producer characteristics and the underlying qualities of the land they operate can vary substantially across regions of the country, so additional analysis could determine if the correlations with erodible land in the Delta region are representative of the United States. The national analysis of a farm's proximity to impaired waters revealed that both beginning and limited-resource farmers may be operating in more environmentally sensitive areas than other farmers.

**Beginning and limited-resource farmers participating in EQIP have different conservation priorities from other participants.** When different types of producers face different environmental problems, the greatest conservation program benefits can be reaped when their particular problems are treated. The resource concerns treated with EQIP funds depend on the producer's willingness to treat the problem, as well as government priorities. Eight broad categories of resource issues are addressed through EQIP:

1. Air quality.
2. Domestic animal needs.
3. Fish and wildlife.
4. Plant productivity/quality.
5. Soil condition.
6. Soil erosion.
7. Water quality.
8. Water quantity.

Of these, the four most frequently addressed issues are domestic animal needs, plant productivity/quality, soil erosion, and water quality, which are treated by more than 85 percent of all EQIP contracts.

Of the four most commonly addressed resource issues, beginning and limited-resource farmers enrolled in 2006 were more likely to address plant productivity/quality issues and domestic animal forage and health needs compared with other participating farmer types (table 3). Limited-resource farmers appeared less likely to address water quality problems compared with beginning farmers or other farmer types, even though our analysis revealed that they tended to be located closer to quality-impaired waters than other program participants. Only 25 percent of limited-resource farmers address water quality, while 36-38 percent of beginning and other farmer types do.

These data suggest that farmer groups have different priorities for treating resource problems. They also suggest that a closer look at whether particular constraints prevent limited-resource farmers from treating water quality problems may be warranted. A similar proportion of beginning-farmer contracts treated water quality problems compared with other farmer types in EQIP, even though other farmer types are larger and face more regulatory requirements for reducing water pollution under the Clean Water Act.



Table 3

**Resource concerns addressed with EQIP contracts, by farmer status, 2006**

Concern <sup>1</sup>	Beginning farmer/rancher	Limited-resource farmer/rancher	Other farmer types <sup>2</sup>
<i>Percent of EQIP contracts addressing concern</i>			
Domestic animal forage and health needs	36	32	22
Plant productivity/quality	44	38	34
Soil erosion	34	38	37
Water quality	38	25	36
Resource concerns per contract <sup>3</sup>	1.98	1.98	1.7

EQIP=Environmental Quality Incentives Program.

<sup>1</sup>Remaining four resource concerns not listed are air quality, fish and wildlife, soil condition, and water quantity. None of these four issues are treated by more than 10 percent of contracts for each group.

<sup>2</sup>Includes all contracts held by farmers who are neither beginning nor limited-resource farmers or ranchers.

<sup>3</sup>Counts are not weighted by the number of practices implemented to treat the resource concern. If treated by multiple practices, the resource concern is counted once to eliminate the effect of multiple practice adoption choices.

Source: ERS analysis of USDA-Natural Resources Conservation Service contract data, fiscal 2006.

**Beginning farmers had more expensive EQIP contracts compared with other participating farmer types, while limited-resource farmers had less expensive contracts.** Beginning and limited-resource farmers in EQIP have somewhat different resource priorities than other participating farmer types, and costs differ as well. On average, beginning farmers enrolled in EQIP had significantly more costly contracts overall (\$33,682 compared with \$28,883, including both producer and government share of the costs) and received larger EQIP payments (the government share of the costs was \$26,646 compared with \$18,056) (table 4). Because EQIP funds a larger portion of the costs for beginning farmers to install structural practices, such as fences, waste-handling facilities, and vegetative buffers, larger payments to these producers are not surprising. Beginning farmers, however, are more likely to operate residential, retirement, or smaller farms, and a smaller proportion specialize in livestock production compared with other farmer types (see tables 1 and 2)—all characteristics that could contribute to smaller payment sizes. Livestock producers often install more expensive conservation practices to treat animal-related resource problems.

