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Structure and Finances of U.S. Farms

Family Farm Report, 2010 Edition

Robert A. Hoppe and David E. Banker

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Structure and Finances of U.S. Farms
Family Farm Report, 2010 Edition

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Abstract

Most U.S. farms—98 percent in 2007—are family operations, and even the largest farms are predominantly family run. Large-scale family farms and nonfamily farms account for 12 percent of U.S farms but 84 percent of the value of production. In contrast, small family farms make up most of the U.S. farm count but produce a modest share of farm output. Small farms are less profitable than large-scale farms, on average, and their operator households tend to rely on off-farm income for their livelihood. Generally speaking, farm operator households cannot be characterized as low-income when both farm and off-farm income are considered. Nevertheless, limited-resource farms still exist and account for 3 to 12 percent of family farms, depending on how "limited-resource" is defined.

Keywords: Contracting, family farms, farm businesses, farm financial performance, farm-operator household income, farm operators, farm structure, farm type, Government payments, limited-resource farms, metropolitan farming, million-dollar farms, small farms, tenure.

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See the companion brochure, *America's Diverse Family Farms, 2010 Edition* (EIB-67).

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Summary

Broad descriptions of farms based on U.S. averages can mask variation among different sizes and types of farms. Small family farms dominate the farm count and hold most farm assets, including farmland. But large-scale family farms and nonfamily farms account for the bulk of farm production. Averages such as sales per farm, therefore, can be misleading. Information on the different kinds of farms—and the farmers who operate them—is important for understanding the economic well-being of farm households and the impact of farm policy.

What Is the Issue?

Agricultural policymakers require information on how U.S. farming is organized. USDA's Economic Research Service (ERS) produces a periodic report with that information. The *Family Farm Report, 2010 Edition,* is the most recent in the series, providing agricultural policymakers with an accurate, detailed, and unbiased source of information on the structure and finances of U.S. farms, including the relationship of farm size and type to agricultural production, financial performance, sources of farm household income, and the extent of operators' off-farm work. The report provides a sense of the financial position of family farms in general and for different types of family farms.

What Are the Major Findings?

Small family farms—annual sales less than $250,000—made up 88 percent of U.S. farms in 2007. They also held about 64 percent of all farm assets, including 63 percent of the land owned by farms. As custodians of the bulk of farm assets—including land—small farms have a large role in natural resource and environmental policy. Small farms accounted for 76 percent of the land enrolled by farmers in USDA land-retirement programs, largely in the Conservation Reserve Program.

Nevertheless, very large family farms and nonfamily farms produce the largest share of agricultural output. Large-scale family farms (annual sales of $250,000 or more), plus nonfamily farms, made up only 12 percent of U.S. farms in 2007 but accounted for 84 percent of the value of U.S. production. Although small family farms produced only 16 percent of agricultural output, they made more significant contributions to the production of specific commodities: hay, tobacco, cash grains and soybeans, and beef cattle.

For the most part, large-scale farms are more viable businesses than small family farms. The average operating profit margin and rates of return on assets and equity for large farms (annual sales of $250,000 to $499,999) and very large farms (annual sales of $500,000 or more) were all positive in 2007, and most of these farms had a positive operating profit margin. Small farms were less viable as businesses. Average operating profit margin and rates of return on assets and equity were negative for most small-farm types. Nevertheless, some farms within each small-farm type (see table for farm types) had relatively high operating margins of at least 20 percent.

Distribution of farms, total production, and assets by farm type, 2007

Farm type	Farms	Value of production	Farm assets
		Percent of U.S. total	
Small family farms:[1]			
Retirement	18.4	1.6	12.9
Residential/lifestyle	45.1	4.2	26.0
Farming-occupation			
Low-sales	19.8	4.0	17.3
Medium-sales	5.1	6.6	7.9
Large-scale family farms:[1]			
Large family farms	4.3	12.2	9.3
Very large family farms	5.0	53.7	20.1
Nonfamily farms[1,2]	2.4	17.7	6.6

[1]Small farms have sales less than $250,000; large-scale farms have sales of $250,000 or more; no sales limit for nonfamily farms.
[2]Nonfamily farms include any farm where the majority of the business is not owned by the operator and individuals related to the operator.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Small-farm households rely on off-farm income. Given small farms' poor financial performance, why do so many continue to exist? Small-farm households typically receive substantial off-farm income and do not rely primarily on their farms for their livelihood. Most of their off-farm income is from wage-and-salary jobs or self-employment. Households operating retirement farms, however, receive most of their off-farm income from such sources as Social Security, pensions, dividends, interest, and rent.

Farm operator households, generally speaking, cannot be considered low-income, but limited-resource farms persist. Median household income for only two types of farm households—those operating retirement farms or low-sales farms (annual sales less than $100,000)—was below the U.S. median in 2007. Limited-resource farms, however, make up between 3 and 12 percent of all farms, depending on how "limited-resource" is defined. (The definitions are based on different—but low—levels of farm sales, operator household income, and farm assets or operator household net worth.)

Different types of Government payments go to different types of farms. The distribution of commodity-related program payments is roughly proportional to the production of program commodities. Medium-sales (annual sales of $100,000 to $249,999) and large-scale farms received 76 percent of commodity-related Government payments in 2007. Likewise, large-scale farms received 60 percent of the payments from working-land programs, which target production indirectly by focusing on land in production. In contrast, land-retirement programs target environmentally sensitive land rather than production. The bulk of land-retirement payments (73 percent) went to retirement, residential/lifestyle, and low-sales small farms. However, most farms (61 percent) received no Government payments at all and were not directly affected by farm program payments.

How Was the Study Conducted?

The 2007 Agricultural Resource Management Survey (ARMS) is the main source of data in the *Family Farm Report, 2010 Edition*. ARMS is an annual survey designed and conducted by ERS and the National Agricultural Statistics Service (NASS), another USDA agency. In addition to ARMS, various censuses of agriculture and ERS farm sector income estimates are used in this report, particularly in the analysis of long-term trends. The report uses the farm classification system developed by ERS to examine farm structure in the United States.

Introduction

The *Family Farm Report, 2010 Edition* presents comprehensive information about the structure and finances of the diverse types of family farms in the United States. This report—like earlier editions—covers a variety of standard topics, such as the number and size of U.S. farms, the characteristics of their operators, and the finances of farm businesses and the households that operate them. The report also presents materials on the geography of farming, aging operators and the future of farming, and limited-resource farmers.

The diversity of U.S. farms is partly attributable to the official farm definition, which includes farms that are very small in terms of sales of farm products. A farm is currently defined—for statistical purposes—as any place from which $1,000 or more of agricultural products (crops and livestock) were sold or normally would have been sold during the year under consideration. This definition has been in place since August 1975, by joint agreement among USDA, the Office of Management and Budget, and the U.S. Census Bureau (Sommer et al., 1998, p. 4).

USDA's Economic Research Service (ERS) developed a farm classification (see box, "Farm Types, 2007") to group farms—particularly family farms—

Farm Types, 2007

Small family farms (gross farm sales less than $250,000)[1]	Large-scale family farms (gross farm sales of $250,000 or more)
Retirement farms. Small farms whose operators report they are retired, although they continue to farm on a small scale. These operations sell enough farm products (at least $1,000 worth) to qualify as farms under the current farm definition.[2] **Residential/lifestyle farms.** Small farms whose operators report a major occupation other than farming.[3] The category also includes a small number of farms—8 percent of the group in 2007—whose operators are not in the labor force. **Farming-occupation farms.** Small family farms whose operators report farming as their major occupation.[3] • **Low-sales farms.** Gross sales less than $100,000. • **Medium-sales farms.** Gross sales between $100,000 and $249,999.	**Large family farms.** Farms with gross sales between $250,000 and $499,999. **Very large family farms.** Farms with gross sales of $500,000 or more.
	Nonfamily farms
	Nonfamily farms. Any farm where the operator and persons related to the operator do not own a majority of the business.

Note: Limited-resource farms are no longer a separate category in the classification, starting with the 2005 Agricultural Resource Management Survey.
[1]USDA's National Commission on Small Farms selected $250,000 in gross sales in a given year as the cutoff between small and large-scale farms (USDA, NCSF, 1998, p. 28).
[2]A farm is defined as any place that produced and sold—or normally would have produced and sold—at least $1,000 of agricultural products during a given year (USDA, NASS, 2008).
[3]Major occupation is defined as the occupation at which operators spent the majority of their work time.

into more homogeneous categories based primarily on annual gross sales of the farm, major occupation of the operator, and family/nonfamily ownership of the farm. Use of these homogeneous groups in this report enables a clearer picture to emerge of the status of farms in the United States today.[1]

Two changes were made to the ERS farm classification since the previous *Family Farm Report* was released in 2007. First, the classification now incorporates the refined ERS definition of "family farm," which focuses on the share of the farm business held by farm operators and their families. The refined definition had a minor effect on the share of farms classified as family farms (see box, "What Is a Family Farm?").

Second, limited-resource farms are now analyzed separately from the classification, not as a category in the classification. The USDA-wide definition of limited-resource farms—based on farm sales and operator household income in both the current and previous years—is inconsistent with the rest of the classification, which is based on farm sales and the operator's occupation in the current year. This report provides more detailed information about limited-resource farmers by analyzing them separately. The analysis appears as a special feature, "Limited-Resource Farmers—Who Are They?" This is the third issue of the *Family Farm Report* series to feature a special topic. Previous special features were "Multiple-Operator Farms" (Hoppe and Banker, 2006) and the "The Shift to Larger Farms" (Hoppe et al., 2007).

[1]USDA's National Agricultural Statistics Service also has released a farm classification, published in the 2007 Census of Agriculture. For more information, see "Appendix I: Comparing the Census and ERS Farm Classifications."

What Is a Family Farm?

There is no hard-and-fast definition of the "family farm." The ideal definition would allow changes in the way in which operators structure their farm businesses as they respond to changes in technology, the marketplace, and Government policies but still capture the general concept of a family farm in which a family maintains majority control and ownership.

The definition of family farm used at the Economic Research Service (ERS) has been refined over time. The current definition—introduced in the 2005 Agricultural Resource Management Survey (ARMS)—includes any farm where the majority of the business is owned by the operator and individuals related to the operator by blood or marriage, including relatives who do not reside in the operator's household. Nonfamily farms include any farm where the operator and relatives do not own a majority of the business. For example, nonfamily farms include farms operated by publicly held corporations, but also farms equally owned by three unrelated business partners, as well as farms operated by a hired manager for a family of absentee owners.

Immediately prior to the implementation of the current definition, family farms were defined largely on the basis of business organization. Family farms included any farm organized as a sole proprietorship, partnership, or family corporation. Family farms excluded farms organized as cooperatives or nonfamily corporations, as well as farms operated by a hired manager or held in estates or trusts. Survey respondents, however, found the terms "family corporation" and "hired manager" to be ambiguous. Redesigning the definition to focus on the ownership of the farm simplified the questionnaire for respondents and made the family farm definition more precise.

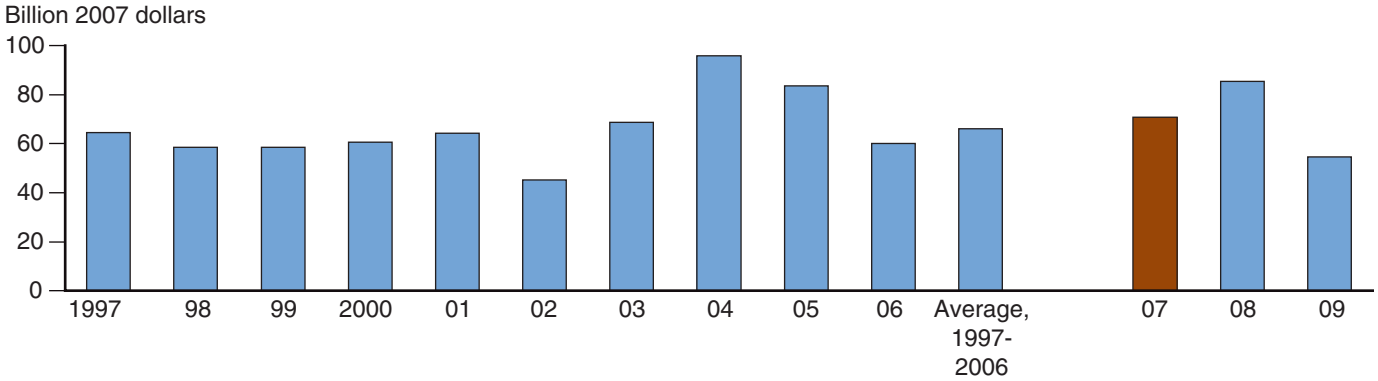
The change in the definition had a minor impact on the share of farms classified as family farms. In 2007, 98 percent of farms in ARMS were classified as family farms under the current definition, the same percentage typically classified as family farms prior to 2005 under the previous definition.

Information in this box is drawn from "Family Farm" in the ERS briefing room on Farm Household Economics and Well-Being at: www.ers.usda.gov/briefing/well-being/glossary.htm#familyfarm.

As in previous issues, the Agricultural Resource Management Survey (ARMS)—an annual farm survey—is the main source of data in the *Family Farm Report, 2010 Edition*. ARMS is jointly designed and conducted by ERS and the National Agricultural Statistics Service (NASS), another USDA agency. (For more information about ARMS, see "Appendix II: The Agricultural Resource Management Survey.") The report also draws on various censuses of agriculture and the ERS farm sector accounts, particularly when following trends over long periods of time.

This report depicts farm structure and financial status as of 2007, the most recent year for which ARMS data were available at the time of writing. Using the 2007 ARMS also allows comparability with the 2007 Census of Agriculture, released in early 2009. The year 2007 was above average for farming—as measured by ERS farm sector income estimates—reflecting sharply increasing commodity prices by the end of 2007 that continued into late 2008 (Harris et al., 2008, p. 1). Real net farm income was $71 billion in 2007 (fig. 1), about 18 percent higher than the previous year and 7 percent higher than the average for the previous 10 years. Net farm income increased another 20 percent in 2008, but declined to $55 billion in 2009. Real net farm income is expressed in 2007 dollars here, using the Gross Domestic Product chain-type price index to adjust for price changes.

Figure 1
Real net farm income, 1997 to 2009
Net farm income was 7 percent higher in 2007 than the average for the previous 10 years and continued to increase into 2008



Note: Deflated with the Gross Domestic Product chain-type price index.
Source: USDA, Economic Research Service, U.S. and State Farm Income Data (the farm sector accounts), www.ers.usda.gov/data/farmincome/finfidmu.htm.

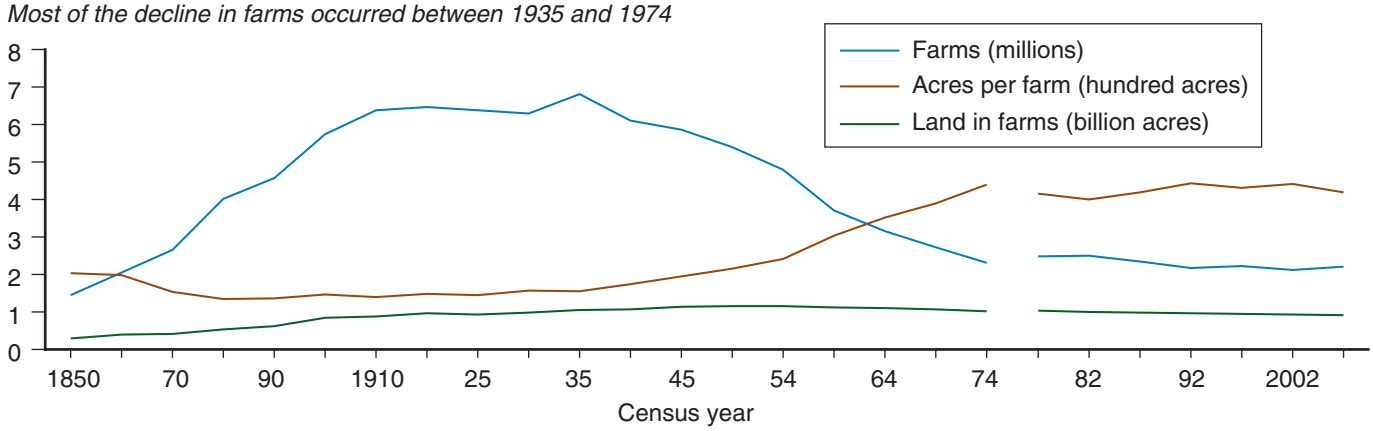
U.S. Farms: Numbers, Size, and Other Characteristics

After peaking at 6.8 million farms in 1935, the number of U.S. farms fell sharply until the early 1970s (fig. 2). Falling farm numbers during this period reflect growing productivity in agriculture and increased nonfarm employment opportunities (Hoppe, et al., 2007, p. 4). Growing productivity led to excess capacity in agriculture, farm consolidation, and farm operators leaving farming to work in the nonfarm economy. The decline in farm numbers slowed in the 1980s and essentially stopped in the 1990s.

The greater stability in farm numbers, however, masks shifts in the size distribution of farms. For example, though farm numbers stabilized from 1978 to 2007, the number of farms operating fewer than 70 acres increased 12 percentage points, the number of "thousand-acre farms" increased 1 percentage point, and the number of farms in all acreage classes in between decreased (fig. 3, top panel). The shift to farms with more than 1,000 acres is more marked when examined in terms of these operations' land in farms (up 12 percentage points) or market value of sales (up 15 percentage points) (middle and bottom panel, respectively). Note that farms do not necessarily own all the land they operate; they can also rent land. For example, a farm operating 1,000 acres could own 500 acres and rent 500 acres, or even own no land at all and rent 1,000 acres.

The shifts in farms and acres among acreage classes between 1978 and 2007 are reallocations of a fairly stable farm count and total acres of farmland (table 1). Sales grew more rapidly during the period, however, reflecting more output per hour of labor. A recent ERS study found that two-thirds of the growth in U.S. agricultural output per hour between 1981 and 2004

Figure 2
Farms, land in farms, and average acres per farm, 1850-2007
Most of the decline in farms occurred between 1935 and 1974



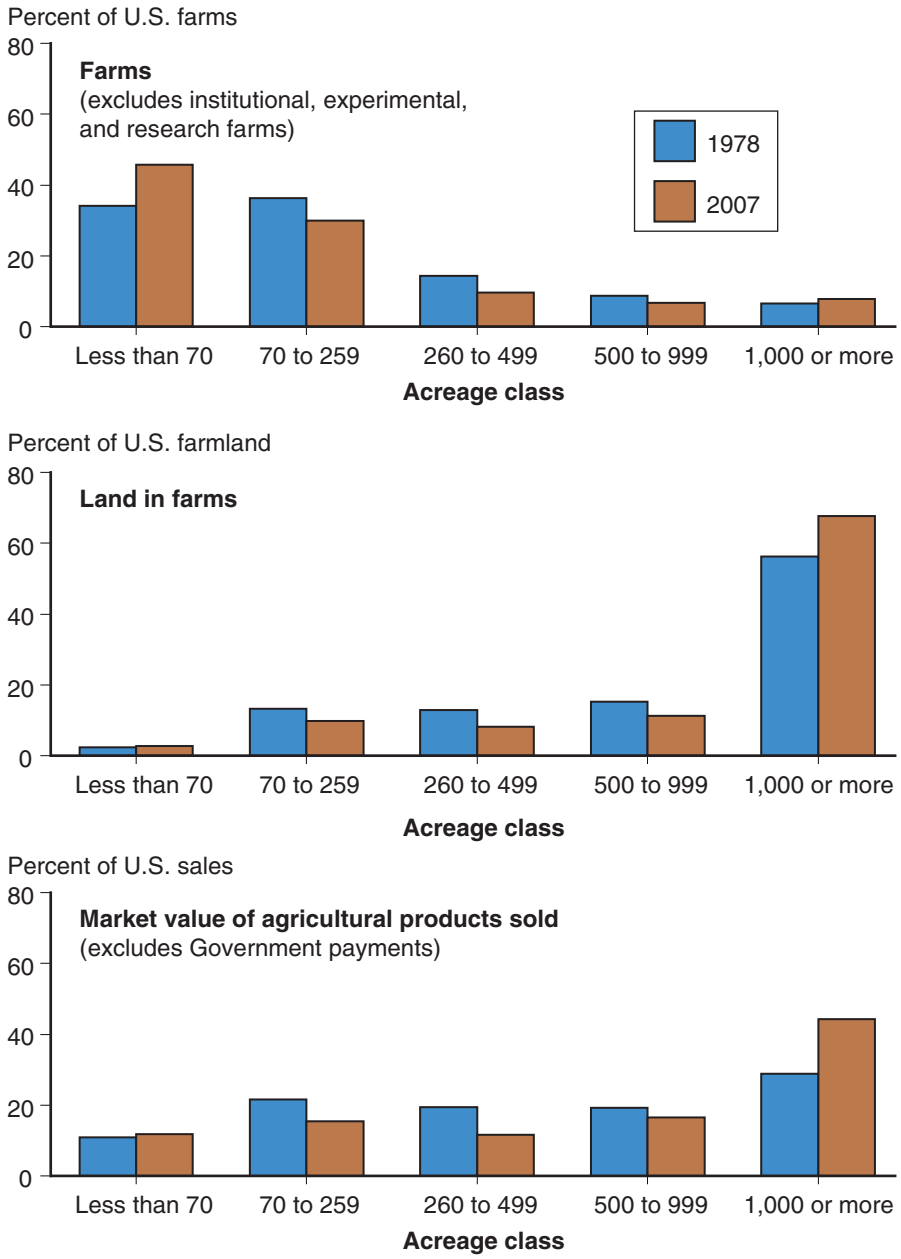
Note: The break in the lines after 1974 reflects the introduction of an adjustment to estimates of the farm count and land in farms. Beginning in 1978, the data are adjusted to compensate for undercoverage by the Census of Agriculture. For more information, see Allen (2004).
Source: USDA, Economic Research Service, compiled from Census of Agriculture data.

came from technological change, such as biotechnology, improved animal husbandry, and improvements in machinery and chemicals (Fuglie et al., 2007). Larger farms—like thousand-acre farms—were better able to take advantage of these technological developments and increased their share of sales.

