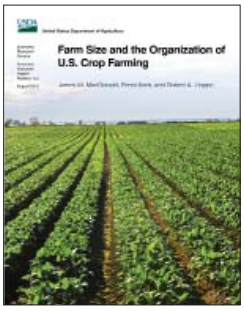
United States Department of Agriculture

A report summary from the Economic Research Service August 2013



Find the full report at *www.ers.usda.gov/publications/err-economic-research-report/err-152.aspx*

Farm Size and the Organization of U.S. Crop Farming

James M. MacDonald, Penni Korb, and Robert A. Hoppe

What Is the Issue?

Large farms now dominate crop production in the United States. Although most cropland was operated by farms with less than 600 crop acres in the early 1980s, today most cropland is on farms with at least 1,100 acres, and many farms are 5 and 10 times that size. This ongoing shift in farm structure raises a host of questions. How extensive is this structural change? What forces have accompanied and contributed to the shift to larger farms? What implications do these structural shifts have for family farms?

The shift of acreage to larger farms is part of a complex set of structural changes in crop agriculture. The number of mid-size crop farms has declined, while farm numbers at the extremes (large and small) are growing. Because of these changes, average farm size has changed little in the last three decades, even while cropland and crop production have shifted to much larger farms. The report documents the complex nature of modern farm structure and introduces statistics aimed at better tracking consolidation of land and production.

What Did the Study Find?

The report introduces a measure of midpoint acreage in which half of all *cropland acres* are on farms with more cropland than the midpoint, and half are on farms with less. Midpoint acreage is revealed to be a more informative measure of cropland consolidation than either a simple median (in which half of all *farms* are either larger or smaller) or the simple mean (which is average cropland per farm). Using this measure, ERS researchers found that:

- The midpoint acreage for U.S. cropland nearly doubled between 1982 and 2007, from 589 acres to 1,105.
- Midpoint acreages increased in 45 of 50 States and more than doubled in 16. The largest increases occurred in a contiguous group of 12 Corn Belt and Northern Plains States.
- Midpoint acreages more than doubled in each of 5 major field crops (corn, cotton, rice, soybeans, and wheat) and increased in 35 of 39 fruit and vegetable crops, where the average increase was 107 percent.

- The shifts were persistent, with a general pattern of increase between each Census of Agriculture conducted between 1982 and 2007. However, less comprehensive evidence from annual surveys suggests that the pace of consolidation slowed between 2007 and 2011, the last year for which data are available. Data from the 2012 Census will provide more definitive evidence of recent trends.

- Larger crop farms continue to realize better financial performance: average rates of return on equity increased with farm size in five major commodity categories analyzed in this report (corn, soybeans, wheat, fruits, and vegetables). In turn, larger farms utilize labor and capital more intensively, which provide them with the primary source of their financial advantage.

The long-term shifts in farm size have been accompanied by greater specialization—beginning with a separation of livestock farming from crop farming in the latter half of the 20th century. As crop and livestock production separated, full-time crop farmers could devote more time to crop production and manage more cropland. At the same time, the number of production and marketing contracts to govern the sale of products has increased. Contracts covered 32 percent of crop production in 2011, compared with 23 percent in the mid-1990s. Larger operations are more likely to use contracts, which can reduce the price and marketing risks faced by farmers.

Technology also plays an important role in driving increases in farm size, by allowing a single farmer to operate and manage more acres. Labor-saving innovations—from bigger and faster capital equipment to information technology, chemical herbicides, seed genetics, and changing tillage techniques—have substantially reduced the total amount of labor used in agriculture and facilitated the shift to larger crop farms.

Federal policies may affect farm structure through multiple channels, such as taxes, lending programs, environmental or food safety regulation, research and development funding, and commodity programs. Some effects are straightforward and fairly direct, while others are subtle and indirect. The impact of broad commodity policy is particularly complex. Some have argued that commodity and crop insurance programs, by reducing the financial risks faced by farmers, encouraged the adoption of organizational forms and capital equipment that spurred increases in farm size. It is, however, difficult to separate the impact of policy from technology itself and from other factors that affected farm risks.

While the above conditions may have facilitated the shifts toward larger farms, family farms continue to dominate crop agriculture. In 2011, 96 percent of U.S. crop farms were family farms, and they accounted for 87 percent of the value of crop production.

How Was the Study Conducted?

This study drew upon data from two main sources. The Census of Agriculture, conducted by the USDA's National Agricultural Statistics Service (NASS), provides comprehensive, historical, and publicly available data on consolidation and specialization trends. The study also relied on confidential farm-level data from the census accessed in a secure environment to ensure confidentiality, to generate measures of consolidation and farm size for the United States, and major commodities for 1982-2007.

The second primary source of data is the annual Agricultural Resource Management Survey (ARMS), jointly administered by NASS and ERS. The ARMS covers U.S. farming operations and their operators in the 48 contiguous States. The survey was used to supplement historic census data on consolidation with more recent annual developments, to provide data on financial performance among crop farms, to assess the role of family farms, and to provide evidence on the use of labor, capital, and various production practices among crop farms.

The study also used several additional datasets and publications from NASS, ERS, and other Government and private sources.