Unlike beginning farmers, limited-resource farmers in EQIP tend to have less costly contracts overall compared with other farmer types. Limited-resource farmers also tend to have smaller farms, on average, in addition to being the most likely group of farmers to face liquidity constraints (see table 2).

**Beginning and limited-resource farmers received smaller per practice EQIP payments and implemented smaller scale practices but adopted a greater number of practices.** Beginning and limited-resource farmers differ from other farmer types in terms of the sizes and types of practices funded by EQIP. The average incentive payment per management practice was significantly smaller for beginning and limited-resource farmers (table 4), due to implementation of management practices on a smaller scale. For example, beginning farmers implemented nutrient management (the most

Table 4

**Average EQIP contract and practice costs, by farmer status, 2006**

Item	Beginning farmer/rancher		Limited-resource farmer/rancher		Other farmer types <sup>1</sup>
	Value	Difference from other farmer types	Value	Difference from other farmer types	
All practices:					
Total cost of contracted practices (average \$) <sup>2</sup>	33,682	4,799**	23,242	-5,641**	28,883
Total government payments (average \$)	26,646	8,590**	19,175	1,119	18,056
Total producer expenditures (average \$)	7,035	-3,791**	4,067	-6,759**	10,827
Practices per contract	4.44	1.4**	3.70	0.66**	3.04
Cost-share practices:					
Total cost per practice (average \$) <sup>2</sup>	5,865	-1,514**	5,008	-2,370**	7,378
Government payment per practice (average \$)	4,545	390**	4,053	-101	4,155
Producer expenditures per practice (average \$)	1,320	-1,904**	955	-2,269**	3,224
Practices per contract	3.64	0.95**	3.10	0.41**	2.69
Share rate (average)	0.76	0.19**	0.82	0.25**	0.57
Management practices:					
Government payment per practice (average \$)	1,022	-856**	971	-907**	1,878
Practices per contract	1.79	0.19**	1.63	0.03	1.60

EQIP=Environmental Quality Incentives Program.

\*\* Column differences that are significant at the 95-percent level using a two-tailed t-test. Practices per contract are calculated for each group by dividing the total number of unique practices by the total number of contracts.

<sup>1</sup>Includes all contracts held by farmers who are neither beginning nor limited-resource farmers or ranchers.

<sup>2</sup>Includes government payments and producer expenditures for each practice.

Source: ERS analysis of USDA-Natural Resources Conservation Service contract data, fiscal 2006.

common management practice) on about 60 percent fewer acres, on average, compared with other participating farmer types. Beginning farmers also appear to implement this practice at a greater cost per acre.

In contrast to incentive payments for management practices, government payments for structural (cost-share) practices were larger for beginning farmers than for other participating farmer types, even though beginning farmers tended to implement these practices on a smaller scale. Beginning farmers are paid at higher cost-share rates, so the Federal Government picks up a higher portion of the total practice cost (see table 3). An analysis of structural practice sizes by farmer type confirms that, for two of the most common structural practices (e.g., fences and pipelines), beginning farmers installed significantly fewer feet of the structures. While higher per practice payments suggest that beginning farmers may not be treating environmental problems cost effectively, they may also signal that beginning farmers face more serious problems that need treatment. Both beginning and limited-resource farmers implemented significantly more cost-shared practices within a single contract—3.6 and 3.1 cost-shared practices on average, compared with 2.7 cost-shared practices by other farmer types.