Figure 3

Farms, land in farms, and sales by acreage class, 1978 and 2007

Land and sales shifted to farms with at least 1,000 acres



Source: USDA, Economic Research Service, compiled from Census of Agriculture data (U.S. Department of Commerce, U.S. Census Bureau, 1981; USDA, NASS, 2009).

Table 1
Farms, land in farms, and sales, 1978 and 2007

Item	Year 1978	Year 2007	Pct. change (annualized)
Farms (number)	2,476,340	2,204,792	-0.6
Land in farms (million acres)	973.7	922.1	-0.3
Market value of agricultural products sold (billion 2007 dollars)[1]	176.3	297.2	2.8

Notes: Abnormal farms—defined as institutional, experimental, and research farms—are excluded. The count of farms from the census is slightly higher than the count from the Agricultural Resource Management Survey (ARMS) because the census includes farms in Alaska and Hawaii while ARMS excludes them. For more information, see Appendix II.

[1]Sales are expressed in constant 2007 dollars, using the Producer Price Index for Farm Products to adjust for farm prices. Sales exclude Government payments.

Source: USDA, Economic Research Service, compiled from Census of Agriculture data (U.S. Department of Commerce, U.S. Census Bureau, 1981; USDA, National Agricultural Statistics Service, 2009).

Share of Farms, Production, and Assets

Three features of U.S. farm structure stand out (fig. 4). First, small family farms make up 88 percent of all U.S. farms. Second, large-scale family farms—only 9 percent of all farms—account for a disproportionately large, 66-percent share of the value of production. Third, farming is still an industry of family businesses. Ninety-eight percent of farms are family farms, and they account for 82 percent of production. Only 2 percent of U.S farms are nonfamily farms, accounting for the remaining 18 percent of production.

Despite their 16-percent share of total farm production, small farms produce a larger share of specific commodities: 23 percent of the value of production for cash grains and soybeans, 51 percent for hay, 34 percent for tobacco, and 22 percent for beef. At the other extreme, small farms contribute a miniscule share to the value of production for hogs (5 percent) and poultry (3 percent). The largest share of small-farm production occurs among medium-sales farms, which account for 7 percent of total U.S. production.[2]

The share of assets and land held by small farms is also substantially more than indicated by their small share of production. Small farms hold 64 percent of all farm assets, including 63 percent of the land owned by farms (fig. 5). Because of their large land holdings—in aggregate—small farms are important in conservation efforts. Small farms account for 76 percent of the land farmers enroll in USDA land-retirement programs: the Conservation Reserve Program (CRP), the Conservation Reserve Enhancement Program (CREP), the Wetlands Reserve Program (WRP), and the Farmable Wetlands Program (FWP).

Farm Size

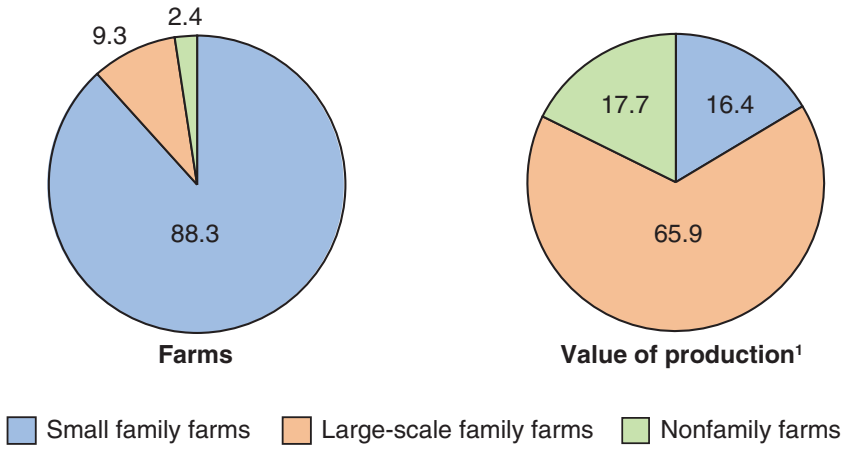
Variation in farm size—whether measured in sales, acres, or labor use—helps explain the distribution of agricultural production. The 1.4 million retirement and residential/lifestyle farms account for only 6 percent of production because most of these farms are very small (table 2). Seventy-six

[2]This report measures farm size using gross farm sales, or the revenue associated with all the production of the farm, including the production accruing to share landlords and contractors. Other measures of sales exist, however, and the small-farm share of the value of production depends on the sales measure used. For example, if the measure used is gross cash farm income (GCFI)—total revenue received by the farm business alone—the small-farm share of production increases to 22 percent. This increase is mostly due to an expansion of the number of poultry farms classified as small when GCFI is used. For more information, see Hoppe et al. (2010, pp. 3-4).

percent of the farms in both groups have annual sales of less than $10,000, including 31 percent with sales of less than $1,000.

Farms with less than $1,000 in sales do not appear to satisfy the $1,000 sales requirement in the current farm definition. However, these "point farms" are included in the farm count because they might normally have sales that high and satisfy the sales requirement. If a farm does not have $1,000 in sales, a

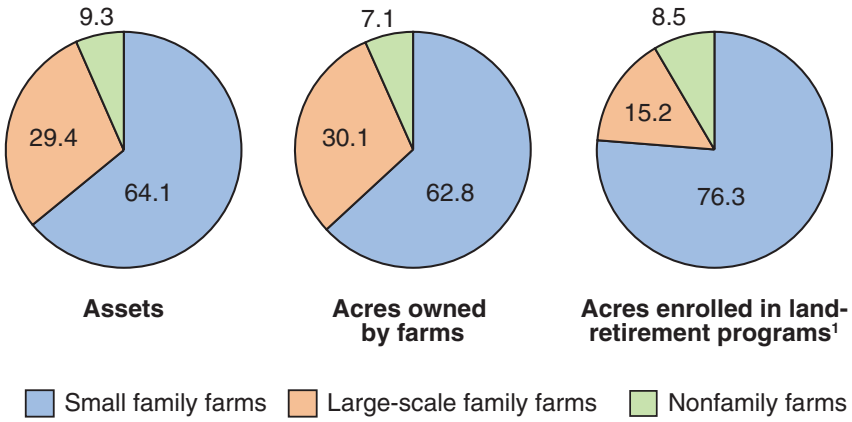
Figure 4
Share of total farms and value of production by farm type, 2007
Large-scale family farms account for 66 percent of production



[1]The value of production measures the value of commodities produced in a given year, without the effects of inventory change. It is calculated by multiplying the quantity of each commodity produced by the price of the commodity.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Figure 5
Share of farm assets, acres owned by farms, and acres enrolled in land-retirement programs[1] by farm type, 2007
Small farms account for most farm assets



[1]Conservation Reserve Program, Conservation Reserve Enhancement Program, Wetlands Reserve Program, and Farmable Wetlands Program.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Table 2

Sales class, land operated, and labor used by farm type, 2007

Item	Small family farms: Retirement	Small family farms: Residential/ lifestyle	Small family farms: Farming-occupation: Low-sales	Small family farms: Farming-occupation: Medium-sales	Large-scale farms: Large	Large-scale farms: Very large	Nonfamily farms	All farms
				Number				
Total farms	403,828	989,830	434,599	111,389	93,601	110,152	53,393	2,196,791
				Percent of U.S. total				
Distribution of:								
Farms	18.4	45.1	19.8	5.1	4.3	5.0	2.4	100.0
Value of production	1.6	4.2	4.0	6.6	12.2	53.7	17.7	100.0
				Percent of group				
Sales class:								
Less than $1,000[1]	31.4	31.2	17.1	na	na	na	11.1	23.5
$1,000 to $9,999	44.5	44.4	31.6	na	na	na	26.3	35.1
$10,000 to $49,999	17.0	18.1	32.0	na	na	na	20.2	18.1
$50,000 to $99,999	5.3	3.8	19.3	na	na	na	9.7	6.8
$100,000 to $174,999	1.2	1.8	na	58.8	na	na	5.6	4.1
$175,000 to $249,999	0.7	0.7	na	41.2	na	na	3.0	2.6
$250,000 to $499,999	na	na	na	na	100.0	na	6.2	4.4
$500,000 to $999,999	na	na	na	na	na	63.0	5.1	3.3
$1,000,000 to $4,999,999	na	na	na	na	na	34.0	9.3	1.9
$5,000,000 or more	na	na	na	na	na	3.0	3.5	0.2
				Acres per farm				
Acres operated:								
Mean	174	148	294	980	1,398	2,132	1,099	400
Median[2]	69	58	110	414	724	1,062	188	8
				Annual person equivalents of labor per farm				
Average person equivalents of labor[3,4]	0.695	0.821	1.408	2.533	3.107	8.357	11.974	1.747
				Percent of total hours				
Share of hours worked by:[5]								
Principal operator[4]	69.3	56.4	66.0	56.6	47.6	17.8	6.5	40.7
Spouse[4]	12.5	17.4	16.1	13.8	12.8	4.1	0.6	10.2
Hired labor	5.3	12.5	5.8	13.4	21.4	60.7	81.5	34.7

na = Not applicable.

[1]Point farms have sales less than $1,000 (including Government payments) but are still considered farms because they would be expected to normally sell at least $1,000.

[2]Midpoint of the distribution of farms by acres operated. Half the farms in a group operate more acres than the median, while the other half operate fewer acres than the median.

[3]One annual person equivalent equals 2,000 hours of labor, or 50 weeks per year times 40 hours per week.

[4]Includes paid and unpaid hours.

[5]Shares worked by other operators, unpaid workers, and contract labor are not shown separately.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

"point system" assigns values for acres of various crops and head of livestock to estimate normal sales. Point farms are farms with less than $1,000 in sales but points worth at least $1,000.[3]

[3]For more information, see "What is the Definition of a Farm?" on the USDA, National Agricultural Statistics Service website at: www.agcensus.usda.gov/help/faqs/2002_census/index.asp#1.

Nonfamily farms are also concentrated in the lower sales classes. Fifty-eight percent have sales less than $50,000, and 76 percent have sales less than $250,000 and would qualify as small farms. The only criteria necessary to be classified as a nonfamily farm is that the operator and the operator's relatives do not own a majority of the business. Thus, nonfamily farms include more than large farms operated by publicly held corporations. They also include, for example, a farm equally owned by unrelated business partners, as well as farms operated by hired managers unrelated to the owners. Only 15 percent of nonfamily farms are corporations, and only 11 percent of these corporations have more than 10 stockholders.

Median Acres Operated

The average (or mean) acreage operated is fairly low for both retirement and residential/lifestyle farms, 174 and 148 acres, respectively. Average acreage operated, however, may not best indicate the size of a typical farm in a group because a few high-acreage farms may raise the average well above the acreage operated on most farms. Median acreage operated—the midpoint of the distribution of farms by acres operated—is a better indicator. Median acreage operated is 69 acres for retirement farms and 58 acres for residential/lifestyle farms, which means the typical farm in both of these groups is even smaller than suggested by the groups' average acreages.

Median acres operated was 110 acres among low-sales farms, nearly double the medians for retirement or residential/lifestyle farms. Median acreage is much larger for medium-sales small farms and large-scale farms, ranging from 414 to 1,062 acres. The high average acreage for nonfamily farms (1,099 acres) reflects a small share of farms in the group with very large acreages. In contrast, the median for this group is about one-sixth as large—188 acres—which is more consistent with the 76-percent share of nonfamily farms with annual sales less than $250,000.

Million-Dollar Farms

Thirty-seven percent of very large family farms and 13 percent of nonfamily farms are "million-dollar farms" with annual sales of $1 million or more. There are only 47,600 million-dollar farms—2 percent of all U.S. farms—but they account for 53 percent of production. They dominate the production of five major farm products: high-value crops (vegetables, fruits and tree nuts, and nursery and greenhouse products), hogs, dairy, poultry, and beef. The largest million-dollar farms—those with sales of at least $5 million—by themselves account for 35 to 45 percent of the production for beef cattle (largely in feedlots), high-value crops, and milk. For more information about million-dollar farms, see box "Million-Dollar Farms" or *Million-Dollar Farms in the New Century* (Hoppe et al., 2008).

Million-Dollar Farms

Approximately 47,600 U.S. farms have annual sales of $1 million or more. Most million-dollar farms have annual sales between $1 million and $4,999,999, but 11 percent—5,200 farms—sell at least $5 million. A large majority of million-dollar farms (86 percent) are family farms. Family farms account for a smaller share (64 percent) of farms with annual sales over $5 million.

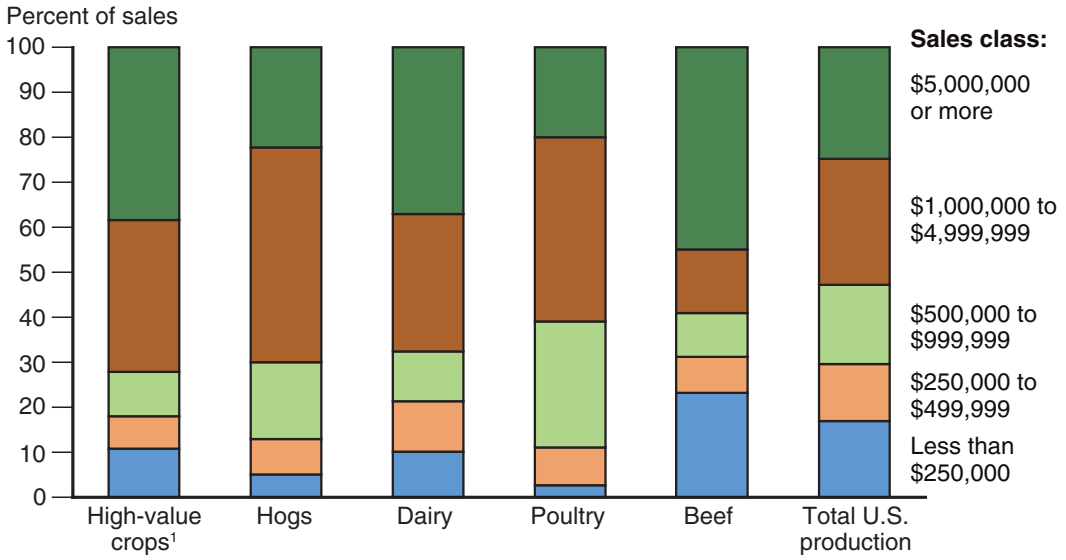
Million-dollar farms make up about 2 percent of all U.S. farms, but they account for 53 percent of the value of production (see figure). They also produce approximately 60 to 70 percent of high-value crops, hogs, dairy, poultry, and beef. The largest million-dollar farms—those with sales of at least $5 million—account for 35 to 45 percent of beef (largely in feedlots), milk, and high-value crops.

As one might expect from the figure, 71 percent of farms with more than $5 million in sales specialize in beef (largely in feedlots), high-value crops, or dairy. The prevalence of these specializations among $5 million farms suggests economies of scale persist in the production of high-value crops, finished beef cattle, and milk, even when annual sales pass $5 million.

Consider dairy production, for example. Costs of production fall rapidly with herd size. Total costs per hundredweight for farms with 1,000 or more cows—which includes $5 million dairies—are less than half those for farms with fewer than 50 cows (see table). The biggest cost advantages for large dairies are in overhead costs, since these operations can use capital and labor more intensively (MacDonald et al., 2007, p. 32).

Note that gross farm sales is used to measure farm size in this report. Farm size, however, could be measured in terms of gross cash farm income (GCFI) or the gross revenue of the farm. The main difference between the two measures is that the gross value of sales includes the value of commodities removed under production contracts, while GCFI excludes these removals, since the contractor—rather than the farm—owns the commodity under production.

Value of production of selected commodities by sales class, 2007



[1]Vegetables, fruits and tree nuts, and nursery and greenhouse products.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Full economic costs of milk production by herd size, 2005

Type of cost	Number of dairy cows[1]					
	Less than 50	50 to 99	100 to 199	200 to 499	500 to 999	1,000 or more
	Dollars per hundredweight					
Full economic costs	30.09	25.50	20.82	17.92	16.07	13.59
Operating costs[2]	12.30	12.94	11.51	11.31	1.07	9.74
Allocated overhead[3]	17.79	12.56	9.31	6.61	5.00	3.85

Note: Organic operations are excluded.

[1]All dairy cows, including dry cows, but excluding calves, heifers, and bulls.

[2]Largely feed costs, purchased and homegrown.

[3]Includes hired labor, opportunity cost of unpaid labor, opportunity cost of land, taxes and insurance, and general overhead.

Source: MacDonald et al. (2007, p. 32).

For most commodities, the distribution of production by farm size is similar using either measure. Poultry farms, however, will frequently be classed as large farms using gross farm sales, but as small farms using GCFI (Hoppe et al., 2010, pp. 3-4). Using GCFI instead of gross sales decreases the share of poultry produced on million-dollar farms to 20 percent while increasing the share of poultry produced by small farms to 55 percent, if small is defined as less than $250,000 in GCFI. The size classification of poultry farms is somewhat ambiguous. Many poultry farms are small businesses that feed out large numbers of birds owned by contractors.

Labor Hours

One measure of annual labor use is the "person equivalent," defined as 2,000 hours, or 40 hours of work per week for 50 weeks per year (see table 2). Residential/lifestyle and retirement farms use the least labor, less than 1 person equivalent. Labor use jumps to 1.4 person equivalents for low-sales farms and increases with sales to 8.4 person equivalents for very large farms. Nonfamily farms use 12 person equivalents, on average. This estimate, however, reflects heavy labor use by relatively few farms. Only 14 percent of nonfamily farms use more than 5 person equivalents of labor, while 47 percent use less than 1.

Specialization

Beef cattle are a common specialization among small farms, accounting for about one-third of retirement, residential/lifestyle, and low-sales farms (table 3). There actually are three basic types of beef cattle enterprises (Cash, 2002, p. 21). Cow-calf operations produce and sell calves. Stocker operations buy the calves and pasture them to gain weight. These operations then finish the cattle themselves on grain or sell them as yearlings to fed-cattle operations. Fed-cattle operations place yearlings in feedlots until they reach slaughter weight and ship them to packers. Cow-calf enterprises are typically found on small farms.

Table 3
Farm specialization by farm type, 2007

	Small family farms							
			Farming-occupaton					
Item	Retirement	Residential/ lifestyle	Low-sales	Medium-sales	Large-scale farms: Large	Large-scale farms: Very large	Nonfamily farms	All farms
				Number				
Total farms	403,828	989,830	434,599	111,389	93,601	110,152	53,393	2,196,791
				Percent of group				
Commodity specialization:[1]								
Cash grains[2]	5.6	8.8	14.4	41.3	48.3	35.5	18.0	14.2
Other field crops[3]	36.8	21.9	19.6	6.7	7.5	8.4	25.1	22.2
High-value crops[4]	5.0	4.4	8.4	9.7	7.8	10.3	15.3	6.3
Beef	31.6	33.8	33.4	19.4	11.8	10.3	22.2	30.2
Hogs	d	d	d	d	2.2	6.6	1.4	1.3
Dairy	d	d	2.9	15.8	14.2	10.4	2.7	2.7
Poultry	d	1.0	d	d	6.2	15.7	2.0	1.8
Other livestock[5]	19.6	28.8	20.3	3.0	2.1	2.7	13.3	21.3

d = Data suppressed due to insufficient observations.

[1]Commodity that accounts for at least half of the farm's value of production.

[2]Includes barley, corn, rice, grain sorghum, soybeans, wheat, oats, and general cash grains where no single cash grain accounts for the majority of production.

[3]Tobacco, peanuts, cotton, sugar beets, sugarcane, corn for silage, sorghum for silage, hay, canola, and general crops, where no single crop accounts for the majority of production. Also includes farms with all cropland in land-retirement programs.

[4]Vegetables, fruits and tree nuts, and nursery and greenhouse products.

[5]Includes sheep, lambs, wool, goats, goats' milk, mohair, horses, ponies, mules, donkeys, bees, honey, aquaculture, mink, rabbits, other fur-bearing animals, bison, deer, elk, llamas, etc. Also includes farms where no single livestock species accounts for the majority of production.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Cow-calf enterprises offer three advantages to operators of small farms. First, cattle are less labor-intensive than many other enterprises, which may be attractive to an operator who is retired or holds a full-time job off the farm (Cash, 2002, p. 21). Second, cattle enterprises tend to be low-cost, which limits cash requirements. Third, under the existing tax code, losses from farming can be written off against income from other sources (Durst, 2009, pp. 4-6). Producing calves allows farmers to group their expenses and sales in different years to generate small profits in some years and large losses in others (Hoppe and Banker, 2006, p. 14).

Two other specializations are common among retirement, residential/lifestyle, and low-sales farms. Roughly 20 to 37 percent of the three groups specialize in "other field crops," which includes farms with all their crop acres in land-retirement programs. Another 20 to 29 percent of each group specializes in "other livestock," which includes grazing livestock other than cattle (namely, horses, sheep, and goats.)

Some specializations are more common among family farms with gross sales greater than $100,000 (medium-sales and large-scale farms). Farms specializing in cash grains account for about 36 to 48 percent of these farms, while 10 to 16 percent specialize in dairy (versus 3 percent of farms in general). Large and very large family farms are also more likely than other types to specialize in poultry. Relatively few farms produce hogs, but the specialization is most common (7 percent) among very large farms.

Specialization in high-value crops is common among very large family farms and nonfamily farms, which together account for 83 percent of the total production of these crops. No more than 10 percent of any small-farm type specializes in these crops. High-value crops can generate large sales per acre, but they can require much more labor than cattle and they may require more marketing expertise.

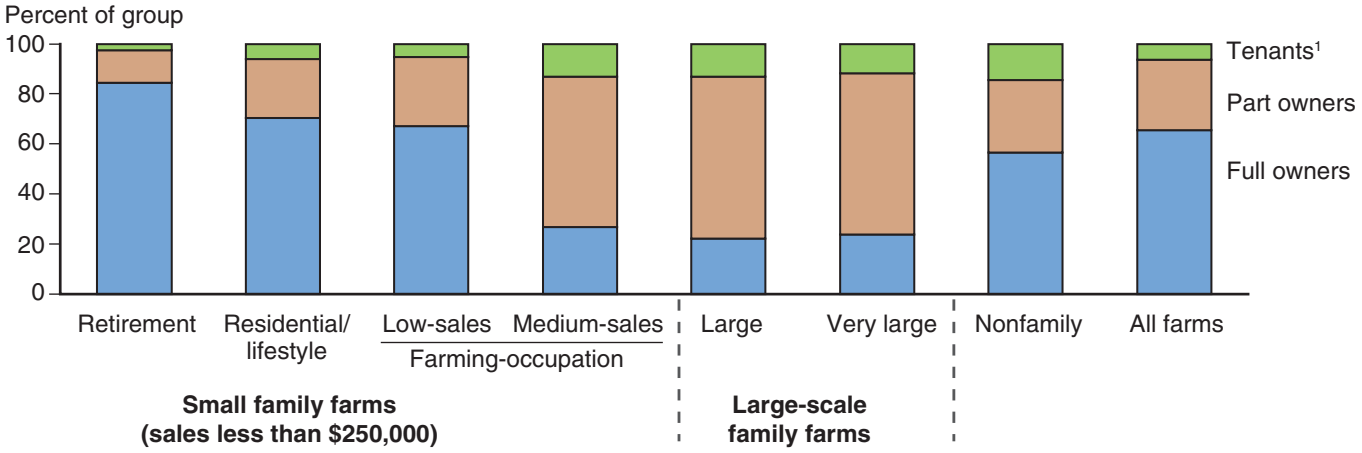
Tenure and Land Leasing

The majority of retirement, residential/lifestyle, low-sales, and nonfamily farms are full owners, owning all the land they operate (fig. 6). Leasing is most common among family farms with sales of at least $100,000. About two-thirds of the farms in each of these groups are part owners, meaning that they own part of the land they operate and rent the rest.

An additional 12 or 13 percent of family farms in these groups are tenants who own none of the land they operate but instead rent it all. Half of these farms specialize in cash grains, and they operate a median of 650 acres, with the median increasing with sales. Twenty-one percent of the large tenants rent machinery as well as land, and 63 percent report using custom work, such as fertilizer application or grain harvesting where machinery and machine operators are hired together.

Approximately 277,500 farm operators reported renting out 62 million acres of farmland to others in 2007, which accounted for only a fraction of the 395 million acres rented for farming. Nonoperator landlords provided the rest of the rented land. Information about landlords is sparse. The Agricultural Economics and Land Ownership Survey (AELOS) of 1999 is dated but still

Figure 6
Farms by tenure and farm type, 2007
Part ownership is most common among medium-sales and large-scale farms



[1]Farms that rent all the land they operate. (Also includes farms owning less than 1 percent of the land they operate.)
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

provides the most current, nationwide information about nonoperator landlords. Ninety-five percent of nonoperator landlords were individuals/families or partnerships in AELOS (USDA, NASS, 2001, p. 247). Of these unincorporated landlords, 55 percent were at least 65 years old.

Location of U.S. Farms and Production

The number and characteristics of U.S. farms vary substantially by resource region (see box, "Geographic Units"). The Heartland has the most farms—436,600, or 20 percent of the U.S. total—followed by the Eastern Uplands, with 16 percent of all farms (table 4). Farms are larger in the Heartland than in the Uplands, however. About 24 percent of farms in the Heartland are family farms with sales of at least $100,000, compared with only 6 percent of the farms in the Uplands.

Twenty-six percent of farms in the Northern Great Plains have sales of at least $100,000, about the same share as in the Heartland. The Northern Plains, however, accounts for only 6 percent of the value of U.S. production. Agricultural production is concentrated in the Heartland and Fruitful Rim, which together account for 46 percent of U.S. production. The Heartland and Fruitful Rim also account for the largest shares of the Nation's million-dollar farms, 25 and 21 percent, respectively.

Production by Region

Different regions concentrate on specific commodities. The Heartland alone accounts for more than half the cash grains and two-thirds of the hogs produced in the United States. The Fruitful Rim is responsible for nearly two-thirds of the Nation's production of high-value crops. Two regions—the Prairie Gateway and Mississippi Portal—produce three-fifths of the cotton. The Eastern Uplands and Southern Seaboard together account for four-fifths of tobacco and two-thirds of poultry production, while the Northern Crescent and Fruitful Rim each account for about one-third of dairy production.

Some regional specializations are longstanding and were established by the late 1800s, reflecting local comparative advantages in the production of specific commodities (Cochran, 1993, pp. 91-92). Examples include grain production—particularly corn—in the Heartland and dairy production in the Northern Crescent. Other specializations are of more recent origin. For example, the 16-percent share of hog production in the Southern Seaboard reflects the expansion of hog enterprises in North Carolina in the 1980s and 1990s, facilitated by the use of contracts (McBride and Key, 2003, p. 19).

Metropolitan Farming

Farming is popularly viewed as taking place in rural areas (Gale and Harrington, 1993, p. 5). Nevertheless, 39 percent of U.S. farms are located in metropolitan (metro) areas (table 5), defined as a county or group of counties with an urban population concentration of at least 50,000 people (see box, "Geographic Units").[4] Metro areas provide both opportunities and problems for farms (Heimlich and Anderson, 2001, pp. 38-44). For example, farmers may have opportunities to produce and sell high-value crops through farmers' markets. Proximity to employment in the metropolitan core might provide members of farm families with opportunities to work off-farm. On the other hand, markets for traditional field crops could be reduced as more land is developed. Grain elevators, for example, might go out of business. Real estate taxes may increase as land prices rise to reflect the value of the land in nonfarm uses.

[4]According to the official U.S. Census Bureau definition, rural areas include the open countryside plus settlements with fewer than 2,500 inhabitants. Urban areas have larger populations and include the densely settled areas around them. Nevertheless, researchers who follow conditions in rural areas and compare them with conditions in urban areas often use nonmetro counties to represent rural areas and metro counties to represent urban areas because annual data are available for counties. This report also follows the convention of using metro and nonmetro designations, since the rural and urban designations are not available in the Agricultural Resource Management Survey. (For more information, see "Measuring Rurality: What is Rural?" on the ERS website at www.ers.usda.gov/briefing/rurality/whatisrural/.)

Geographic Units

Resource regions. The Economic Research Service (ERS) developed farm resource regions based on the characteristics of the land and the commodities produced (USDA, ERS, 2000). The regions were developed from four sources:

1. A cluster analysis of farm characteristics,
2. USDA farm production regions,
3. USDA land resource regions, and
4. USDA, National Agricultural Statistics Service crop reporting districts.

Resource regions cross State boundaries but are more homogeneous with respect to natural resources and farm production than regions based on combinations of States (see map).

Metropolitan and nonmetropolitan residence. The Office of Management and Budget (OMB) is responsible for designating metropolitan (metro) and nonmetropolitan (nonmetro) areas. Metro areas are central counties with one or more urbanized areas—containing an urban nucleus of at least 50,000 people—plus any outlying counties that are economically connected to the central counties by commuting. Nonmetro counties are a residual, the counties lying outside metro areas. Based on OMB's 2003 metro/nometro designations, the United States currently has 1,090 metro counties and 2,052 nonmetro counties.

Nonmetro counties are sorted further into two groups: micropolitan and noncore. OMB identifies 674 micropolitan counties, using a process silimiar to that used to identify metro counties, except the population criterion is lower for micropolitian counties. Any nonmetro county with an urban cluster of at least 10,000 people is the central county of a micropolitan area. Outlying counties are included in the micropolitan area if they are economically connected to the central county by commuting. The 1,378 remaining nonmetro counties are designated as noncore counties.

For more information, see "Measuring Rurality: What is Rural?" at www.ers.usda.gov/briefing/rurality/whatisrural/ and "Measuring Rurality: What is a Micropolitan Area?" at www.ers.usda.gov/briefing/rurality/micropolitanareas/ on the ERS website.

Farm Resource Regions

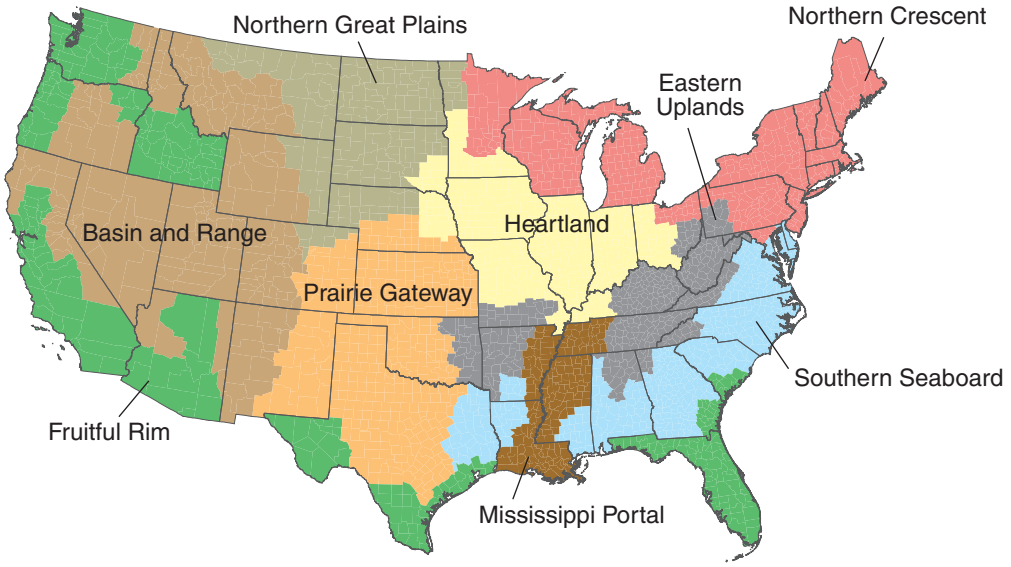


Table 4

Farms and production by resource region, 2007

Item	Resource region[1]									
	Heartland	Northern Crescent	Northern Great Plains	Prairie Gateway	Eastern Uplands	Southern Seaboard	Fruitful Rim	Basin & Range	Mississippi Portal	All farms
	Thousands									
Total farms	436.6	318.6	99.4	315.5	345.6	242.5	261.9	89.9	86.8	2,196.8
	Percent of U.S. total									
Distribution of:										
All farms	19.9	14.5	4.5	14.4	15.7	11.0	11.9	4.1	4.0	100.0
Million-dollar farms	24.7	10.5	5.4	13.4	5.7	12.5	21.0	2.3	4.5	100.0
	Percent of group									
Type of farm:										
Retirement	18.1	17.9	20.9	14.0	20.4	17.1	21.6	18.2	20.7	18.4
Residential/lifestyle	39.5	44.2	26.9	49.0	53.4	51.2	40.4	41.7	49.9	45.1
Lower-sales	16.1	21.7	24.0	20.2	19.8	17.4	22.8	25.9	16.6	19.8
Medium-sales	8.1	7.1	9.6	4.6	1.9	2.6	3.5	6.1	1.9	5.1
Large	7.8	4.4	8.6	3.7	1.5	2.8	2.8	3.5	2.9	4.3
Very large	7.9	3.6	7.4	4.6	2.2	5.7	5.0	2.4	6.3	5.0
Nonfamily	2.5	1.1	2.5	3.8	0.9	3.3	3.8	2.1	1.7	2.4
	Percent of U.S. total									
Value of production	25.9	10.7	6.0	16.3	5.8	9.3	20.4	2.5	2.9	100.0
Cash grains[2]	53.6	7.2	10.8	15.4	0.4	2.6	2.8	1.6	5.7	100.0
Cotton	3.6	0.0	0.0	39.4	d	15.6	18.3	d	21.7	100.0
High-value crops[3]	3.0	13.1	0.8	3.8	5.0	6.8	62.8	3.9	0.9	100.0
Tobacco	9.7	4.3	0.0	0.0	20.4	63.5	d	0.0	d	100.0
Beef	22.2	3.5	8.9	41.1	7.7	3.2	8.8	3.7	0.8	100.0
Hogs	70.2	5.0	0.4	6.1	1.5	15.7	0.1	0.1	0.9	100.0
Dairy	8.9	32.7	3.2	10.0	4.1	2.8	36.5	d	d	100.0
Poultry	13.2	7.8	0.1	d	22.9	44.2	4.2	d	4.1	100.0

d = Data suppressed due to insufficient observations.
[1]For the areas included in each resource region, see box, "Geographic Units," on page 16.
[2]Includes barley, corn, oats, rice, sorghum, soybeans, wheat, and oats.
[3]Vegetables, fruits and tree nuts, and nursery and greenhouse products.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Table 5
Farms and population by resource region and residence, 2007

Resource region[1]	Farms	Distribution of farms, by residence[1]: Metro-politan	Nonmetropolitan: Total	Nonmetropolitan: Micro-politan	Nonmetropolitan: Noncore	Population[2]: 2007 estimate	Population[2]: Density	Metropolitan counties[1]
	Number	*Percent of farms in region*				*Million persons*	*Persons per sq. mile*	*Pct. of region's counties*
U.S. total	2,196,791	39.1	60.9	24.6	36.3	299.7	101	34.9
Heartland	436,572	31.5	68.5	27.7	40.8	37.0	130	32.9
Northern Crescent	318,638	46.0	54.0	27.6	26.4	79.2	249	47.6
Northern Great Plains	99,423	15.9	84.1	18.7	65.4	3.2	11	7.8
Prairie Gateway	315,541	31.0	69.0	22.7	46.2	21.7	53	20.8
Eastern Uplands	345,565	34.1	65.9	24.2	41.8	22.2	110	36.6
Southern Seaboard	242,471	46.9	53.1	21.9	31.1	36.7	148	45.0
Fruitful Rim	261,920	66.5	33.5	16.8	16.7	80.0	167	50.4
Basin and Range	89,862	35.8	64.2	32.0	32.3	11.5	18	19.3
Mississippi Portal	86,800	27.1	72.9	37.3	35.6	8.1	82	29.7

[1]Resource region and residence are defined in box, "Geographic Units," on page 16.
[2]Alaska and Hawaii are excluded to be consistent with the Agricultural Resource Management Survey.
Sources: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III. U.S. Department of Commerce, U.S. Census Bureau for 2007 population estimates. U.S. Department of Commerce, U.S. Census Bureau, 2000 Population Census for land area.

Within each region, the share of farms in metro areas is generally of the same magnitude as for the United States as a whole, 39 percent plus or minus a few percentage points. Two regions, however, stand out: the Fruitful Rim and the Northern Great Plains.

The Extremes: Fruitful Rim and Northern Great Plains

Sixty-seven percent of farms in the Fruitful Rim are located in metro areas, 28 percentage points more than the rate for all U.S. farms (see table 5). California alone accounts for 37 percent of metro farms in the region, a larger share than any other State. Metro counties in California often are extensive and have room for both farming and a large urban population. For example, Fresno County is classified as metro, has a 2007 population estimate at 899,300, and has a land area of about 6,000 square miles (slightly larger than Connecticut). Farm sales total $3.7 billion in the county, compared with $3.2 billion in the six New England States, according to the 2007 Census of Agriculture.

In contrast to the Fruitful Rim, only 16 percent of farms in the Northern Great Plains are located in metro areas. This is less than half the 39-percent share for all U.S. farms, which reflects the region's small population. Total population of the region is only 3 million—or 11 people per square mile—and only 8 percent of the region's counties are classified as metro. The large

majority of farms in the region, 65 percent, are in noncore nonmetro areas, with no urban concentration of 10,000 people or more. Fewer off-farm job opportunities in such sparsely settled areas, combined with economies of scale in farming, may contribute to the region's high share of farms with sales of at least $100,000.

Metropolitan Production

Farms in metro areas account for 40 percent of the value of U.S. agricultural production (table 6) and have a product mix different than farms in nonmetro areas. High-value crops and dairy products make up a larger share of production in metro areas than in nonmetro areas, while cash grains and beef make up a smaller share. The mix of production in metro areas, however, reflects the production mix in the Fruitful Rim, which accounts for 43 percent of all metro production.

In the metro Fruitful Rim, high-value crops make up the largest share of the value of production (52 percent), followed by livestock (35 percent), particularly dairy production (24 percent). In metro areas in other regions, the largest sources of production are a diverse livestock sector (50 percent), cash grains and soybeans (27 percent), and high-value crops (16 percent).

Table 6
Composition of the value of production by residence and region, 2007

Item	Metropolitan			Nonmetro-politan	All farms
	Total	Fruitful Rim	Other regions		
			Number		
Total U.S. farms	859,274	174,261	685,013	1,337,517	2,196,791
			Billion dollars		
Value of production	115.7	49.5	66.3	176.2	292.0
			Percent of U.S. total		
Distribution of:					
Farms	39.1	7.9	31.2	60.9	100.0
Value of production	39.6	16.9	22.7	60.4	100.0
			Percent		
Composition of value of production:					
Cash grain and soybeans[1]	16.6	2.1	27.4	31.1	25.3
Other field crops	8.2	10.3	6.7	7.1	7.5
High-value crops[2]	31.7	52.4	16.3	6.1	16.2
Livestock	43.4	35.2	49.6	55.8	50.9
Beef	10.6	7.2	13.1	26.6	20.3
Hogs	3.3	0.0	5.7	7.6	5.9
Dairy	18.3	24.3	13.7	9.0	12.7
Poultry	9.4	1.7	15.2	11.3	10.6
Other livestock	1.9	2.1	1.8	1.2	1.5

Note: Resource regions, metropolitan, and nonmetropolitan are defined in box, "Geographic Units," on page 16.

[1]Includes barley, corn, oats, rice, sorghum, soybeans, wheat, and oats.
[2]Vegetables, fruits and tree nuts, and nursery and greenhouse products.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

California farms heavily influence the composition of production in metro areas of the Fruitful Rim, since California alone accounts for 65 percent of all production in the metro parts of the region. The valleys of California were irrigated by the late 1800s and have specialized in high-value crops ever since (Cochrane, 1993, pp. 88-93). Irrigation—in combination with the State's climate—enables farmers to harvest some crops more than once per year.