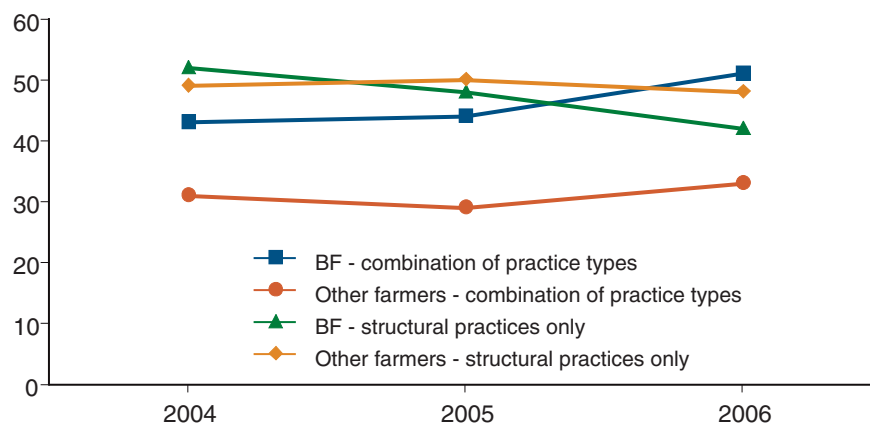
A policy designed to pay a larger portion of the costs of structural and vegetative practices for typical targeted farmers could ease financial constraints to adopting certain practices. Such a policy, however, may encourage these farmers to adopt more structural and vegetative practices than they would otherwise, simply because they face a lower out-of-pocket cost per unit of practice installed. While the policy could be a contributing factor, a variety

of other factors may explain the higher incidence of cost-shared practices in beginning and limited-resource farmer contracts. For example, differences in production and household characteristics could matter. Previous research has found that the number of structural practices installed was positively associated with land ownership (Lambert et al., 2006), and a larger percentage of beginning and limited-resource farmers tend to be full owners of the land they operate (see table 2). Differences in opportunities to receive funding for practice installation through other national and local government programs may also affect practice adoption patterns in EQIP (Feng et al., 2006; Feng et al., 2005).

Historically, not all States offered higher cost-share rates to beginning and limited-resource farmers. For example, Oregon, Missouri, and Iowa did not pay higher cost-share rates to beginning or limited-resource producers in 2006. However, the 2008 Farm Act provision mandating that all targeted farmers receive a cost-share rate at least 25 percent higher than the normal rate in EQIP (up to a maximum share rate of 90 percent) may increase their participation, particularly in States that previously offered them no cost-share advantage.

In addition to a greater number of practices, beginning and limited-resource farmers have increasingly adopted cost-shared structural practices in combination with management practices. The proportion of beginning farmers using combinations of structural and management practices in EQIP increased from 43 percent to about 51 percent during 2004-06 (fig. 10). The proportion of beginning farmers implementing strictly cost-share practices through EQIP declined from 52 percent to 42 percent over the same period. Practice adoption patterns were similar for limited-resource farmers. The practice combinations adopted by other participating farmer types, however, remained steadier over this period, with about 31 percent adopting a combination of structural and management practices and 50 percent installing strictly structural practices.

Figure 10  
**Types of practices implemented in EQIP,  
 by beginning farmer status, 2006**  
 Percent of contracts



BF=Beginning farmers.

Source: ERS analysis of USDA-NRCS contract data, fiscal 2006.

**Beginning farmers are more likely to have longer contracts than other program participants.** Other farmer types participating in EQIP are more likely to have single-year contracts (40 percent compared with 27 percent for beginning farmers). Over the 2004-06 period, more beginning farmers signed EQIP contracts that lasted at least 4 years (up to 27 percent of farmers in 2006), whereas only 17 percent of other farmer types had contracts that long. Although the 2002 Farm Act legislation reduced the minimum length of EQIP contracts from 5 years to 1 year, the reduction in length appears to be less important for beginning farmers. Shorter contract length can reduce risks from having long-term obligations to fulfill, as well as uncertainty about farm returns, which could be considered attractive benefits to all farmer types (USDA, 2003). Spreading implementation of certain practices over more contract years, however, may suit farmers who face labor or capital constraints that pose difficulties for rapid adoption.

Taken together, these findings reveal that beginning and limited-resource farmers participate in working-lands programs in different ways than other farmer types. Beginning and limited-resource farmers participating in EQIP may be located in areas that are more environmentally sensitive and, in the Delta region, more marginally productive compared with other program participants, and they address somewhat different resource issues at different costs.

## CRP and WRP

Analysis of environmental problems, resources receiving treatment, and costs incurred by participants suggest that farmer participation in land retirement may not follow the same pattern as in EQIP. CRP and WRP involve a different set of program incentives that may affect the pattern of enrollment choices.