The composition of production in metro areas in regions other than the Fruitful Rim shares some characteristics with the composition in nonmetro areas. In nonmetro areas and in non-Rim metro areas, livestock makes up about one-half of production, and cash grains make up roughly 30 percent. The composition of the livestock sector varies between the two areas, however, with beef and hogs forming a larger share in nonmetro areas, and dairy and poultry forming a larger share in metro areas outside the Rim. In addition, the share of production from high-value crops is more than twice as high in non-Rim metro counties as in nonmetro counties.

Farm Operators, Principal and Secondary

Every farm has at least one operator, the farmer who makes everyday decisions about the farm business. However, some farms—particularly the larger ones—have more than one operator who makes decisions. In such cases, one operator is designated as the principal operator, the one most responsible for running the farm. The others are secondary operators.

Commercial-sized farms often require more management and labor than an individual can provide. Additional operators can provide the necessary labor and management and possibly other resources, such as capital or farmland. Having a secondary operator may also provide a successor when an older principal operator phases out of farming.

Secondary Operators and Their Farms

There are secondary operators on 880,500 multiple-operator farms (table 7). Because farms are generally family businesses, one would expect

Table 7
Multiple-operator farms by farm type, 2007

	Small family farms				Large-scale farms			
			Farming-occupation					
Item	Retirement	Residential/ lifestyle	Low-sales	Medium-sales	Large	Very large	Nonfamily farms	All farms
				Number				
Total operators	549,919	1,449,899	597,035	163,098	149,068	193,827	96,717	3,199,563
Principal operators[1]	403,828	989,830	434,599	111,389	93,601	110,152	53,393	2,196,791
Secondary operators	146,091	460,070	162,437	51,709	55,467	83,675	43,325	1,002,772
Spouses	102,458	356,660	123,998	35,091	31,413	33,581	5,245	688,447
Other	43,633	103,410	38,439	16,617	24,054	50,093	38,080	314,326
				Percent of farms				
Farms with:								
Spouse as an operator	25.4	36.0	28.5	31.5	33.6	30.5	9.8	31.3
Other secondary operator(s)	8.1	8.6	7.5	11.5	18.7	30.5	45.1	10.9
Both	1.7	1.7	1.6	3.2	4.1	6.5	3.5	2.1
				Percent of secondary operators				
Spouse share of secondary operators	70.1	77.5	76.3	67.9	56.6	40.1	12.1	68.7
				Number				
Operators (principal and secondary) per farm	1.4	1.5	1.4	1.5	1.6	1.8	1.8	1.5
Multiple-operator farms[2]	128,112	425,748	149,766	44,309	45,037	60,067	27,422	880,460
				Percent				
Multiple-operator farms as share of all farms	31.7	43.0	34.5	39.8	48.1	54.5	51.4	40.1

Note: The Agricultural Resource Management Survey counts all operators—principal and secondary—and asks for detailed information on up to three operators.

[1]The number of principal operators equals the number of farms. Each farm has one principal operator.
[2]Mulitiple-operator farms report more than one operator.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

family members to serve as secondary operators. In fact, 69 percent of the secondary operators—688,400 out of 1 million—are spouses. (The number of secondary operators is 14 percent greater than the number of multiple-operator farms because some multiple-operator farms have more than one secondary operator.)

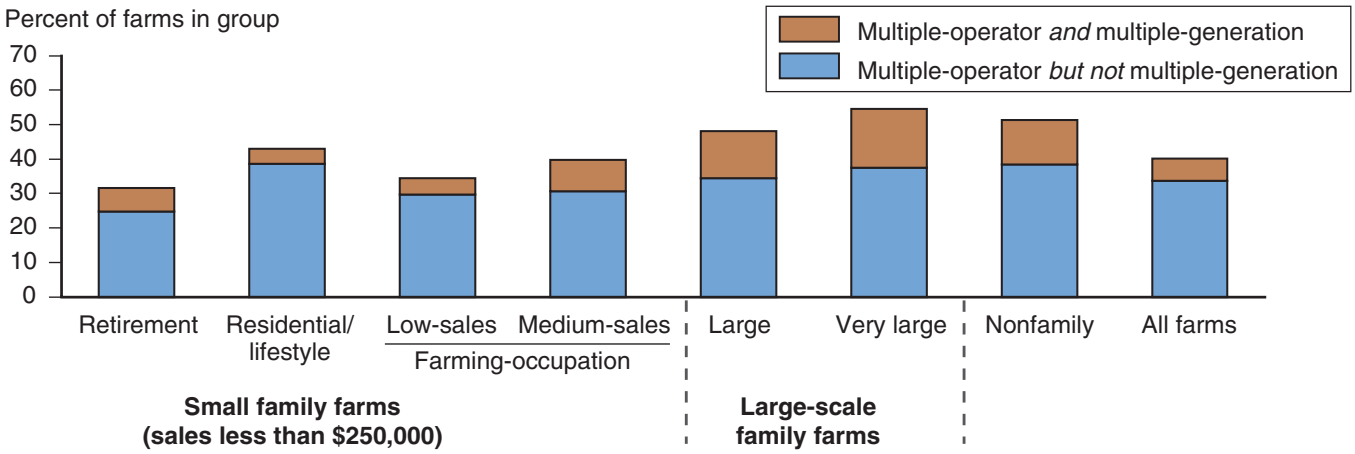
As one would expect, the number of operators per farm is higher for large-scale farms. The number of operators per farm reaches 1.8 operators, on average, for very large family farms and nonfamily farms. The share of family farms with two or more operators peaks at 55 percent on very large farms, 15 percentage points higher than the share for all U.S. farms. About 43 percent of residential/lifestyle farms have multiple operators—more than the corresponding share for other small-farm types—reflecting the higher share of residential/lifestyle farms where spouses are operators.

About 16 percent of all multiple-operator farms (and 6 percent of all farms) are multiple-generation farms, with at least 20 years' difference between the ages of the oldest and youngest operators. Multiple-generation farms are most common among large-scale and nonfamily farms (fig. 7), which have enough business to keep more than one generation employed.

Aging Principal Operators

Perhaps the most striking characteristic of principal farm operators is their advanced age. About 28 percent of farm operators are at least 65 years old (table 8). In contrast, only 8 percent of self-employed workers in nonagricultural industries are that old (USDOL, BLS, 2008, p. 224). Retired operators

Figure 7
Multiple-operator and multiple-generation farms by farm type, 2007
Multiple-generation farms are most common among large-scale and nonfamily farms



Notes: Multiple-operator farms have more than one operator. Multiple-generation farms are multiple-operator farms with a difference of at least 20 years between the ages of the youngest and oldest operators. The remaining farms are single-operator farms with only one operator (not shown).

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Table 8
Age of principal operators by farm type, 2007

Item	Small family farms				Large-scale farms		Nonfamily farms	All farms
	Retirement	Residential/ lifestyle	Farming-occupation					
			Low-sales	Medium-sales	Large	Very large		
	Number							
Total principal operators	403,828	989,830	434,599	111,389	93,601	110,152	53,393	2,196,791
	Years							
Mean age	70	52	59	54	53	53	54	57
	Percent of group							
Age:								
Younger than 35 years	d	7.2	3.0	7.3	6.5	6.1	5.1	5.1
35 to 44 years	d	17.6	7.0	13.3	14.6	16.5	17.3	12.3
45 to 54 years	4.8	34.5	15.2	27.6	32.7	33.0	20.6	24.4
55 to 64 years	19.0	30.4	41.5	30.3	29.5	30.9	37.7	30.7
65 years or older	73.2	10.2	33.2	21.4	16.7	13.5	19.3	27.6

d = Data suppressed due to insufficient observations.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

are the oldest group—as one might expect—with an average age of 70 years, followed by low-sales operators, with an average age of 59 years.

The advanced age of farm operators is understandable, given that the farm is the home for most farmers and that farmers can phase out of farming gradually over a decade or more (Ahearn et al., 1993, p. 7). Improved health and advances in farm equipment have also allowed farmers to farm later in life than in previous generations (Mishra et al., 2005, p. 14).

Older Operators and the Future

The Nation's 28-percent share of operators at least 65 years old—called "older farmers" in this report—has raised concerns about a mass exit of farmers from agriculture in the near future (Gale, 2002, p. 30) and the likelihood of finding younger farmers to replace them and absorb their assets, including land. The eventual exit of older farmers appears less ominous, however, if one examines their characteristics, especially the type of farms they operate. Remember also that some farms with an older principal operator actually are multiple-generation businesses with younger operators present.

Figure 8 shows the percentage of U.S. farms, farm assets, and value of production accounted for by older principal operators. The shares are further divided by type of farm and whether or not the farm is a multiple-generation operation. For ease of exposition, the seven farm types have been combined into three.

Small Family Farms

Older farmers' 28-percent share of all farms includes the 18 percent of farmers classified as older who operate retirement or residential/lifestyle

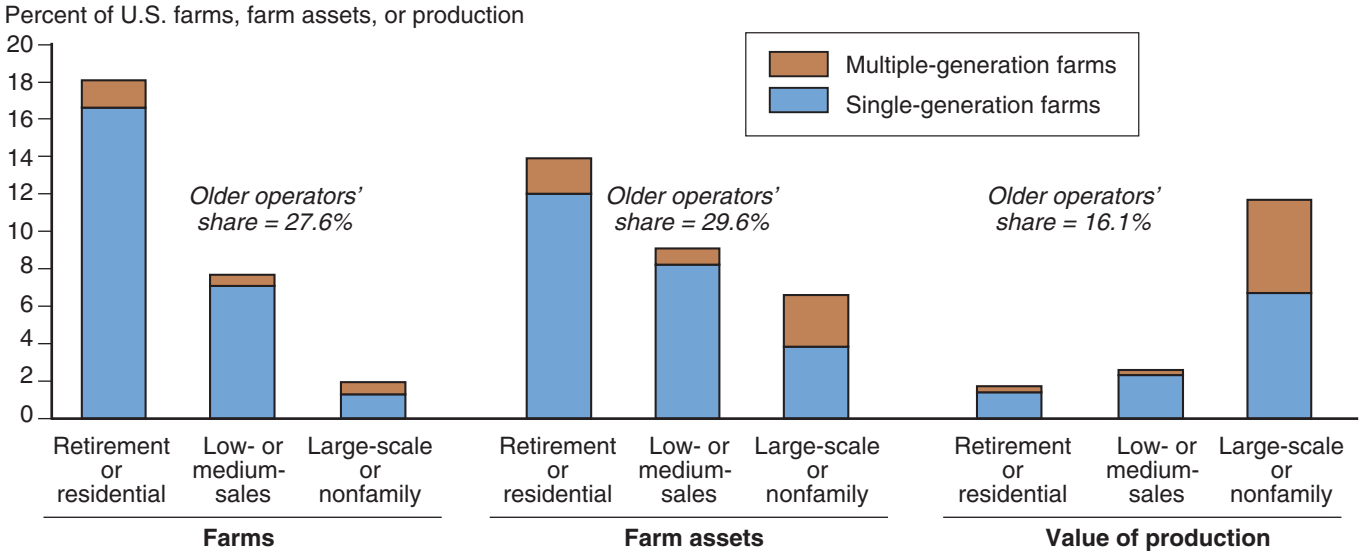
farms. Since these farmers produce only 2 percent of U.S. output, their impact on U.S. agriculture as they leave farming entirely should be minimal. Their 14-percent share of assets does not contribute substantially to their own production, although they may rent land to other operators. About 22 percent of the land they own is rented out, and another 13 percent is enrolled in land-retirement programs.

Low- and medium-sales farms with an older operator account for another 8 percent of all U.S. farms, 9 percent of assets, but only 3 percent of production. Only a small portion of these farms are multiple generation, with a younger operator present to take the place of the exiting older operator. Multiple-generation farms in this group account for roughly 1 percent of the Nation's farms and assets, so the assets to be absorbed as these operators exit amount to 8 percent of total U.S. farm assets.

Large-Scale and Nonfamily Farms

Most of the production by older farmers occurs on large-scale farms and nonfamily farms. Older operators on these farms account for 12 percent of U.S. production but only 2 percent of farms and 6 percent of assets. However, some of these farms are multiple-generation operations. The large-scale and nonfamily farms with no apparent replacement secondary operator—at least in the ARMS data—account for 4 percent of all farm assets, which would have to be absorbed by other operations as the current operators exit. These single-generation farms also account for about 7 percent of U.S production, nearly double their share of assets.

Figure 8
Older principal operators' share of farms, farm assets, and production, 2007
Most older farmers operate retirement or residential/lifestyle farms



Note: Older operators are at least 65 years old.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Total Assets To Absorb

The amount of productive assets available to be absorbed by the sector to maintain production as older operators exit is not the 30 percent of all U.S. farm assets held by all older farmers. The share to be absorbed is the 12 percent used by older operators on commercially oriented farms—low- and medium-sales farms, plus large-scale and nonfamily farms—that are not multiple-generation operations. The 12-percent estimate overstates the share of assets to be absorbed, however, since 37 percent of nonfamily farms have sales less than $10,000 (see table 2) and are not commercially oriented.

Some of these assets can be purchased or rented by farms with younger operators currently in business. Other assets could be absorbed by new farms entering the business. Analysis of longitudinal data compiled from Census of Agriculture data shows that a substantial number of farms exit the sector, or go out of business, between censuses. Entrances of new farms, however, are also fairly high, largely offsetting exits. Like other industries, farming has substantial turnover (Hoppe and Korb, 2006, pp. 7-10).

Farm Income and Financial Performance

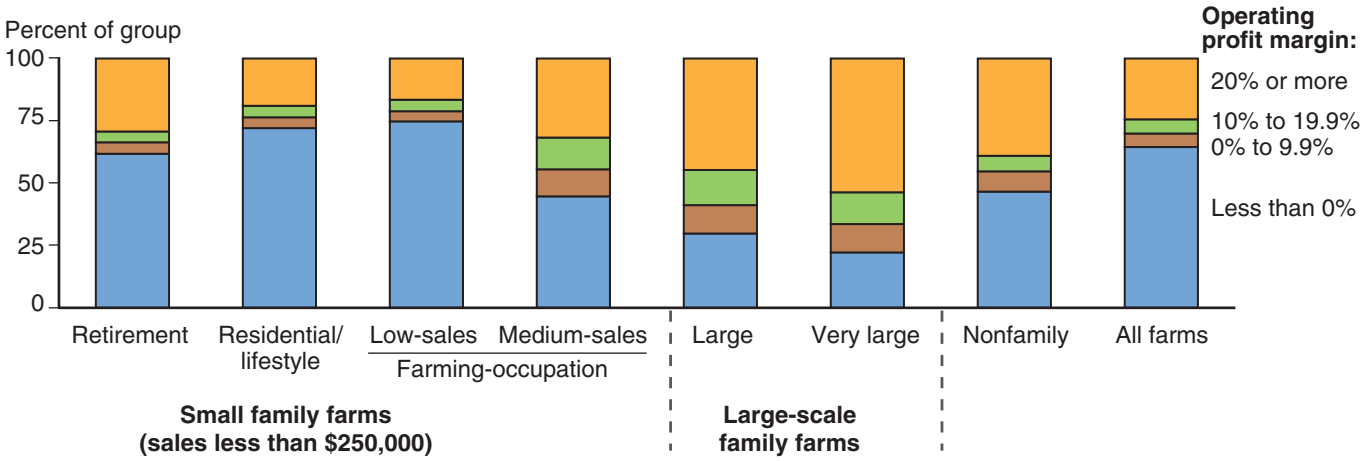
Profitability measures are strongly associated with farm size. The average rates of return on assets and equity and the average operating profit margin are negative for retirement, residential/lifestyle, and low-sales small farms (table 9). These measures turn positive for medium-sales small farms, and increase further for large-scale and nonfamily farms. The ratios are higher for very large farms than for large farms, reflecting very large farms' higher level of sales. Larger farms often can use their resources more productively than smaller farms, generating more dollars of sales per unit of labor and capital. (See box, "Defining the Financial Measures," for information on how the ratios are calculated.)

Average profit measures, however, obscure the wide variation in financial performance among farms, including small farms. Although 45 to 75 percent of the farms in each small-farm type had a negative operating profit margin in 2007, other small farms among these types were much more profitable (fig. 9). For example, between 17 percent and 32 percent of each small-farm type had an operating profit margin of at least 20 percent. Nevertheless, an even greater share of large-scale family farms had profit margins that high—45 percent for large family farms and 54 percent for very large family farms. In addition, most of the farms in both of these groups had a positive operating profit margin.

Net Farm Income

Small farms appear more profitable if net farm income is examined rather than operating profit margins. Although most small farms had a negative operating profit margin, a majority of each small-farm type generated positive net farm income (see table 9). The different results are attributed mostly to differences in the way the two measures treat unpaid labor by the operator

Figure 9
Farms by operating profit margin and farm type, 2007
Small family farms are more likely to have a negative operating profit margin than large-scale family farms



Note: Operating profit margin = 100% X (net farm income + interest paid – charges for operator and unpaid labor – charge for management) / gross farm income.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

and other persons. Operating profit—the numerator of the operating profit margin—is calculated with a deduction for unpaid labor to reflect the opportunity cost of labor provided without payment. Net farm income, in contrast, makes no such deduction (Hoppe et al., 2010).

Average net farm income varies with sales class and is low for small farms, compared with that for large and very large family farms. The variation in net income reflects the wide variation in gross farm income, which ranges from roughly $25,000 for the average retirement and residential/lifestyle farm to $1.3 million for very large family farms, on average.

Table 9

Selected financial performance measures by farm type, 2007

	Small family farms				Large-scale farms			
			Farming-occupation					
Item	Retirement	Residential/ lifestyle	Low-sales	Medium-sales	Large	Very large	Nonfamily farms	All farms
				Number				
Total farms	403,828	989,830	434,599	111,389	93,601	110,152	53,393	2,196,791
				Percent				
Profitability measures:								
Rate of return on assets	-1.0	-2.3	-2.8	0.9	3.5	9.9	9.3	1.8
Rate of return on equity	-1.2	-2.9	-3.4	0.3	3.0	10.2	9.4	1.2
Operating profit margin	-23.1	-47.4	-48.6	5.9	16.3	25.7	24.4	11.0
				Dollars per farm				
Income measures:								
Gross farm income	25,073	23,217	43,090	204,305	398,975	1,301,408	864,548	137,222
Net farm income	7,687	2,206	5,049	54,693	109,725	372,297	230,562	35,126
				Percent				
Farms with positive net farm income	68.7	54.9	60.6	81.0	82.9	83.8	73.0	63.0
Financial efficiency measure:								
Operating expense ratio	91.7	126.4	105.2	77.1	73.9	70.6	72.0	77.2
				Thousand dollars per farm				
Balance sheet:								
Total assets	591	488	740	1,310	1,846	3,380	2,281	845
Total liabilities	10	29	35	99	197	528	231	67
Net worth	581	459	705	1,211	1,649	2,852	2,050	778
				Percent				
Solvency measure:								
Debt/asset ratio	1.8	5.9	4.7	7.6	10.6	15.6	10.1	8.0
Solvency and income measure:								
Financial position:								
Favorable	68.4	53.2	59.0	76.2	76.1	72.5	69.8	60.6
Marginal-income	30.6	40.1	37.5	17.2	14.8	12.2	25.1	33.8
Marginal-solvency	d	1.8	1.7	4.7	6.8	11.4	3.2	2.4
Vulnerable	d	5.0	1.9	1.9	2.3	3.9	1.9	3.2

Note: See box, "Defining the Financial Measures," for details on how the financial performance measures are calculated.
d = Data suppressed due to insufficient observations.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Defining the Financial Measures

Some of the financial measures used in table 9 are discussed below. The discussion focuses on the more involved financial ratios and show how they are calculated in the Agricultural Resource Management Survey (ARMS).

Rate of return on assets. The ratio of net farm income to the assets of the farm. This ratio is often viewed as an index of profitability, with higher values indicating greater profitability. It is calculated as:

Rate of return on assets = 100% × (net farm income + interest paid - charge for operator and unpaid labor - charge for management) ÷ total assets

Interest paid is added back into net farm income because it is the cost of borrowing capital and is part of the return to assets. In the case of unincorporated farms, a charge for operator and unpaid labor and a charge for management are deducted from net farm income to reflect their opportunity cost.

Rate of return on equity. The ratio of net farm income to the net worth of the farm. As with the rate of return on assets, it is viewed as an index of profitability, with higher values indicating greater profitability. It is calculated as:

Return on equity = 100% × (net farm income - charge for operator and unpaid labor - charge for management) ÷ net worth

Interest paid is not added back into net farm income in this case because the returns to the assets that are owned by the farm are of concern, not those financed through borrowing.

Operating profit margin. A measure of profitability: returns per dollar of gross farm income (or gross revenue). The operating profit margin measures the funds available to finance the farm business's capital, after accounting for the unpaid labor and management contributed by farm operators and their families. It is calculated as:

Operating profit margin = 100% × (net farm income + interest paid - charges for operator and unpaid labor - charge for management) ÷ gross farm income

Operating expense ratio. The ratio of cash operating expenses to gross cash farm income. If the ratio is greater than 100 percent, cash income does not cover cash expenses. It is calculated as:

Operating expense ratio = 100% × total cash operating expenses ÷ gross cash farm income

Debt/Asset ratio. Ratio of the farm's total debt to total assets, showing the share of assets owed to creditors. It is a measure of the risk exposure of the farm business, with a higher ratio corresponding to greater risk.

Debt/asset ratio = 100% × total debt ÷ total assets

Financial position. Measure of the overall financial position of farms based on their combined net income and solvency status:

- **Favorable:** positive net farm income and debt/asset ratio no more than 40 percent.
- **Marginal-income:** negative net farm income and debt/asset ratio no more than 40 percent
- **Marginal-solvency:** positive net farm income and debt/asset ratio greater than 40 percent.
- **Vulnerable:** negative net farm income and debt/asset ratio greater than 40 percent.

For more information about farm financial measures, see *Financial Guidelines for Agricultural Producers* (Farm Financial Standards Council, 2008).

Overall, net farm income averaged $35,100 in 2007, or 46 percent higher than in 2006. Sixty-three percent of all farms earned positive net farm income in 2007, and these profitable farms accounted for the bulk of agricultural activity. They generated 81 percent of the total value of production and operated 70 percent of the land in farms.

Selected Financial Ratios

Residential/lifestyle farms had an operating expense ratio of 126 percent—on average—in 2007, which means that cash operating expenses exceeded gross cash farm income by 26 percent. Cash expenses also exceeded gross cash income for low-sales farms, but the ratio was lower, at 105 percent, near the 100-percent breakeven point. Retirement farms covered their expenses, with a ratio of 92 percent. The remaining farm types also generated enough income to cover expenses, on average, with their operating expense ratios falling in a fairly narrow range, from 71 to 77 percent.

The low debt/asset ratio for retirement farms—2 percent—reflects low debt levels rather than high asset levels. At the other extreme, the ratio for very large family farms is 16 percent, or double the rate for all U.S. farms. As a result of their high debt/asset ratio, very large farms are most likely to be considered marginally solvent (positive net farm income, but with a debt/asset ratio above 40 percent).

Most U.S. farms have a favorable financial position, which means they generate positive returns and have a debt/asset ratio no more than 40 percent. Sixty-one percent of U.S. farms and at least 53 percent of each farm type were classified as such in 2007. Vulnerable farms—with negative net income and a debt/asset ratio above 40 percent—are rare in all farm types, and amount to 3 percent of all farms. Residential/lifestyle farms make up 71 percent of the vulnerable group, but their operators are unlikely to depend on the farm for their livelihood.

Operator Household Income and Net Worth[5]

Given their negative operating profit margins and low net farm income, on average, how do so many small farms continue to exist? Households operating small farms typically receive substantial off-farm income. In 2007, average off-farm income for small-farm households ranged from just under $50,000 for low- and medium-sales households to $107,700 for households operating residential/lifestyle farms (table 10). Most off-farm income—76 percent for all U.S. farm households—is from earned sources, either a wage-and-salary job or self-employment. However, households operating retirement farms receive nearly three-fifths of their off-farm income from unearned sources (such as Social Security, pensions, dividends, interest, and rent), reflecting the advanced age of operators on those farms.

Participation in off-farm work varies by farm type. At one extreme, neither the operator nor spouse worked off-farm on 66 percent of retirement farms. At the other extreme, both the operator and spouse worked off-farm on 57 percent of residential/lifestyle farms. In the remaining farm types, someone—the operator and/or the spouse—worked off-farm in 43 to 59 percent of farm households.

Level of Operator Household Income

Average operator household income for all farm households was $88,900 in 2007, about 9 percent higher than in 2006. The 2007 estimate also was about 32 percent higher than the average for all U.S households in 2007, as measured by the Current Population Survey.

Mean income, however, may not be the best income measure to use for such comparisons because a few very high-income households can raise the mean well above the income received by most households. Median income for farm households as a group is similar to that for all U.S. households (fig. 10). Median farm-operator household income in 2007 was $54,000, only 8 percent higher than the $50,200 median for all U.S. households. Farm operator households in general cannot be considered low income. Only two types of farm households—those operating retirement or low-sales farms—received median household income below the U.S. median.

Operator Household Net Worth

The income that farm operator households receive from farming does not reflect the large net worth of many farm households. For example, for households on farms with gross sales of at least $100,000, average net worth in 2007 ranged from $1.3 million for medium-sales farms to $2.5 million for very large family farms (table 10).

Unlike household income, most of which comes from off-farm sources, net worth from the farm makes up most of the wealth of farm households, regardless of farm type. The farm—on average—accounts for 76 percent

[5]See "Appendix III: Measuring Operator Household Income and Net Worth," for more information on how operator household income and net worth are measured and defined.

Table 10

Income and wealth of principal operator households by farm type, 2007

Item	Small family farms				Large-scale farms		All farm households
	Retirement	Residential/ lifestyle	Farming-occupation: Low-sales	Farming-occupation: Medium-sales	Large	Very large	
				Number			
Total households	403,828	989,830	434,599	111,389	93,601	110,152	2,143,398
				Dollars per household			
Mean household income	55,228	101,677	44,488	76,191	109,639	268,227	88,912
Farm earnings[1]	-1,990	-5,984	-5,070	29,018	63,027	226,490	11,733
Off-farm income	57,219	107,661	49,559	47,173	46,613	41,736	77,179
Earned[2]	24,367	93,750	30,286	34,015	32,597	28,462	58,680
Unearned[2]	32,851	13,911	19,273	13,158	14,016	13,275	18,499
				Percent			
Share of income from off-farm[3]	103.6	105.9	111.4	61.9	42.5	15.6	86.8
Off-farm work—principal operator and spouse:[4]							
Only operator[5]	13.4	35.6	8.0	8.4	9.1	6.5	21.9
Only spouse	11.1	1.8	23.5	31.3	32.7	35.8	12.5
Neither[6]	66.3	5.4	56.8	47.6	41.3	47.5	33.0
Both	9.3	57.1	11.7	12.7	16.9	10.2	32.6
				Dollars per household			
Mean household net worth	755,221	681,151	856,901	1,295,837	1,689,448	2,529,375	901,700
Farm net worth	553,722	435,143	677,194	1,131,456	1,488,501	2,270,032	683,046
Nonfarm net worth	201,498	246,008	179,706	164,380	200,948	259,343	218,654
				Percent			
Share of net worth from the farm	73.3	63.9	79.0	87.3	88.1	89.7	75.8

Note: Household income and net worth are calculated only for family farms.

[1]Farm earnings in this table and net farm income in table 9 are not directly comparable. Net farm income includes cash and noncash items, is based on accrual accounting, and is calculated for the farm business. Farm earnings—in contrast—are based on cash items only, with the exception of a deduction for depreciation. Farm earnings also exclude the share of net income generated by the farm paid to other households, such as those of partners.

[2]Earned income comes from off-farm self-employment or wage or salary jobs. Unearned income includes interest and dividends, benefits from Social Security and other public programs, alimony, annuities, net income of estates or trusts, private pensions, regular contributions of persons not living in the household, net rental income from nonfarm properties, and royalties for mineral leases.

[3]Income from off-farm sources can be more than 100 percent of total household income if farm earnings are negative.

[4]Data on off-farm work by principal operators and their spouses were collected only in version 1 of the 2007 ARMS.

[5]Includes households where the operator works off-farm and there is no spouse.

[6]Includes households where the operator does not work off-farm and there is no spouse.

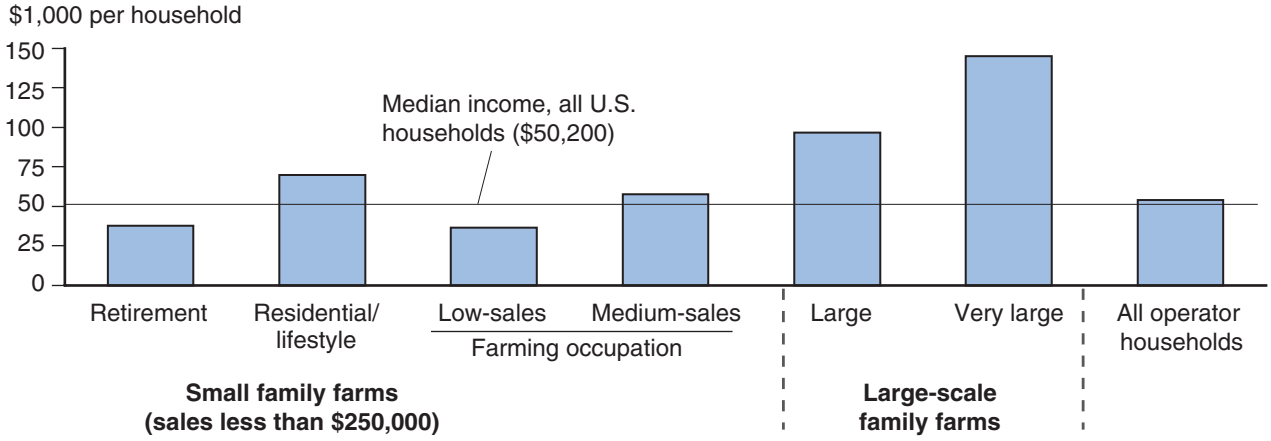
Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

of operator household net worth, reflecting the value of the land used in farming. However, much of the net worth of farm households is illiquid and not easily available to spend for consumption because it is largely based on assets necessary to continue farming. Real estate amounted to 79 percent of total assets of family farms.

Figure 10

Median income of principal-operator households by farm type, 2007

In aggregate, operator households income is similar to that of all U.S. households



Note: Median income falls at the midpoint of the distribution of households ranked by income. Half of the households have income above the median, while the other half have income below that level.

Sources: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III, for farm households. U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey for all U.S. households.

Government Payments

Farm program payments can conveniently be sorted into two groups—commodity-related and conservation (see box, "Types of Farm Program Payments"). About 39 percent of farms received Government payments of some sort in 2007, but the relative importance of Government programs varies widely by farm type (fig. 11). Medium-sales, large, and very large farms were more likely to receive Government payments, especially commodity-related payments, than smaller farms.

Commodity-Related Programs

Commodity programs target specific commodities, largely feed and food grains, cotton, and oilseeds. Payments are tied to the amount of cropland enrolled in programs and yield histories. Specialty crops (except dry peas, lentils, and chickpeas) and livestock (except dairy, wool, mohair, and honey) are not supported by traditional commodity programs. Producers of nonprogram commodities—as well as producers of program commodities—may also receive disaster assistance and occasional ad hoc payments. Farms producing nonprogram commodities may receive substantial payments if they also produce program commodities or did so in the past.

Types of Farm Program Payments

The 2007 Agricultural Resource Management Survey (ARMS) collected information about the following farm program payments:

Commodity-related payments. Direct payments, countercyclical payments, loan deficiency payments, marketing loan gains, net value of commodity certificates, milk income loss contact payments, agricultural disaster payments, and any other miscellaneous State, Federal, and local payments. Participation in these programs generally requires present or past production of specific commodities.
Goals: Establish price and farm income support, stabilize production, and provide a safety net for farmers.

Conservation payments. There are two types of conservation payments:

- **Payments from land-retirement programs.** Includes the Conservation Reserve Program (CRP), the Wetlands Reserve Program (WRP), the Farmable Wetlands Reserve Program (FWP), and the Conservation Reserve Enhancement Program (CREP).
  Goal: Remove environmentally sensitive farmland from production for long periods of time—at least 10 years, or permanently, in some cases.

- **Payments from working-land programs.** Includes the Environmental Quality Incentives Program (EQIP) and the Conservation Security Program (CSP). These programs provide technical and financial assistance to farmers who install or maintain conservation practices on land in production.
  Goal: Address environmental problems—such as pesticide and nutrient runoff—on land in production.

Since ARMS collects information from farm operators only, it excludes farm program payments made to people who do not farm, mainly landlords who are not farmers. In addition, the survey data show different levels and composition of Government payments than do administrative data, which are based on payment records. For more information, see "Appendix IV: Government Payments—Survey Versus Administrative Data."

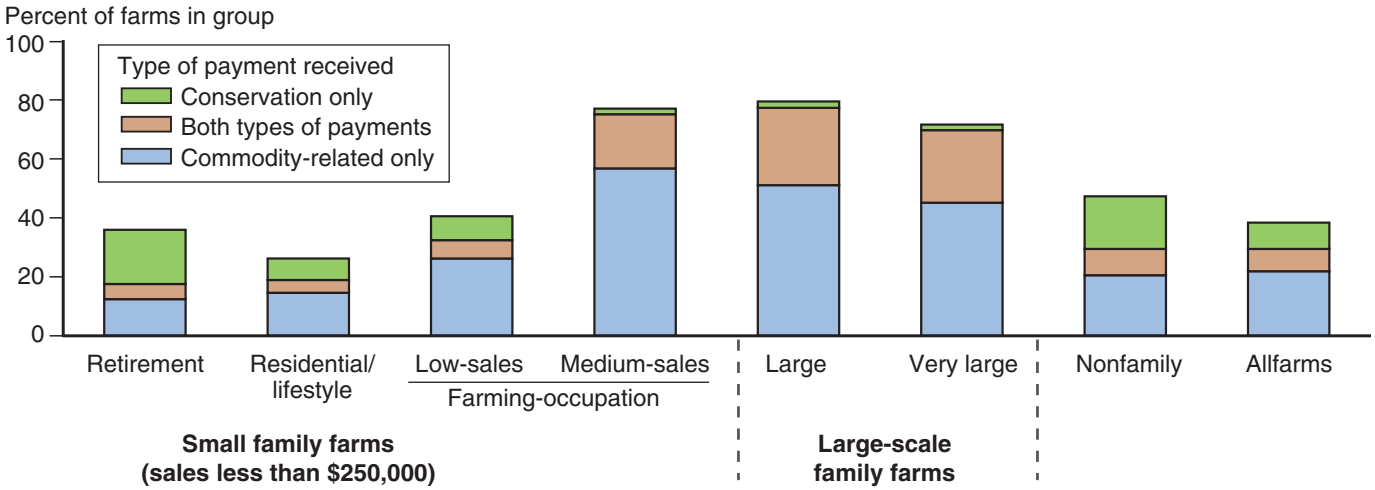
About three-fourths of medium-sales farms and large-scale farms receive commodity-related payments, summing the share receiving only commodity-related payments and the share receiving both commodity-related and conservation payments. These farms collectively received 76 percent of commodity program benefits paid to farmers in 2007 (fig. 12), roughly proportional to their production of program crops. Very large family farms alone received 45 percent of commodity-related payments.

Commodity-related payments in total are much larger than conservation payments, accounting for 75 percent of all Government payments made to farmers in 2007 (fig. 13). Commodity-related payments also make up a large majority of Government payments in each farm type, with the exceptions of retirement and residential/lifestyle farms. Commodity-related payments account for slightly less than half of total payments on residential/lifestyle farms and just over a quarter on retirement farms.

Conservation Programs

The four USDA land-retirement programs—CRP, CREP, WRP, and FWP—together make up 78 percent of all conservation payments paid to farms. The CRP is the largest land-retirement program by far, accounting for 74 percent of conservation payments by itself. Another 22 percent of conservation payments come from working-land programs: the Environmental Quality Incentives Program (EQIP) and the Conservation Security Program (CSP). EQIP and CSP have expanded in recent years (Claassen and Ribaudo, 2006, p. 171), but they still make up only 15 and 7 percent, respectively, of conservation payments in the 2007 ARMS.

Figure 11
Farms receiving Government payments by type of payment and farm type, 2007
Most medium-sales and large-scale farms receive Government payments



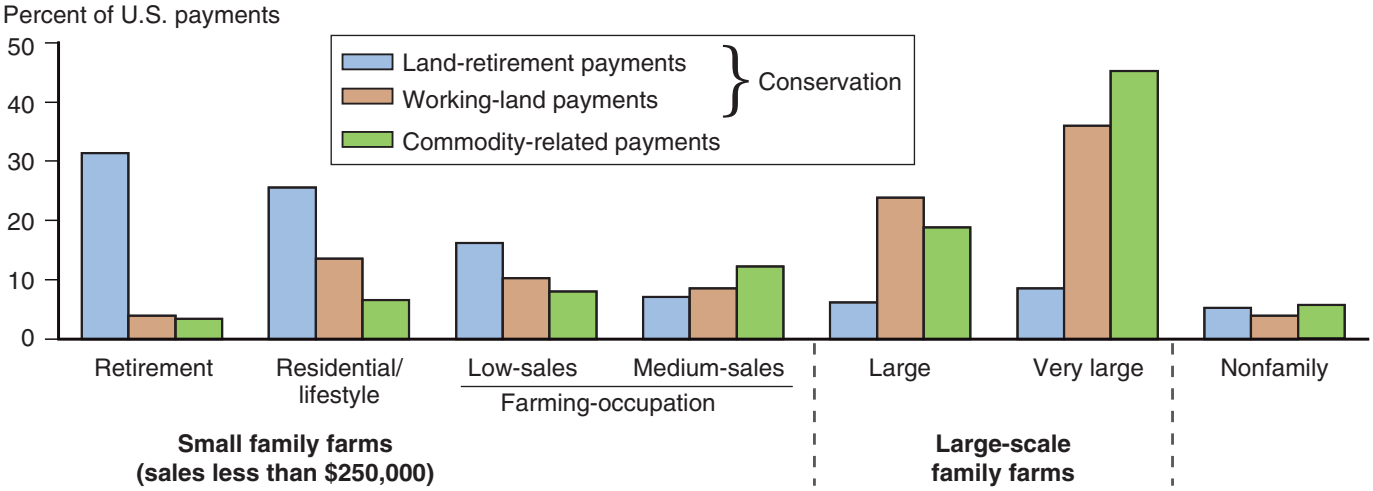
Note: For definitions of conservation program payments and commodity-related payments, see box, "Types of Farm Program Payments," on page 33 of this report.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Figure 12

Distribution of Government payments by farm type, 2007

Small farms receive most land-retirement payments, while large-scale farms receive most working-land and commodity-related payments



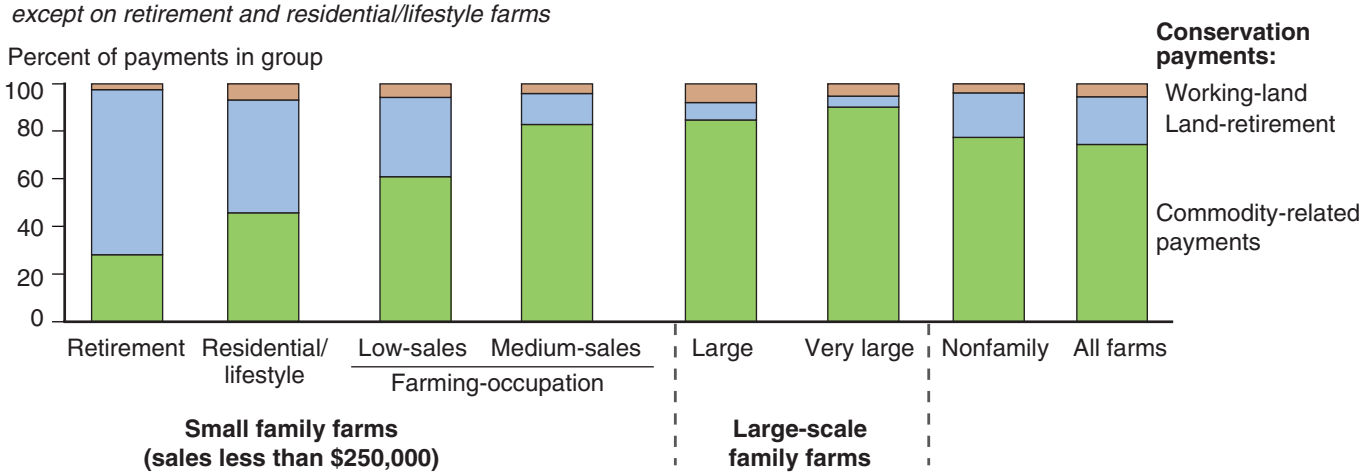
Note: For definitions of conservation program payments and commodity-related payments, see box, "Types of Farm Program Payments," on page 33 of this report.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Figure 13

Source of Government payments by farm type, 2007

Commodity-related payments account for most Government payments, except on retirement and residential/lifestyle farms



Note: For definitions of conservation program payments and commodity-related payments, see box, "Types of Farm Program Payments," on page 33 of this report.

Source: USDA, Economic Research Service and National Agricultural Statistics Service, 2007 Agricultural Resource Management Survey, Phase III.

The distribution of working-land payments between small and large-scale family farms is similar to that of commodity-related payments (fig. 12), with about three-fifths of the payments going to large-scale farms. Both types of programs—directly or indirectly—target production:

- Production of specific commodities, in the case of commodity-related programs.
- Environment problems on land in production, in the case of working-land programs.