**Targeted farmers participating in CRP/WRP tend to be concentrated in counties with the highest average percentage of cropland designated as highly erodible.** Other program participants are more likely to be located in counties with a lower percentage of land that is highly erodible. This distribution of farmers is similar to that between beginning farmers and other program participants in EQIP in the Delta region. Contract data do not identify producer status in land retirement programs, so only general characterizations are possible using ARMS and the 1997 National Resources Inventory data on the erodibility of land.

**Targeted farmers who participate in CRP may be more likely to treat soil erosion and water quality problems that provide more environmental benefits.** Targeted farmers participating in CRP tend to be concentrated in counties where participants, in general, were expected to generate the highest soil erosion reduction and water quality benefits. Approximately 44 percent of targeted farmers who participate in CRP/WRP are located in counties where participants as a whole generate the highest third of Environmental Benefit Index (EBI) scores for average soil erosion reduction benefits.<sup>11</sup> About 33 percent of other participating farmer types are located in those counties. Similarly, about 40 percent of targeted participants in CRP/WRP farm in counties with the highest third of EBI scores for average water quality benefits, compared with about 29 percent for other farmer types.<sup>12</sup>

<sup>11</sup>CRP contract data contain information on the environmental problems that participants agree to treat in that program. The EBI score associated with each contract provides a relative ranking of the anticipated benefits (effectiveness of retiring land and installing contracted practices) in treating resource problems (see box, “Major Federal Conservation Programs”). Thus, scores vary by participant, depending on the physical characteristics of the participants’ land and the effectiveness of practices that participants are willing to adopt. Although these data do not distinguish participants by farmer type and we cannot precisely identify the resource issues targeted farmers agree to treat in land retirement programs, the EBI allows us to characterize average expected benefits at a county level. For this analysis, we focus on variation in average scores for two factors that are part of the contract’s EBI: the scores associated with soil erosion reduction and water quality benefits.

<sup>12</sup>The difference between farmer types’ concentration in high-EBI-score counties was statistically tested using a binary Pearson’s chi-square test statistic. The frequency of targeted farmers in counties with the highest 10 percent, 20 percent, and 30 percent of soil erosion and water quality EBI scores was significantly different from other farmer types at a 99-percent confidence level.

Contract costs and practices adopted by targeted farmers participating in CRP and WRP share some similarities to contracts with other farmer types, but differences exist among particular groups. Beginning farmers received land retirement payments that were about \$1,400 less than payments to other farmer types. This payment difference is statistically significant, but the number of acres enrolled was not significantly different.<sup>13</sup> The opposite holds for limited-resource and socially disadvantaged farmers; average payments were not significantly different from those of other farmer types, but the average total acres enrolled is significantly larger (table 5). Differences in payment and enrolled acreage patterns could exist due to differences in characteristics between these groups of farmers (tables 1 and 2). Unlike EQIP, differences in CRP/WRP payments across producer types are not a result of special treatment, such as the differential cost-share rates offered to targeted farmers in EQIP.

On a per acre basis, targeted farmers received significantly lower CRP/WRP payments, relative to other participating farmer types (table 5); per acre payments were between 25 percent and 30 percent lower for these farmers. Several characteristics could contribute to this per acre difference, including concentrations of these farmers in the Southern Plains where payment rates are typically low (Ahearn and Newton, 2009). The differences could also arise due to underlying influences on bidding behavior. CRP and WRP allow landowners to bid down the rental payment they are willing to accept to improve their chances of enrollment. Many targeted farmers do not farm as a primary occupation and rely more heavily on off-farm sources of income (table 2). These farmers, in particular, may be willing to bid down the rental payment more than other farmer types.

Targeted farmers enrolled a larger portion of their operated acreage in CRP or WRP. The average beginning farmer had more than 54 percent of operated acreage enrolled in CRP or WRP; the average limited-resource or socially disadvantaged farmer enrolled 57 percent (table 5). A greater percentage of targeted farmers tended to be full owners and may find it easier to make decisions to retire larger amounts of land under CRP/WRP contracts of 10

<sup>13</sup>Payments in land retirement programs include rental payments (CRP), easement payments (WRP), and cost-share payments for practice installation (CRP and WRP). Payments in CRP also include the Conservation Reserve Enhancement Program (CREP). The ARMS data on conservation program payments do not readily distinguish between the three payment types. This finding is consistent with Ahearn and Newton (2009).

Table 5  
**CRP/WRP payments and acres enrolled, by farmer status, 2005-07<sup>1</sup>**

Item	Beginning farmer/rancher	Limited-resource or socially disadvantaged farmer/rancher	Other farmer types <sup>2</sup>
CRP/WRP payments:			
Total payment received (average \$)	4,645*	4,734	5,851
Payment per acre enrolled (average \$)	61.1*	61.2*	75.6
CRP/WRP acreage:			
Total acres enrolled (average)	116.5	102.5	125.8
Share of acres operated enrolled in CRP/WRP (average percent)	54.2*	57.1*	35.5

CRP=Conservation Reserve Program. WRP=Wetlands Reserve Program.

\* Significant differences compared with "other farmer types" at the 95-percent level.

<sup>1</sup>Observations from 2005-07 are pooled to increase sample size. Includes acres and payments from the Conservation Reserve Enhancement Program (CREP).

<sup>2</sup>Includes those who are not targeted farmers or ranchers. Qualitative results do not change when women are included in the definition of socially disadvantaged.

Source: ERS calculations based on USDA's pooled 2005-07 Agricultural Resource Management Survey, Phase III version 1, conducted by the National Agricultural Statistics Service and the Economic Research Service.



years or more (Lambert et al., 2007). Indeed, previous research found tenure is positively associated with the proportion of farm acreage enrolled in land retirement programs (Lambert et al., 2006). Also, many of these farmers are retired and may be more likely to enroll land in land retirement programs (Wu, 2004).

Targeted farmers do not implement significantly different types or numbers of practices in land retirement programs. Whole-field practices were the most common practices among all participants in 2001, according to the most recent data available that allows analysis of practice adoption by producer type. A larger percentage of targeted farmers retired whole fields and rehabilitated land for wildlife needs than other farmer types, and a larger percentage adopted a greater number of the listed practices, but these differences were not statistically significant (table 6).<sup>14</sup>

Table 6

**Practice adoption in CRP and WRP, by farmer status, 2001**

	Targeted farmers (A)	Other farmer types (B)	Difference (A - B)
<i>Percent of farms</i>			
Frequency of practice adoption:			
Whole-field enrollment	70.5	63.6	6.9
Grass buffers or waterways	43.9	26.8	17.1
Wildlife habitat	41.3	14.5	26.9
Other (riparian tree buffers, wetland restoration)	5.9	12.6	-6.7
Number of practices adopted:			
0	17.6	19.3	-1.7
1	35.1	53.5	-18.4
2	15.4	20.2	-4.8
3	31.9	4.4	27.5
4	0.0	2.6	2.6

Notes: No differences are significant at the 95-percent level using the delete-a-group variance calculation (Kott, 2001). Totals may not sum due to rounding.

Source: ERS calculations based on USDA's 2007 Agricultural Resource Management Survey, Phase III, conducted by the National Agricultural Statistics Service and the Economic Research Service.

<sup>14</sup>The 2001 ARMS questionnaire included questions about types of conservation practices applied. These data allow some analysis of adoption patterns of CRP-eligible practices funded through land retirement programs, although the small sample sizes limit the reliability of tests for statistically significant differences between farmer types. Sample size limitations also preclude analyzing each of the three types of underenrolled farmers separately.

## Conclusions and Policy Implications

Since 2002, some Federal conservation programs have included provisions aimed at encouraging participation by targeted farmers. Little is known, however, about whether changing the participation rates of targeted farmers might affect benefits generated by, or the cost effectiveness of, conservation programs. To improve understanding about the impact on program outcomes from improving accessibility for targeted farmers, we analyzed participation patterns in EQIP and CRP/WRP to identify whether targeted farmers differ from other farmers in the types of conservation benefits they provide and the costs of doing so. Our analyses suggest that targeted farmers may play an important role in conservation, and they participate in conservation programs in different ways from other farmers.