The target of land-retirement programs, however, is environmentally sensitive land to remove from production, so the distribution of conservation payments differs from those of commodity-related payments or working-land payments. Retirement, residential/lifestyle, and low-sales farms received 73 percent of land-retirement payments in 2007, reflecting their large numbers (84 percent of all farms), their large share of farmland (51 percent of the land owned by farms), and their tendency to enroll large shares of their land in land-retirement programs when they do participate. Enrollments in land-retirement programs account for 54 percent of the land operated on participating retirement farms, 40 percent on participating residential/lifestyle farms, and 27 percent on participating low-sales farms. In contrast, enrollment ranges from 5 percent to 12 percent for participating medium-sales farms and large-scale farms.

The main occupation of residential/lifestyle operators is off the farm, which limits the amount of time they can spend farming. Since acreage enrolled in land-retirement programs requires little labor or capital investment and provides a guaranteed income stream, residential/lifestyle farmers may find the programs financially attractive, particularly if their farms are not profitable. Given their age, many retired farmers and older farmers on low-sales operations have land available to put into conservation uses.

Contracting

Contracts can potentially provide benefits to both producers and contractors (MacDonald and Banker, 2005, pp. 52-53, MacDonald et al., 2004, pp. 24-30). Farmers get a guaranteed outlet for their production with known compensation, while contractors get an assured supply of commodities with specified characteristics, delivered in a timely manner. ERS defines two types of contracts in ARMS—marketing contracts and production contracts (see box, "Types of Contracts").

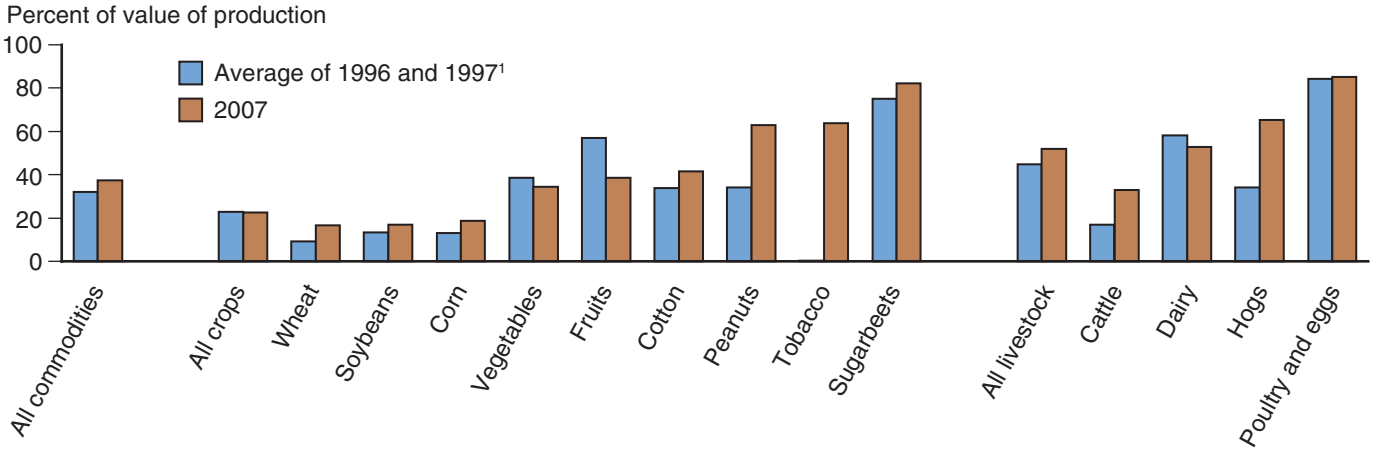
Production Under Contract

Although contracts account for nearly two-fifths of U.S. agricultural production, the share varies by commodity (fig. 14). For example, U.S. farmers produce 85 percent of poultry under contract. Contracting also accounts for at least half of the production of peanuts, tobacco, sugarbeets, dairy products, and hogs. At the other extreme, only small portions of wheat, soybeans, or corn—all traditional field crops—are grown under contract.

The aggregate data show slow and steady growth in contracting over the years, but change can be more rapid for some commodities. For example, the share of total agricultural production under contract grew by only 5 percentage points between 1996-97 and 2007, from 32 percent to 37 percent. During the same period, however, the share of tobacco production covered by contracts went from less than 1 percent to 64 percent. Cigarette manufacturers replaced cash auctions with contract marketing because contracts better enabled them to acquire enough of the specific types of tobacco they needed (MacDonald and Banker, 2005, pp. 58).

The share of peanuts grown under contracts also increased rapidly, from 34 percent in 1996-97 to 63 percent in 2007. The 2002 Farm Act ended the

Figure 14
Share of value of production under marketing or production contracts for selected commodities, 1996-97 and 2007
Shares of peanuts, tobacco, and hogs sold or removed under contract increased dramatically



[1]An average of 1996 and 1997 was used to provide a more statistically reliable estimate.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 1996, 1997, and 2007 Agricultural Resource Management Survey, Phase III.

peanut marketing quota established during the Great Depression. Quota owners received quota buyout payments and became eligible for the same type of Government payments received by other farmers. Peanut producers also managed price risk through marketing contracts with peanut shellers and other peanut buyers (Dohlman and Livezey, 2005, pp. 4 and 11).

The increase in the contracting share of hogs—from 34 to 65 percent—was of the same magnitude as the increase for peanuts. Growth in hog contracting was driven in part by production differentiation. Processors wanted more control over the characteristics of the hogs they acquired, which helped them provide a consistent quality of meat to consumers (MacDonald and Banker, 2005, pp. 59).

Variation by Type of Farm

Use of contracts varies by farm type, as shown in table 11. The share of retirement and residential/lifestyle farms using contracts is relatively low, 2 and 4 percent, respectively. For the remaining types of family farms, the use of contracts increases with sales, ranging from 7 percent of low-sales farms to 57 percent of very large family farms. The share of their production under contract also increases with sales.

Although a relatively small percentage of each small-farm type has contracts, small farms make up about half of the farms with contracts, reflecting the

Table 11
Farms with contracts and value of production under contract by farm type, 2007

Item	Small family farms				Large-scale farms		Nonfamily farms	All farms
	Retirement	Residential/ lifestyle	Farming-occupation: Low-sales	Farming-occupation: Medium-sales	Large	Very large		
				Number				
Total farms	403,828	989,830	434,599	111,389	93,601	110,152	53,393	2,196,791
				Percent of group				
Farms with contracts[1]	1.6	3.5	6.9	31.0	43.6	57.2	12.8	9.8
Value of production under contract[2]	8.0	11.0	9.9	18.4	28.0	45.0	43.2	37.4
				Percent of U.S. total				
Farms with contracts[1]	3.1	15.9	13.9	16.0	18.9	29.1	3.2	100.0
Value of production	1.6	4.2	4.0	6.6	12.2	53.7	17.7	100.0
Under contract[2]	0.3	1.2	1.1	3.2	9.1	64.5	20.5	100.0
Not under contract	2.3	6.0	5.7	8.6	14.1	47.2	16.1	100.0
				Percent of group				
Farm acts as contractor[3]	d	d	d	d	1.0	3.1	0.6	0.3

d = Data suppressed due to insufficient observations.
[1]Farms reporting production under production contracts, marketing contracts, or both.
[2]Includes commodities under production or marketing contracts.
[3]Another operation grows livestock (includes poultry) for the farm under a contract arrangement.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Types of Contracts

A *contract* is a legal agreement between a farm operator (contractee) and another person or firm (contractor) to produce a specific type, quantity, and quality of agricultural commodity. Farmers typically use two types of contracts, *marketing contracts* and *production contracts*.

Marketing contract. Ownership of the commodity remains with the farmer during production. The contract sets a price (or a pricing formula), product quantities and qualities, and a delivery schedule. Contractor involvement in production is minimal, and the farmer provides all the inputs. For crops, the contract is finalized before harvest. For livestock, the contract is finalized before the animals are ready to be marketed.

Production contract. The contractor usually owns the commodity during production, and the farmer is paid a fee for services rendered. The contract specifies farmer and contractor responsibilities for inputs and practices. The contractor often provides specific inputs and services, production guidelines, and technical advice. In livestock contracts, for example, contractors typically provide feed, veterinary services, transportation, and young animals. The contract is finalized before production of the commodity.

Source: MacDonald and Banker (2005) and MacDonald and Korb (2008).

large number of small farms. Production under contract, in contrast, is concentrated among large-scale family farms and nonfamily farms, which together account for 94 percent of the total. Very large family farms alone turn out 65 percent of the production under contract.

Large-scale family farms and nonfamily farms also generate a 77-percent share of production not under contract—sold in the cash or spot market—with very large family farms alone accounting for 47 percent. Three commodities make up three-fourths of noncontract production in the United States: high-value crops (20 percent), cash grain (33 percent), and beef (22 percent).

Farms as Contractors

Farms can also serve as contractors. The 2007 ARMS questionnaire asked if any other operations produced livestock—including poultry—under a contract arrangement for the farm being interviewed. About 7,300 farms—less than 1 percent of all U.S. farms—reported acting as a contractor, but the percentage was higher (3 percent) for very large family farms. Livestock valued at about $3.9 billion was placed on farms by contracting farms. Dairy herd replacements, other cattle, and hogs accounted for most of the placements.

Special Feature: Limited-Resource Farmers—Who Are They?

USDA has long been interested in identifying (and counting) limited-resource farms because it is charged with aiding those farms and their operators. The 2008 Farm Act, for example, requires USDA to:

- Exempt limited-resource farmers from the requirement that producers have more than 10 base acres to receive certain commodity-related Government payments.
- Make limited-resource farmers eligible for higher cost-sharing rates in EQIP.
- Exempt limited-resource farmers from certain crop insurance fees.[6]

In addition, USDA agencies with programs targeted at farms—such as the Farm Service Agency (FSA), the Risk Management Agency (RMA), and the Natural Resources Conservation Service (NRCS)—have outreach efforts to encourage the participation of limited-resource farmers.

Limited-resource farms are identified under four definitions in this special feature (see box, "Defining Limited-Resource Farms"). Based on the definition used, the number of farms varies under different—but reasonable—constraints on farm sales, operator household income, farm assets, and household net worth. Regardless of the definition used, however, the number of limited-resource farms is relatively low and the characteristics of the farms are similar. [7]

The Original Definition

Perry and Ahearn (1993) first identified limited-resource farmers for ERS, although they used the term "limited-opportunity" rather than "limited-resource." Their definition and analysis were based on 1988 data from the Farm Costs and Returns Survey (FCRS), a predecessor to ARMS. They defined limited-resource farms as those that met three criteria:

1. **Operator household income less than the poverty level.** Operator households with income at this level had an inadequate income from farming and other sources.

2. **Farm sales less than $100,000.** Farms with sales above this level were generally commercially viable.

3. **Farm assets less than $150,000.** The median value of assets for farms with sale less than $100,000 was approximately $150,000. Farms with assets below this level may have had insufficient assets to operate successfully.

Alternate Definitions

When ERS created its farm classification system in 1998, it included limited-resource farms as one category, using the original Perry-Ahearn definition, with one modification. Family income was required to be below $20,000

[6]Drawn from "2008 Farm Bill Side-By-Side: Provisions for Traditionally Underserved Groups" on the ERS website at: www.ers.usda.gov/farmbill/2008/titles/underserved.htm#titleix

[7]Data from version 1 of the 2007 Agricultural Resource Management Survey (ARMS) are used in this section, since that was the only version to identify limited-resource farms under the USDA-wide definition, one of the four definitions examined. For more information about the various versions of ARMS, see "Appendix II: The Agricultural Resource Management Survey."

per year rather than below the poverty level. Using a $20,000 income cutoff rather than the poverty level avoided the necessity of knowing household size—used to assign the appropriate poverty level to a family—which was not collected every year by ARMS or FCRS (Hoppe, 2001, p. 4) until recently. This modified original definition was used in the classification until the current definition was incorporated in the 2003 ARMS.

The current definition of limited-resource farms (U.S. National Archives and Records Admn., 2003, p. 32350) was developed by an interagency committee to provide a consistent definition across all USDA agencies. Both the modified original definition and the current definition use a $100,000 cutoff for farm sales, although the current definition indexes the cutoff to reflect price changes and applies the cutoff to both the current and previous year. The cutoff for household income is also set low in both definitions, but—as in the case of sales—2 years of low income are required under the current definition. An asset limitation was not used in the current definition because the assets held by farmers are difficult to verify on applications to participate in USDA programs. Instead, the requirement for a second year of low income—which is easier to verify than low assets—was added.

The third definition is an update of the original definition, to reflect current conditions in agriculture. As in the original definition, the income of households operating limited-resource farms must be less than the poverty level in a given year. Sales, however, must be less than $250,000—the current cutoff for small farms—which better reflects the level of sales required for a commercial-scale operation today. Farm assets must be less than $366,800, the median value of assets for farms with sales less than $250,000 in 2007.

Defining Limited-Resource Farms

Criterion	(1) Modified original definition	(2) Current definition (USDA-wide)	(3) Updated original definition	(4) Low-income, low-wealth
Operator household income	Less than $20,000 in the current year	Low in both the current and previous year; income is low if it is less than the poverty level for a family of four with two children—$21,027 in 2007—or if it is less than half the county median household income	Less than the appropriate poverty level in the current year	Less than the median for all U.S. households in the current year ($50,200 in 2007)
Sales	Less than $100,000, with no indexing	Low sales in both the current and previous year; low sales is defined as less than $100,000 in 2003 and indexed thereafter	Less than $250,000, with no indexing	No limit
Farm assets	Less than $150,000	No limit	Less than $366,800	No limit
Operator household net worth	No limit	No limit	No limit	Less than the median for all U.S. households ($120,300 in 2007)

Under the fourth definition, the income of the household operating a limited-resource farm must be less than the median for all U.S. households in a given year, and its net worth must be less than the median for all U.S. households. This "low-income, low-wealth" group is one category of the joint income/wealth indictor developed by ERS (Mishra et al., 2002, pp. 39-44).[8]

Counts and Constraints

The count of limited-resource farms is sensitive to the constraints on farm assets or household net worth. The count is lowest—65,800 and 82,500 farms, respectively—under the modified original definition and the low-income, low-wealth definitions (table 12). These definitions each classify 3 or 4 percent of U.S. farms as limited-resource. The modified original definition has the most restrictive constraint on farm assets ($150,000), and the low-income, low-wealth definition constrains net worth at $120,300.

The updated original definition has a higher farm asset constraint ($366,800) than the modified original definition, which increases the number of limited-resource farms to 143,000 (7 percent of all farms). Finally, 255,000 farms (12 percent of all farms) were classified as limited-resource under the current USDA-wide definition, which has neither an asset nor a net worth constraint. The variation in the assets or net worth constraints is also reflected in the relatively large range in median farm assets and median household net worth among the four definitions.

Similarities

Some farm, operator, and household characteristics are common among limited-resource farms, regardless of the definition used. All four definitions have a household income constraint, which means that median income is low under each definition and falls within a fairly narrow range—between $9,300 and $22,000. The majority of households operating limited-resource farms have a positive household income but experience losses from farming. This is also true, however, for "other farm households," those not classified as limited-resource under any definition.

Limited-resource farms are very small. Median acres operated range from 26 to 75 acres under the four definitions, compared with 97 acres for other farms. Median annual sales are also small, in the $1,300 to $3,600 range, compared with $6,800 for other farms.

A few limited-resource farms generate sales of $100,000 or more, however, and are classified as medium-sales or large-scale farms. This includes 3 percent of limited-resource farms under the low-income-low wealth definition (which has no sales constraint) as well as 3 percent under the updated original definition (which constrains sales at less than $250,000). The current definition originally constrained farm sales at $100,000 in 2003, but the constraint is indexed for price changes and crept up to $115,600 by 2007. As a result, a small share of limited-resource farms under the current definition (less than 1 percent) has sales of $100,000 or more.

Demographically, limited-resource farmers are much like other farmers. Regardless of the definition used, limited-resource farmers—like farmers in

[8]The 2007 Census of Agriculture also estimated the number of limited-resource farms. It defined limited-resource farms as those selling less than $100,000 of agricultural products run by a primary operator household receiving less than $20,000 in total income (USDA, NASS, 2009, p. B-9). The census definition is not examined here because it has no constraints on assets, net worth, the previous year's sales, or the previous year's household income. For additional information on limited-resource farms from the 2007 Census of Agriculture, see "Appendix I: Comparing the Census and ERS Farm Classifications."

Table 12

Selected characteristics of limited-resource farms and their operators under alternate definitions, 2007

Item	Modified original definition	Current definition (USDA-wide)	Updated original definition	Low-income, low-wealth definition	Other farm households[1]
			Number		
Farms and operator households	65,758	254,992	143,021	82,464	1,786,546
			Percent of U.S. total		
Share of all operator households[2]	3.1	11.8	6.6	3.8	82.9
			Dollars per household or farm		
Median household income	9,340	10,440	5,796	22,000	63,170
Median farm assets	76,500	366,434	189,825	67,975	459,242
Median household net worth	124,125	394,692	266,687	78,062	647,612
Median gross sales	1,333	3,600	2,000	1,450	6,800
			Percent of households		
Positive household income and loss from farming	57.7	56.1	50.5	66.0	58.0
			Acres per farm		
Median acres operated	26	75	46	26	97
			Percent of group		
Farms by type:					
Retirement	44.5	47.2	28.9	d	15.1
Residential/lifestyle	d	19.3	37.6	53.3	50.2
Low-sales	d	32.8	30.5	d	17.5
Medium-sales or large-scale	na	0.6	3.0	2.8	17.3
			Percent of operators		
Principal operator is:					
Male	78.7	78.6	80.8	79.2	90.4
Married	48.3	55.4	61.9	58.9	85.7
Education of principal operator:					
Less than high school	27.7	24.4	27.0	25.3	7.9
High school	45.0	47.4	42.8	42.3	40.9
Some college or graduated	27.2	28.2	30.1	32.3	51.2
			Years		
Mean age of principal operator	58	66	56	53	56
			Percent of operators		
Principal operator age 65 or more	23.1	57.9	32.3	30.4	24.6

d = Data suppressed due to insufficient observations. na = Not applicable.

[1]Farms that do not qualify as limited-resource under any of the definitions.

[2]The row sums to more than 100 percent because individual farms may be classified as limited-resource under more than one definition.

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III, version 1.

general—are overwhelmingly male. Most limited-resource farmers are also married, with the married share ranging from just under one-half to three-fifths, depending on the definition. An even larger share of other operators (86 percent), however, reports they are married. This means that limited-resource households are less likely than other farm households to have two potential workers—the operator and spouse—to generate farm and off-farm income.[9]

[9]Due to sample-size issues, no information can be presented about the share of limited-resource farmers who belong to minority racial or ethnic groups.

Compared with other farm operators, limited-resource operators have lower educational attainment, which may contribute to their low levels of income and resources. Between 24 and 28 percent of operators of limited-resource farms, or three times the 8-percent rate for other operators, did not receive a high school diploma. At the other end of the educational spectrum, about 30 percent of the limited-resource operators under each definition attended or graduated from college, compared with 51 percent of other operators.

A Major Difference

As pointed out above, limited-resource farms have a number of common characteristics, regardless of the definition used. Limited-resource farms identified by the current definition, however, are different from farms under other definitions in one respect—the age of the principal operator. Operators of farms under the current definition average 66 years of age, higher than operators under any other definition. About 58 percent are at least 65 years old, substantially higher than the 23- to 32-percent share under the other definitions, and double the 25-percent share for operators not classified as limited-resource.

Limited-resource farmers under the current definition appear to be older operators who have either retired or are scaling back their farm business. Forty-seven percent operate retirement farms, but another 33 percent are more actively engaged in farming and operate low-sales farms. The high level of farm assets in 2007 under this definition—a median of $366,400—suggests that these operators may have farmed on a larger scale in the past.

Overlap

Considerable overlap exists among the farms identified as limited-resource under the four definitions (table 13), which helps explain why limited-resource farms identified by the different definitions often have similar characteristics. The overlap is most pronounced for the modified original definition. Ninety-eight percent of these farms are classified as limited-resource farms by two or more definitions (including the modified original definition). At the other extreme, only 36 percent of farms under the current definition are limited-resource under two or more definitions. As a result, farm operators classified as limited-resource under that definition had some unique characteristics related to their age.

Table 13
Overlap among limited-resource farms definitions, 2007

Item	Modified original definition	Current definition (USDA-wide)	Updated original definition	Low-income, low-wealth definition
		Number		
Farms and operator households	65,758	254,992	143,021	82,464
		Percent of farms		
Farms classified as limited-resource under:				
Modified original definition	100.0	20.3	33.7	38.2
Current definition (USDA-wide)	78.8	100.0	49.6	42.4
Updated original definition	73.3	27.8	100.0	33.9
Low-income, low-wealth	47.9	13.7	19.5	100.0
Farm classified as limited-resource by two or more definitions	97.9	35.8	59.8	55.8

Source: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III, version 1.