By several measures, beginning and limited-resource farmers appear less likely to participate in EQIP relative to their prevalence in the farmer population as a whole. Targeting these farmers for participation could provide them with greater access to conservation program funding. In land retirement programs, the relationship is less clear. Relative to their proportion in the general farm population, a smaller proportion of farms operated by targeted farmers participated in CRP and WRP. The proportion of enrolled land controlled by these farmers, however, was similar to the proportion of all farmland they operate.

Understanding participation patterns across working lands and land retirement programs is also important, particularly since the 2008 Farm Act increased funding for working-lands programs, but reduced the amount of land that could be enrolled in the CRP. If socially disadvantaged farmers are similar to beginning and limited-resource farmers and are less likely to enroll in EQIP, then a shift in conservation support to working-lands programs could reduce the overall access targeted farmers have to conservation funding. Data on socially disadvantaged farmer participation in EQIP would be needed to more definitively address this issue.

Some evidence suggests that targeted farmers participating in conservation programs, as a group, may face more pressing environmental problems than other farmers. In the Delta region, beginning farmers may be able to provide more conservation benefits than other farmer types because they are more likely to farm more erodible land. Encouraging participation by such farmers in regions where this relationship holds could increase the environmental benefits provided by conservation programs.

Choices about which environmental problems to address and which practices to adopt ultimately determine the benefits and costs of program participation. For example, limited-resource farmers are less likely to adopt practices in EQIP that address water quality problems, although they are more likely to be located in watersheds with impaired water quality. In CRP and WRP however, targeted farmers are concentrated in counties with more highly erodible cropland, and they are also concentrated in counties that provide the greatest expected levels of soil erosion reduction and water quality improvement benefits.

While targeted farmers may provide more of some benefits, it is not clear that these farmers can provide benefits more cost effectively than other farmers. Beginning farmers in EQIP tended to receive larger payments per practice, to implement smaller practices, and to incur larger per acre practice costs for nutrient management (the most common management practice) relative to other farmers. Yet, beginning and limited-resource farmers adopt greater numbers of practices in EQIP, and they have increasingly adopted cost-shared structural practices in combination with management practices. Research suggests that combinations of practices are more effective at providing environmental benefits than single practices, implying that, even if their treatment costs per acre are higher, beginning and limited-resource farmers are not necessarily providing fewer benefits than other farmers (Lerch et al., 2005; Berry et al., 2003).

Program costs per enrolled acre in CRP and WRP were smaller for targeted farmers. If lower per acre payments in CRP/WRP imply that targeted farmers may provide environmental benefits more cost effectively, targeting enrollment in land retirement programs to these producers could increase program cost effectiveness. Our analysis of costs and the distribution of contracts relative to soil erodibility suggest a closer look at the issue may be warranted. Land retirement contract data that included identifiers of farmer type along with benefits data could assess whether farmers with low-cost contracts generate the same or greater levels of benefits.

Designing programs to be broadly accessible can increase the flexibility program managers have to achieve program goals cost effectively. Quantifying the environmental benefits generated by participating farmers would be needed to determine if targeting farmers (beginning, limited resource, or socially disadvantaged) provides benefits more cost effectively.<sup>15</sup>

This analysis finds that these farmers participate in different ways than other farmers, leaving open the possibility that encouraging targeted farmers to enroll in conservation programs could result in tradeoffs with cost-effective provision of environmental benefits. These types of farmers, however, tend to operate fewer acres, so an important consideration is whether differences between these and other farmer types are due more to smaller farm size than to farmer type.

<sup>15</sup>To measure impacts on program efficiency, data on the opportunity costs of enrollment would be necessary.

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## Appendix: Data Sources

This research relies on the observation of farmer and rancher participation in conservation programs and on the ability to distinguish between different types of farmers and ranchers. We used data from several USDA sources, including annual Agricultural Resource Management Survey (ARMS), Environmental Quality Incentives Program (EQIP), and Conservation Reserve Program (CRP) contract databases.

**ARMS.** USDA's Agricultural Resource Management Survey is the only annual source of data for crop and livestock production practices, farm business financial information, and household and operator characteristics for a nationally representative sample of farmers and ranchers in the continental United States. We primarily used the 2007 ARMS (Phase III) to identify the geographic distribution of farms and ranches, their participation in Federal land retirement programs, and the characteristics of operators and households. For some analyses, ARMS data from 2005 and 2006 are pooled with 2007 data to increase sample size and improve the reliability of estimates.<sup>1</sup> Information on practices applied in CRP and Wetlands Reserve Program (WRP) uses 2001 ARMS data on conservation practices adopted by corn farms (the most recent year available). For a more detailed description of ARMS data, see <http://www.ers.usda.gov/briefing/ARMS>.

There are a few limitations to using ARMS data:

1. Not all producers surveyed in ARMS receive the same questionnaire, so some information – including separate payments received for CRP and WRP participation – is available for only part of the surveyed population. For some analyses, the limited number of useable observations prevents analyses at regional or subregional scales.
2. Operators with certain household characteristics may be under-sampled in ARMS. Such undersampling may preclude statistically reliable conclusions about targeted farmers and ranchers in some cases (data in tables are notated where large coefficients of variation suggest that reliability is suspect).
3. ARMS collects information on CRP/WRP participation, but it does not distinguish an operator with one CRP/WRP contract from an operator with multiple contracts. As a result, ARMS data will under-count conservation program contracts held by particular farmer types if participants hold several CRP or WRP contracts.

**EQIP contract data.** Information about each EQIP contract is housed in the Protracts database maintained by USDA's Natural Resources Conservation Service (NRCS). Protracts contains information about the conservation practices that farmers and ranchers agree to apply to the land, government cost-share rates and payment amounts (including incentive payments), the resource concerns that practices address, and beginning and limited-resource farmer/rancher status. We used EQIP data to review contracts for which funds were obligated in fiscal years 2004-06. These data include all EQIP practices contracted for these years, regardless of when they were applied or

<sup>1</sup> The ARMS survey asks the year that the operator began farming any operation. In 2006, this question was asked for up to three operators in only one version of the survey (version 1); previous years included the question on all versions of the survey. Counts of beginning farmer operations are potentially overestimated in 2006 if some farms with a less experienced primary operator have second or third operators that have more than 10 years of farming experience. Analysis of 2004 and 2005 data, however, show that frequency counts do not differ significantly if only the primary operator's farming experience is considered.

when payment occurred. Participants' status as socially disadvantaged was not recorded in the Protracts system over the 2004-06 period.

**CRP contract data.** CRP contract data is maintained by USDA's Farm Service Agency. These data do not include indicators of targeted farmer status, but information on location (county) and Environmental Benefits Index (EBI) scores are useful for characterizing the geographic distribution of EBI scores relative to the geographic distribution of targeted farmer participation data from ARMS.

**2007 Census of Agriculture data.** The Census of Agriculture is conducted by USDA's National Agricultural Statistics Service every 5 years. It is a complete count of U.S. farms and ranches and farm operators. The census contains information on land use and ownership, operator characteristics, production practices, income and expenditures, and more. These data are useful for summaries at a county or other aggregate level. The data include characteristics identifying certain farmer types, including beginning farmers and some groups classified as socially disadvantaged farmers. It does not allow us to identify all socially disadvantaged groups or farmers defined as having limited resources. For more information about Census of Agriculture data, see <http://www.agcensus.usda.gov/>.

**National Resources Inventory data.** The National Resources Inventory (NRI) is a survey conducted by USDA's Natural Resources Conservation Service of natural resource characteristics on non-Federal land in the United States. The inventory captures data on land cover and land use, prime farmland soils, soil erosion on cropland, wetlands, habitat types, and other resource-related attributes. We use these data to characterize the distribution of highly erodible cropland relative to the distribution of socially disadvantaged farmers.