Conclusions

This report has five major findings important to understanding farms and farm households, today and in the future:

1. Large-scale family farms and nonfamily farms now account for about four-fifths of U.S. agricultural production. Million-dollar farms alone account for half of agricultural production. Yet, small farms make significant contributions to the production of specific commodities.

2. Farming is generally considered a purely rural pursuit. Nevertheless, two-fifths of U.S. farms and agricultural production are located in metro areas. High-value crops account for a large share of metro production, even outside the Fruitful Rim.

3. Large-scale family farms are generally viable economic businesses, with favorable financial ratios. Small family farms are less viable as businesses, but the households operating them receive substantial off-farm income and do not rely primarily on their farms for their livelihoods.

4. There are relatively few limited-resource farmers, regardless of the definition used. The number of limited-resource farmers, however, is sensitive to any farm asset or household wealth constraints imposed in the definitions.

5. Different types of farm program payments go to different types of farms. Most payments from commodity-related and working-land programs go to large-scale family farms because these programs target production (directly or indirectly). Land-retirement programs, in contrast, target environmentally sensitive land and go mostly to retirement, residential/lifestyle, and low-sales small farms.

Large-Scale Farms Produce the Most Output

Large-scale family farms reported 66 percent of the value of U.S. agricultural production in 2007, and nonfamily farms contributed another 18 percent of production. Million-dollar farms alone, numbering only 47,600, produced 53 percent of U.S. agricultural output in the same period and dominated the production of high-value crops, hogs, dairy, poultry, and beef. The largest million-dollar farms—those with sales of at least $5 million in a given year—accounted for 35 to 45 percent of the production of high-value crops, beef cattle (largely in feedlots), and milk. The large share of these products produced by $5 million farms suggests economies of scale still exist even when sales exceed $5 million.

Nevertheless, small farms reported significant shares of production of specific commodities, including 23 percent of the value of production for cash grains and soybeans, 51 percent for hay, 34 percent for tobacco, and 22 percent for beef (largely from cow-calf operations). All these shares were larger than small farms' overall 16-percent share of U.S. production.

Farming in Metropolitan Areas

Farming is often assumed to be a purely rural pursuit. But, two-fifths of farms and farm production are located in metro areas, defined as a county or group of counties with an urban population concentration of at least 50,000 people. The share of farms located in metro areas is particularly high in the Fruitful Rim, where it reaches 67 percent.

Metro areas—considered as a whole—have a different agricultural production mix than nonmetro areas. High-value crops and dairy products make up a larger share of output in metro areas, while cash grains and beef make up a smaller share. The commodities that are produced in U.S. metro areas reflect the production mix in the Fruitful Rim, which accounts for 43 percent of total metro production. California alone accounts for 65 percent of metro production in the Fruitful Rim and 28 percent of total U.S. metro production.

Production in metro areas outside the Fruitful Rim looks more like that in nonmetro areas. In nonmetro areas and in metro areas excluding the Rim, a diversified livestock sector makes up one-half of production, and cash grains make up another 30 percent. The composition of the livestock sector varies between non-Rim metro areas and nonmetro areas, however.

Nevertheless, the share of production from high-value crops is more than twice as high in metro counties outside the Rim as in nonmetro counties, 16 and 6 percent, respectively. This may reflect shifts by producers in metro areas to commodities that generate returns high enough to compensate for higher property taxes incurred as land prices increase with local development (Heimlich and Anderson, 2001, pp. 38-42). The larger returns per acre for high-value crops relative to other commodities also allow operators to focus their production on fewer acres, which reduces their need to bid for farmland against competing uses. In the case of California, the climate and irrigation make farming especially competitive where agriculture and development meet in the State's large counties.

Financial Status of the Family Farm

The year 2007 was above average for farming. Net farm income averaged $35,100 per farm in 2007, 46 percent higher than in 2006. Only 3 percent of farms were classified as vulnerable (negative net cash farm income with a debt/asset ratio greater than 40 percent). Seventy-one percent of the vulnerable farms were residential/lifestyle farms, however, whose operators—by definition—rely on off-farm work for their livelihood.

For the most part, large and very large family farms were viable economic businesses. Their average profit margin and rates of return on assets and equity were all positive, and the large majority of these farms had a positive operating profit margin. Small farms—in contrast—were less viable as businesses. For retirement, residential/lifestyle, and low-sales farms, average operating profit margin and rates of return on assets and equity were negative. These ratios were positive for medium-sales farms but were substantially less than those of larger family farms. Nevertheless, some farms in each small-farm group had an operating margin of at least 20 percent.

Small-farm households typically receive substantial off-farm income, largely from wage and salary jobs or from self-employment. Because many small-farm households receive a large share of their income from off-farm work, macroeconomic and monetary policies affecting the nonfarm economy are important to them. The provisions in the tax codes allowing farmers to write farm losses off against other income (Durst, 2009, pp. 4-6) are also important to operators of residential/lifestyle farms with substantial off-farm earned income. Finally, the status of retirement programs is important to operators of retirement farms and to older operators in other farm types as they approach retirement.

Limited-Resource Farms: Few in Number

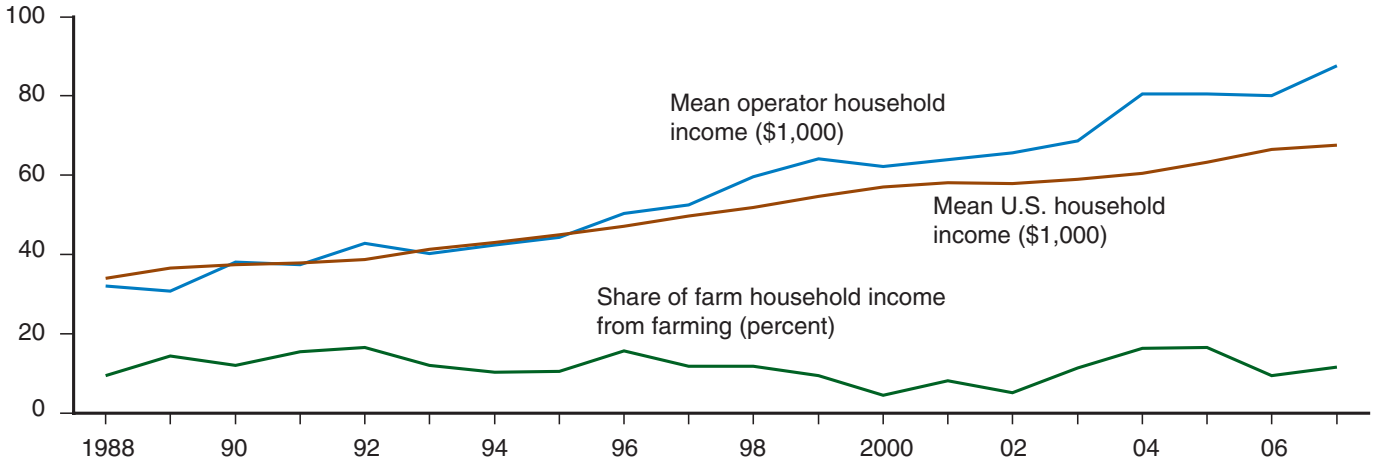
The number of limited-resource farms is sensitive to the asset or wealth constraints used in the definitions. Under the three definitions with either of these constraints, the count of limited-resource farms falls within a relatively narrow range, from 65,800 to 143,000 farms (between 3 and 7 percent of all U.S. farms). Under the sole definition without an asset/wealth constraint—the one currently used by USDA—the number of limited-resource farms reaches 255,000, or 12 percent of all farms. In other words, there are relatively few limited-resource farms, regardless of the definition used.

Limited-resource farms have some common characteristics under all the definitions. Limited-resource operators are generally male and married. They have lower levels of education, however, than farmers who are not classified as limited-resource. Limited-resource farms are generally small, whether size is measured in acres or sales, and the households operating these farms typically lose money farming. Overlap among the farms identified as limited-resource under the four definitions helps explain these common characteristics. The overlap also implies that many of the same farms will be identified regardless of the definition used.

The number of limited-resource farmers declined from 200,300 in 1988 under the original definition (Perry and Ahearn, 1993) to 143,000 in 2007 under the updated original definition, the definition most comparable to the original definition. Both definitions have a household income constraint based on the poverty level, a sales constraint consistent with a commercially viable operation, and an asset constraint based on median assets for farms meeting the sales constraint.

Increasing household income helps explain the decline in the number of limited-resource farms over time. Average household income grew more rapidly for farm households than for U.S. households in general—particularly after 1995—resulting in a growing gap between farm and other households, in favor of farm households (fig. 15). Most of the growth in farm households' income came from off-farm sources. Farming's contribution to farm household income has never exceeded 17 percent since 1988.

Figure 15
Mean operator household income, share from farming, and mean U.S. household income, 1988-2007
Mean income has consistently been higher for farm households since 1996



Sources: USDA, Economic Research Service and National Agricultural Statistics Service, 1988-1995 Farm Costs and Returns Survey and 1997-2007 Agricultural Resource Management Survey, Phase III, for farm households. U.S. Department of Commerce, U.S. Census Bureau, Current Population Survey for all U.S. households.

Different Farms, Different Policies

Which farms receive Government payments varies by type of program. Payments from commodity-related programs are roughly proportional to the harvested acres of program commodities. As a result, medium-sales small farms and the two types of large-scale farms collectively received 76 percent of commodity-related Government payments in 2007. Working-land programs do not directly target production. They do, however, target land in production. This results in most working-land payments going to large-scale farms.

In contrast, land-retirement programs target environmentally sensitive land rather than commodity production. As a result, retirement, residential/lifestyle, and low-sales small farms received 73 percent of land-retirement payments in 2007. This distribution reflects the large numbers of farms in these groups, their large aggregate landholdings, and their tendency to enroll large shares of their land in land-retirement programs. Land-retirement programs have relatively low labor and capital requirements, which makes the programs attractive to residential/lifestyle farmers, who spend most of their work time off the farm, and to retired or older low-sales farmers, who have scaled back their operations.

A majority of farms, 61 percent in 2007, do not receive Government payments. Nevertheless, these farms—and the households that operate them—may be affected indirectly by Government payments. For example, various analyses indicate that Government payments have increased crop production between 1 and 6 percent over time (USDA, OCE, 2003, p. 8). Thus, livestock producers who do not receive Government payments may benefit from lower feed prices due to an increased supply of grain.

References

Ahearn, Mary C., Janet E. Perry, and Hisham S. El-Osta. *The Economic Well-Being of Farm Operator Households, 1988-90*. AER-666. U.S. Dept. Agr., Econ. Res. Serv., January 1993.

Allen, Rich. "How to Interpret New Demographic Information in the Preliminary 2002 Census of Agriculture Release." Paper presented at the 2004 Agricultural Outlook Forum. Arlington, VA, February 19-20, 2004. (Available at: http://ageconsearch.umn.edu/bitstream/33028/1/fo04al02.pdf.)

Cash, A. James, II. "Where's the Beef? Small Farms Produce Majority of Cattle," *Agricultural Outlook*, U.S. Dept. Agr., Econ. Res. Serv., AGO-297, December 2002, pp. 21-24. (Available at: www.ers.usda.gov/publications/agoutlook/dec2002/.)

Claassen, Roger, and Marc Ribaudo. "Conservation Policy Overview," in *Agricultural Resources and Environmental Indicators, 2006 Edition*. Keith Wiebe and Noel Gollehon, editors. EIB-16. U.S. Dept. Agr., Econ. Res. Serv., July 2006, pp. 168-174. (Available at: www.ers.usda.gov/publications/arei/eib16/chapter5/5.1/.)

Cochrane, Willard W. *The Development of American Agriculture: A Historical Analysis.* Minneapolis, MN: University of Minnesota Press, 1993.

Dohlman, Erik, and Janet Livezey. *Peanut Backgrounder*. OCS-05i-01. U.S. Dept. Agr., Econ. Res. Serv. October 2005. (Available at: www.ers.usda.gov/publications/ocs/oct05/ocs05i01/.)

Durst, Ron. *Federal Tax Policies and Farm Households.* EIB-54. U.S. Dept. Agr., Econ. Res. Serv. May 2009. (Available at: www.ers.usda.gov/publications/eib54/.)

Farm Financial Standards Council. *Financial Guidelines for Agricultural Producers: Recommendations of the Farm Financial Standards Council*, January 2008.

Fuglie, Keith O., James M. MacDonald, and Eldon Ball. *Productivity Growth in U.S. Agriculture*. EB-9. U.S. Dept. Agr., Econ. Res. Serv., September 2007. (Available at: www.ers.usda.gov/publications/eb9/.)

Gale, Fred. "The Graying Farm Sector: Legacy of Off-Farm Migration," *Rural America*, U.S. Dept. Agr., Econ. Res. Serv., Vol. 17, Issue 3, Fall 2002, pp. 28-31. (Available at: www.ers.usda.gov/publications/ruralamerica/ra173/.)

Gale, H. Frederick, and David H. Harrington. "U.S. Farms—Diversity & Change," *Agricultural Outlook*, U.S. Dept. Agr., Econ. Res. Serv., AO-198, July 1993, pp. 3-6.

Harrington, David H., Robert A. Hoppe, R. Neal Peterson, David Banker, H. Frederick Gale, Jr. "Changes in the Farm Sector," in *Financing Agriculture*

into the Twenty-first Century. Marvin Duncan and Jerome M. Stam, editors. Boulder, CO: Westview Press, 1998.

Harris, J. Michael, Kenneth Erickson, John Dillard, Mitch Morehart, Roger Strickland, Robert Gibbs, Mary Ahearn, Ted Covey, Faqir Bagi, Dennis Brown, Chris McGath, Steve Vogel, Bob Williams, and Jim Johnson. *Agricultural Income and Finance Outlook*. AIS-86. U.S. Dept. Agr., Econ. Res. Serv., December 2008. (Available at: http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1254.)

Heimlich, Ralph E., and William D. Anderson. *Development at the Urban Fringe and Beyond: Impacts on Agriculture and Rural Land.* AER-803. U.S. Dept. Agr., Econ. Res. Serv., June 2001. (Available at: www.ers.usda.gov/publications/aer803/.)

Hoppe, Robert A., editor. *Structural and Financial Characteristics of U.S. Farms: 2001 Family Farm Report.* AIB-768. U.S. Dept. Agr., Econ. Res. Serv., May 2001. (Available at: www.ers.usda.gov/publications/aib768/.)

Hoppe, Robert A., and David E. Banker. *Structure and Finances of U.S. Farms: 2005 Family Farm Report*. EIB-12. U.S. Dept. Agr., Econ. Res. Serv., May 2006. (Available at: www.ers.usda.gov/publications/eib12/.)

Hoppe, Robert A., and Penni Korb. *Understanding U.S. Farm Exits.* ERR-21. U.S. Dept. Agr., Econ. Res. Serv., June 2006. (Available at: www.ers.usda.gov/publications/err21/.)

Hoppe, Robert A., Penni Korb, Erik J. O'Donoghue, and David E. Banker. *Structure and Finances of U.S. Farms: Family Farm Report, 2007 Edition*. EIB-24. U.S. Dept. Agr., Econ. Res. Serv., June 2007. (Available at: www.ers.usda.gov/publications/eib24/.)

Hoppe, Robert A., Penni Korb, David E. Banker. *Million-Dollar Farms in the New Century*. EIB-42. U.S. Dept. Agr., Econ. Res. Serv., December 2008. (Available at: www.ers.usda.gov/publications/eib42/.)

Hoppe, Robert A., James M. MacDonald, and Penni Korb. *Small Farms in the United States: Persistence Under Pressure.* EIB-63. U.S. Dept. Agr., Econ. Res. Serv., February 2010. (Available at: www.ers.usda.gov/publications/eib63/.)

MacDonald, James, Janet Perry, Mary Ahearn, David Banker, William Chambers, Carolyn Dimitri, Nigel Key, Kenneth Nelson, and Leland Southard. *Contracts, Markets, and Prices: Organizing the Production and Use of Agricultural Commodities.* AER-837. U.S. Dept. Agr., Econ. Res. Serv., November 2004. (Available at: www.ers.usda.gov/publications/aer837/.)

MacDonald, James M., and David E. Banker. "Agricultural Use of Production and Marketing Contracts," in *Structural and Financial Characteristics of U.S. Farms: 2004 Family Farm Report.* David E. Banker and James M. MacDonald, editors. AIB-797. U.S. Dept. Agr., Econ. Res. Serv., March 2005. (Available at: www.ers.usda.gov/publications/aib797/.)

MacDonald, James M., William D. McBride, and Erik J. O'Donoghue. "Low Costs Drive Production to Large Dairy Farms," *Amber Waves*, U.S. Dept. Agr., Econ. Res. Serv., Vol. 5, Issue 4, September 2007, pp, 30-35. (Available at: www.ers.usda.gov/amberwaves/september07/features/dairy-farms.htm.)

MacDonald, James, and Penni Korb. *Agricultural Contracting Update, 2005*. EIB-35. U.S. Dept. Agr., Econ. Res. Serv., April 2008. (Available at: www.ers.usda.gov/publications/eib35/.)

McBride, William D., and Nigel Key. *Economic and Structural Relationships in U.S. Hog Production*. AER-818. U.S. Dept. of Agr., Econ. Res. Serv. February 2003. (Available at: www.ers.usda.gov/publications/aer818/.)

Mishra, Ashok K., Hisham S. El-Osta, Mitchell J. Morehart, James D. Johnson, and Jeffrey W. Hopkins. *Income, Wealth, and the Economic Well-Being of Farm Households.* AER-812. U.S. Dept. of Agr., Econ. Res. Serv. July 2002. (Available at: www.ers.usda.gov/publications/aer812/.)

Mishra, Ashok K., Ron L. Durst, and Hisham S. El-Osta. "How Do U.S. Farmers Plan for Retirement?" *Amber Waves*, U.S. Dept. Agr., Econ. Res. Serv., Vol. 3, Issue 2, April 2005, pp. 12-18. (Available at: www.ers.usda.gov/amberwaves/april05/features/farmretirement.htm.)

Perry, Janet E., and Mary C. Ahearn. *Limited Opportunity Farm Households in 1988*. AIB-662. U.S. Dept. Agr., Econ. Res. Serv., February 1993.

Sommer, Judith E., Robert A. Hoppe, Robert C. Green, and Penelope J. Korb. *Structural and Financial Characteristics of U.S. Farms, 1995: 20th Annual Family Farm Report to Congress.* AIB-746. U.S. Dept. Agr., Econ. Res. Serv., December 1998. (Available at: www.ers.usda.gov/publications/aib746/.)

U.S. Department of Agriculture, Economic Research Service. *Farm Resource Regions.* AIB-760. September 2000. (Available at: www.ers.usda.gov/publications/aib760/

U.S. Department of Agriculture, National Agricultural Statistics Service (USDA, NASS). *1997 Census of Agriculture*. Vol. 3, Special Studies; Part IV: Agricultural Economics and Land Ownership Survey (1999). AC97-SP-4. December 2001.

U.S. Department of Agriculture, National Agricultural Statistics Service (USDA, NASS). *2007 Agricultural Resource Management Survey (ARMS), Phase III-Cost and Returns Report, Survey Administration Manual*. January 2008.

U.S. Department of Agriculture, National Agricultural Statistics Service (USDA, NASS). *2007 Census of Agriculture*, Vol. 1: Geographic Area Series, Part 51: United States Summary and State Data. February 2009.

U.S. Department of Agriculture, National Commission on Small Farms (USDA, NCSF). *A Time to Act: A Report of the USDA National Commission on Small Farms*. Miscellaneous Publication 1545 (MP-1545). January 1998.

U.S. Department of Agriculture, Office of the Chief Economist (USDA, OCE). *Report of the Commission on the Application of Payment Limitations for Agriculture, Submitted in Response to Section 1605, Farm Security and Rural Investment Act of 2002*. August 2003.

U.S. Department of Commerce, U.S. Census Bureau. *1978 Census of Agriculture,* Vol. 1: Summary and State Data, Part 51: United States, AC78-A-51. July 1981.

U.S. Department of Commerce, U.S. Census Bureau. "Money Income in the United States: 1998," *Current Population Reports*. Series P60-206. September 1999. (Available at: www.census.gov/prod/99pubs/p60-206.pdf).

U.S. Department of Commerce, U.S. Census Bureau. "Source and Accuracy of Estimates for *Income, Poverty, and Health Insurance Coverage in the United States: 2008.*" May 2010a. (Available at: www.census.gov/hhes/www/hlthins/data/incpovhlth/2008/p60_236sa.pdf).

U.S. Department of Commerce, U.S. Census Bureau. "Comparability of Current Population Survey Income Data with Other Data." June 2010b. (Available at: www.census.gov/hhes/www/income/data/comparability/index.html)

U.S. Department of Labor, Bureau of Labor Statistics (USDOL, BLS). *Employment and Earnings.* Vol. 55, No. 1, January 2008.

U.S. National Archives and Records Administration, Office of the Federal Register. *Federal Register*. Vol. 68, No. 104, May 30, 2003.

Appendix I: Comparing the Census and ERS Farm Classifications

The 2007 Census of Agriculture was the first census to prepare a farm typology, or farm classification (USDA, NASS, 2009, pp. B8-B9). Most of the farm types used by census and the Economic Research Service (ERS) are similar, with some minor wording differences (app. table 1), because the census typology was based on an earlier version of the current ERS classification. In both classification schemes, retirement farms through very large family farms—as listed in the table—are defined in terms of farm sales and the occupation of the farm operators.[10]

[10]For exact definitions of the farm types in the census typology, see Appendix B of United States Summary and State Data (USDA, NASS, 2009, pp. B-8 to B-9). For definitions of the farm types in the ERS classification, see the box "Farm Types, 2007" on page 1 of this report

There are two major differences between the classifications, however: the treatment of limited-resource farms and the definition of nonfamily farms. Limited-resource farms were dropped from the ERS classification but retained in the census typology. Nonfamily farms are included in both classifications but are defined in terms of ownership of the farm business by ERS—using data from the Agricultural Resource Management Survey (ARMS)—and in terms of farm organization in the census.

Limited-Resource Farms

As explained in the body of this report, the limited-resource category was eliminated from the ERS classification because it was inconsistent with the rest of the farm types. Nevertheless, the census retained limited-resource farms, identifying them as farms with sales less than $100,000 and operator household income less than $20,000 (app. table 2). This is similar to an earlier ERS definition of limited-resource farms, except the ERS definition also required farms assets to be less than $150,000 (Hoppe, 2001, p. 4). Unfortunately, an estimate of farm assets is beyond the scope of the census.

Although limited-resource farms are no longer included in the ERS classification, farms meeting the current USDA-wide definition of limited-resource farms can be identified in version 1 of ARMS. The count of limited-resource farms under this definition is about 18 percent less than the count under the census definition (app. table 2), reflecting the requirement for low household income and low sales for 2 successive years rather than just 1.

Nonfamily Farms

ERS currently defines a nonfamily farm as any farm where the operator and persons related to the operator do not hold a majority interest in the business. The census, in contrast, defines nonfamily farms as those organized as a nonfamily corporation or those operated by a hired manager, based on the definition used in the earlier version of the ERS classification (Hoppe, 2001, p. 4-5). The difference is substantial in this case, with ARMS identifying 41 percent fewer nonfamily farms (app. table 2).

A confounding factor may be uncertainty among census respondents over what exactly constitutes a nonfamily corporation. The distinction between family and nonfamily corporations has not been explained in the instructions for the census questionnaire since the 1997 census.

Comparability, Now and in the Future

In short, the current ERS and census classifications are not comparable, largely because they treat limited-resource farms differently and define nonfamily farms differently. The census has 308,800 limited-resource farms and an extra 37,800 nonfamily farms (the census count minus the ARMS count) that must be distributed among the other farm types in the ERS classification. As a result, the count of farms in the other farm types in the ARMS classification should be higher than the census count.

Appendix table 1

Farm classification: Census of Agriculture and ERS, 2007

Census typology		Current ERS farm classification	
	Number		*Number*
Limited-resource farms	308,837	*No limited-resource category*	—
Retirement farms	456,093	Retirement farms	403,828
Residential/lifestyle farms	801,844	Residential/lifestyle farms	989,830
Farming-occupation:		Farming-occupation:	
Lower sales farms	258,899	Low-sales farms	434,599
Higher sales farms	101,126	Medium-sales farms	111,389
Large family farms	86,551	Large family farms	93,601
Very large family farms	101,265	Very large family farms	110,152
Nonfamily farms	91,177	Nonfamily farms	53,393

Note: The count of farms from the census is slightly higher than the count from the Agricultural Resource Management Survey (ARMS) because the census includes Alaska and Hawaii while ARMS excludes them. For more information, see Appendix II in this report.

Sources: 2007 Census of Agriculture (USDA, NASS, 2009, pp. 236-262) and USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

Appendix table 2

Defining limited-resource and nonfamily farms in the census and ARMS

	Census		ARMS	
Type of farm	Number of farms	Definition	Number of farms	Definition
Limited-resource	308,837 (14.0% of all farms)	Farm meets two criteria: • Farm has sales less than $100,000 in a given year • Operator household income is less than $20,000 in a given year	254,992 (11.8% of all farms)	Two criteria:[1] • Low sales in the current and previous year • Low operator household income in the current and previous year
Nonfamily	91,177 (4.1% of all farms)	Includes two types of farms: • Nonfamily corporations • Farms operated by a hired manager	53,393 (2.4% of all farms)	Any farm where the operator and persons related to the operator do not own a majority of the business.

[1]For more detailed information, see box, "Defining Limited-Resource Farms," on page 41 of this report.

Sources: 2007 Census of Agriculture (USDA, NASS, 2009, pp. 236-262) and USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey, Phase III.

In fact, the number of farms in each of the other categories in the ERS classification is higher than the corresponding census count, with the exception of retirement farms (see app. table 1). The higher census count of retirement farms may reflect differences in the census and ARMS questionnaires. The census questionnaire simply asked if the operator was currently retired, while the ARMS questionnaire asked if the operator was currently retired from farming, planned to retire within the next 5 years, or planned to retire in more than 5 years. The more involved ARMS question apparently resulted in fewer operators responding that they were currently retired. Of course, the lower number of farms in the retirement category in ARMS raises the counts in other types of family farms relative to the census.

The two farm classifications could be made more comparable in the future by making three changes—two in the next census (the 2012 Census of Agriculture) and one in the 2012 ARMS:

1. Drop the limited-resource category from the census typology. This means that the census could drop the question on the level of the operator household income. It is difficult to accurately identify low-income households with the single question devoted to the topic in the census questionnaire.

2. Identify family farms in the census questionnaire by using the ARMS question that asks if more than 50 percent of the ownership interest in the farm is held by the operator and relatives of the operator. This would allow the census to more accurately distinguish between family and nonfamily farms.

3. Identify retired farmers in ARMS with the census question, which simply asks if the operator is retired. There is no reason for ARMS to delve into the operator's retirement plans in a census year.

If these actions are undertaken, the census could still provide a typology, and the typology would be more comparable to the ERS farm classification. Neither classification would identify limited-resource farms. Both would use the same family/nonfamily farm definition and identify retired operators with the same short question.

Appendix II: The Agricultural Resource Management Survey

Most of the farm business and farm household data in this report come from Phase III of the 2007 Agricultural Resource Management Survey (ARMS). This appendix presents a brief overview of Phase III. For more detailed information, see the ARMS briefing room on the ERS website at www.ers.usda.gov/briefing/arms/ or the *2007 Survey Administration Manual* (UDSA, NASS, 2008).

ARMS is designed and conducted each year by the Economic Research Service (ERS) and the National Agricultural Statistics Service (NASS), both agencies of the U.S. Department of Agriculture. The survey is conducted in three phases:

1. Phase I is a screening survey used to identify farm operations eligible for sampling and to determine if they produce specific commodities targeted for Phase II that year. Phase I is conducted in the summer of the reference year. (The reference year for the survey used in this report is 2007.)

2. Phase II collects information about chemical use, production practices, and variable input costs for the production for specific commodities on selected sample farm operations. Data collection for Phase II occurs in the fall and winter of the reference year.

3. Phase III collects financial data on U.S. farm businesses and information about farm operators and their households. It is conducted in the spring of the year following the reference year, when financial data for the reference year become available. Farms contacted for Phase II are also contacted for Phase III, as are additional farms identified in Phase I that do not produce the target commodities.

Phase III Specifics

Phase III has been conducted since 1996, when the predecessor USDA surveys were merged: the Cropping Practices Survey (CPS) and Farm Costs and Returns Survey (FCRS). Prior to 1996—from 1984 to 1995—farm business and farm household data were collected by FCRS.

There are multiple versions of Phase III, each with its own questionnaire:

- **Version 1 of the Cost and Returns Report (CRR).** Used in all States to collect economic data for the whole farm business—not just information related to a particular commodity—as well as operator and operator household characteristics. In addition, version 1 generally asks more detailed questions about specific topics, such as farm management practices or types of Government payments received.

- **Commodity-specific CRR versions.** Farms that were contacted for information about the production of specific commodities in Phase II are also contacted to fill out a questionnaire for Phase III. The commodity-specific versions in 2007 were cotton (version 2) and apples

(version 3). Respondents provide whole-farm information, with some detail regarding the specific commodity.

- **CORE (Version 5)**.[11] This version was developed to increase sample size, using a simpler questionnaire and collecting whole-farm information. Most of the CORE questionnaires are mailed out, but the other versions are enumerated.

[11]There was no version 4 in 2007. The CRR version that is not commodity specific is always version 1 and the CORE is always version 5, even when there are fewer than five versions.

ARMS, Phase III is an annual survey that collects financial data on farm businesses and information on the farm operator and the operator household. The target population of the survey is all farming units in the 48 contiguous States that sell or normally would sell at least $1,000 of agricultural products during the calendar year covered by the survey. The survey typically includes 20,000-24,000 observations in its sample, covers all types of farms, and is designed to accurately represent farms and production in the continental United States (Hoppe et al., 2010, p 1). Differences are generally stressed in the text of this report only when estimates are significantly different at the 95-percent confidence level or higher.

ARMS excludes Alaska and Hawaii, largely to reduce the cost of the survey. Because Alaska and Hawaii are excluded, the count of farms is slightly lower in the 2007 ARMS (2,197,000) than in the 2007 census (2,245,000).

Operators and Their Households

ARMS collects detailed information about one operator per surveyed farm. In the case of farms with more than one operator, detailed information is collected about the primary operator and limited information is collected about secondary operators. Similarly, the survey collects detailed information about one primary household per farm and limited information about households of secondary operators.

In this report, the terms “household” and “family” are used interchangeably, although ARMS actually collects household data. There is a technical difference between a family and a household. A family is made up of two or more people who are related to each other. A household consists of all the people (related and unrelated) who live together in a housing unit. ARMS also includes people dependent on the household who live elsewhere, such as college students living away from home.

Coordination With the Census of Agriculture

The Census of Agriculture is currently conducted every 5 years. ARMS and census data collection are coordinated in census years (such as 2007), with ARMS questions integrated into the census questionnaires of those farms selected for the ARMS sample. The ARMS questions in a census year may not be identical to those on the census questionnaire, but they are similar enough to provide data for the census.

Appendix III: Measuring Operator Household Income and Net Worth

The Current Population Survey (CPS), conducted by the U.S. Census Bureau, is the source of official U.S. household income statistics. Thus, producing an estimate of farm household income from the Agricultural Resource Management Study (ARMS) that is consistent with CPS methodology allows income comparisons between farm operator households and all U.S. households.

The CPS definition of farm self-employment income is net money income from the operation of a farm by a person on his or her own account, as an owner or tenant. CPS self-employment income includes income received as cash but excludes in-kind or nonmoney receipts. No adjustments are made to the CPS income measure to reflect inventory changes, since inventory change is a nonmoney item. The CPS definition departs from a strictly cash concept by deducting depreciation, a noncash business expense, from the income of self-employed people.

Operator Household Income

Farm self-employment income from ARMS is the sum of farm business income (net cash farm income less depreciation) accruing to the principal operator's household plus wages paid to the operator. Adding other farm-related income to farm self-employment income equals earnings of the operator household from farming activities. (Other farm-related earnings consist of net income from a farm business other than the one being surveyed, wages paid by the farm business to household members other than the operator, and net income from farmland rental.)

Finally, adding off-farm income to earnings from farming activities equals total operator household income. Off-farm income can come from earned sources, such as wages, salaries, and self-employment income, or from unearned sources, such as interest, dividends, and transfer payments, including Social Security.

Operator Household Net Worth

ARMS is also the source of data for estimates of operator households' net worth. The net worth of farm operator households is defined as the difference between their assets and liabilities. It is calculated as the sum of the operator household's farm net worth and nonfarm net worth. If the net worth of the farm is shared with other households (such as the households of shareholders in a family corporation), only the operator household's share is included.

Additional Information

For more information on operator household income, see "Farm Household Economics and Well Being," a briefing room on the Economic Research Service (ERS) website at www.ers.usda.gov/briefing/wellbeing/). Household income estimates presented in this report are consistent with those from the

briefing room. Both sets of estimates are derived from ARMS for the principal operator households using CPS procedures.

Household income estimates cannot be derived from the sector estimates of net farm income presented in another ERS briefing room, "Farm Income and Costs" (www.ers.usda.gov/briefing/farmincome/). The farm sector estimates are estimated from several data sources and include all participants in farm production, including contractors and share landlords who do not farm. For more information, see Harrington et al. (1998, pp. 45-52).

Appendix IV: Government Payments—Survey Versus Administrative Data

The Agricultural Resource Management Survey (ARMS) collects information—including information about the receipt of farm program payments—directly from farmers. This allows analysts to show which types of farms receive various payments. For example, the body of this report shows that commodity-related payments flow largely to family farms with sales of at least $100,000, while land-retirement programs go mostly to smaller family farms. Although collecting information directly from farmers does allow linking Government payments to farm and farm operator characteristics, it may also introduce errors. For example, respondents may not be able to provide complete or accurate information due to incomplete records, difficulties in interpreting the questionnaire, or other reasons.

Another source of information on Government payments is administrative data based on the records maintained by the agencies that make the payments. Administrative data capture all the payments made (barring errors in recordkeeping), including payments made to nonoperator landlords who do not farm but still receive Government payments associated with their farmland. The Economic Research Service (ERS) uses administrative data from other agencies—aggregated to the State level—to estimate Government payments in its data series, "U.S. and State Farm Income" (also known as *the sector accounts*). Nevertheless, despite the completeness of the administrative data used in the sector accounts, Government payments from the accounts cannot be linked to farm and farm operator characteristics.

Total Payments From ARMS and the Sector Accounts

ARMS estimates of total Government payments are lower than the corresponding estimate from the sector accounts, by about $3.1 billion in 2007 (app. table 3). One reason for the difference is that ARMS excludes farm program payments made to nonoperator landlords—approximately $1.7 billion in 2007—while the sector accounts include them. ARMS contacts farm operators exclusively (and not nonoperator landlords), while the sector accounts include all Government payments, even those made to nonoperator landlords. In addition, all survey data are subject to sampling and nonsampling errors. These errors may also contribute to a smaller ARMS estimate, although they theoretically could make the estimates smaller or larger.

Defining the two types of errors is fairly straightforward (U.S. Department of Commerce, U.S. Census Bureau, 2010a, pp. 3-4; U.S. Department of Commerce, U.S. Census Bureau, 1999, pp. E-2 to E-3). Sampling error is the difference between an estimate based on a sample survey and the estimate that would occur if the sample included the whole population. Nonsampling error is the difference between an estimate based on a sample survey that includes the whole population and the true population value (approximated by the sector estimate, in this case). Sources of nonsampling error include:

- Farm operators are unable (or unwilling) to provide the correct responses.

- Farm operators forget minor or irregular payments.
- Farm operators (or interviewers) experience difficulties in interpreting the question.
- Errors occur in data processing, such as recording or coding the data incorrectly or losing questionnaires.
- Errors occur in imputing values for missing data.
- Some farm operators that should have been in the sample are missed (coverage error).

Appendix table 3
Government payments by program from ARMS and the sector accounts, 2007

Item	ARMS		Sector accounts[1]		
	Amount	Distribution	Amount	Distribution	Capture rate[2]
	Mil. $	*Percent*	*Mil. $*	*Percent*	
Not adjusted for nonoperator landlords					
Total Government payments	8,751	100.0	11,903	100.0	73.5
Commodity-related payments	6,516	74.5	8,831	74.2	73.8
Direct and counter-cyclical payments	5,242	59.9	6,185	52.0	84.8
Direct	4,160	47.5	5,060	42.5	82.2
Counter-cyclical	1,082	12.4	1,125	9.5	96.2
Marketing loan benefits[3]	145	1.7	1,115	9.4	13.0
Other commodity-related payments[4]	1,129	12.9	1,531	12.9	73.7
Conservation payments	2,234	25.5	3,072	25.8	72.7
Land-retirement[5]	1,757	20.1	1,929	16.2	91.1
Working-land[6]	477	5.5	620	5.2	76.9
Programs not listed in ARMS questionnaire[7]	—	—	523	4.4	—
Adjusted for nonoperator landlords[8]					
Total Government payments	8,751	100.0	10,156	85.3	86.2

[1]From the U.S. and State Farm Income Data series—the farm sector accounts—prepared by the Economic Research Service.
[2]The ratio of the ARMS estimate to the sector estimate, expressed as a percentage.
[3]Loan deficiency payments, marketing loan gains, and net value of commodity certificates.
[4]Disaster and market loss payments, peanut quota compensation, milk income loss contract payments, other Federal program payments, and State and local program payments.
[5]Conservation Reserve Program, Conservation Reserve Enhancement Program, Wetlands Reserve Program, and Farmable Wetlands Reserve Program.
[6]Environmental Quality Incentives Program and Conservation Security Program.
[7]Agricultural Conservation Program, Agricultural Management Assistance, Forestry Conservation Reserve, Grasslands Reserve Program, Soil/Water Conservation Assistance, Agricultural Management Assistance Program, Farmland Protection Program, Forestry Incentives Program, Wildlife Habitat Incentive Program, etc.
[8]Government payments to landlords ($1.7 billion) was subtracted from the sector estimate, to be consistent with ARMS.

Sources: USDA, National Agricultural Statistics Service and Economic Research Service, 2007 Agricultural Resource Management Survey (ARMS), Phase III. USDA, Economic Research Service, U.S. and State Farm Income Data (the farm sector accounts) at www.ers.usda.gov/data/farmincome/finfidmu.htm.

Capture Rates

ARMS captured 74 percent of the sector estimate of total Government payments in 2007. The sector estimate, however, is made up of two parts—the farm share of $10.2 billion and the nonoperator landlord share of $1.7 billion, mentioned earlier. If the ARMS estimate is compared only with the farm share of the sector estimate, the ARMS capture rate increases to 86 percent (see the bottom of the table).

The U.S. Census Bureau calculated a capture rate of the same magnitude as the ARMS rate when comparing income from its Current Population Survey (CPS) with an estimate based on administrative and other secondary data (U.S. Department of Commerce, U.S. Census Bureau, 2010b). Aggregate income from the CPS in recent years typically has captured about 89 percent of the aggregate personal income estimated by the Bureau of Economic Analysis. Interestingly, the 2007 Census of Agriculture has a 68-percent unadjusted capture rate for Government payments, 6 percentage points less than the 2007 ARMS rate in the table. Total Government payments in the census are $8 billion, or 9 percent less than the corresponding estimate from ARMS.

Program Categories

Nonoperator landlords' Government payments cannot be allocated to individual programs in the sector accounts. This means appendix table 3 understates the capture rates for different types of programs, since the ARMS estimates in the table—which exclude payments to nonoperator landlords—must be divided by sector estimates that do include those landlord payments. Nevertheless, examining the capture rate for each category gives an idea of the reliability of the ARMS estimate for different types of payments. Most ARMS estimates are reasonably close to the sector estimates, roughly within 70 to 90 percent of the corresponding sector estimates.

The sole exception is marketing loan benefits: ARMS captures only 13 percent of the sector estimate. In 2007, nearly all of those payments went to cotton producers, who often sold their cotton through cooperatives. The cooperatives collected marketing loan benefits as they sold the cotton and then passed the benefits on to their members. It may have been difficult for respondents to separate marketing loan gains from other receipts from their cooperatives. If this difficulty did indeed lower the estimate of marketing loan gains, a nonsampling error occurred.

Which Source To Use?

Both ARMS and the sector accounts provide useful information about Government payments. The choice of the data source to use depends on the questions under consideration. The sector accounts are preferable for aggregate totals, since ARMS does not survey all recipients while the sector accounts tally up all the payments made, program by program, even for small programs. Thus, the sector data are useful in understanding the size and composition of payments made by the Government to farmers. These data also are useful for following long-term trends in Government payments

because the sector accounts extend back to 1910, long before the inception of Government payments in the 1930s.

On the other hand, ARMS is useful in understanding who receives payments, since it collects detailed information on farm and household characteristics—which administrative data lack. Because ARMS is a survey of farmers, however, it underestimates payments, with the degree of underestimation varying by program category. This problem can be alleviated by focusing on less detailed categories. For example, this report focuses on total commodity-related payments rather than individual components of the category.