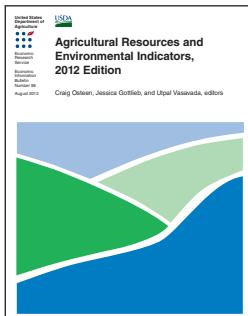


ERS Report Summary

Economic Research Service

August 2012

U.S. Department of Agriculture



This is a summary
of an ERS report.

Find the full report at
[www.ers.usda.gov/
publications/eib-economic-information-bulletin/eib98.aspx](http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib98.aspx)

Agricultural Resources and Environmental Indicators, 2012

Craig Osteen, Jessica Gottlieb, and Utpal Vasavada (editors)

Agricultural production depends on endowments such as knowledge, production technologies, and management skills, and it influences a wide range of natural resources, including land, water, and genetic material. Agricultural resource use depends on the decisions made by the operators of the Nation's 2.2 million farms, which are shaped, in turn, by market conditions, public policies, and the specific characteristics of individual farms and households. When making these decisions, farm operators have clear incentives to consider their own and their households' well-being, but incentives to consider more distant impacts are weaker.

What Is the Issue?

A new focus on social, economic, and environmental sustainability has increased demand for indepth information on agricultural production methods, their social and environmental effects, and ways to measure them. Consumers are now concerned not just with the cost of food, but also with long-term impacts on the environment and agricultural workers. However, there are no product- or process-based standards that regulate sustainable agricultural systems throughout the supply chain. Concise and accurate information about the current state of, and complex interactions between, public policies, economic conditions, farming practices, conservation, resources, and the environment can assist public and private decisionmaking.

What Did the Study Find?

Agricultural Resources and Environmental Indicators (AREI), 2012 discusses important economic, technology, policy, resource use, input use, and land management changes. Some changes can enhance while others degrade economic, social, or environmental sustainability. Notable findings include:

- Census data show that the **number of U.S. farms** varied between 2.1 and 2.2 million since 1992. In 2009, small farms made up 88 percent of all U.S. farms, but large-scale family and nonfamily farms accounted for more than 80 percent of the total value of production.
- In 2007, about 51 percent of the **2.3 billion acres in the United States was used for agricultural purposes**, including cropping, grazing (in pasture, range, and forests), and farmsteads and farm roads. Total cropland acreage in 2007 reached its lowest level since the Major Land Use series began in 1945. Over 1959-2007, forest-use land and grassland, pasture, and range also decreased, while land in special uses (primarily recreation areas, transportation, and national defense) and urban areas increased.
- From 2000 to 2010, national aggregate **farm real estate values** appreciated faster than residential values. Traditionally, farmland values were driven largely by the returns from

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

www.ers.usda.gov

agricultural activities, but today in some regions farmland values are influenced by factors such as urban influence and income from hunting leases. As a result, cropland values in these regions greatly exceed their implied agricultural use value.

- From 1948 to 2009, agricultural output grew 1.63 percent per year while aggregate input use increased only 0.11 percent annually, so positive growth in the farm sector was mainly due to **productivity growth** (1.52 percent per year).
- Total **agricultural research and development (R&D)** funding generally increased since 2000; private sector funding grew to exceed that of the public sector, which grew slowly and sporadically until 2006 before declining. Private sector R&D tends to emphasize marketable goods, while public sector R&D tends to emphasize public goods like environmental protection, nutrition, and food safety.
- Corn, cotton, and soybean growers have widely adopted **genetically engineered herbicide-tolerant and insect-resistant seeds** since 1996. Despite higher prices for genetically engineered seed than for conventional seeds, U.S. farmers are realizing economic benefits from increased crop yields, lower pesticide costs, and/or management time savings.
- Real expenditures (2010 US\$) and quantities for **pesticide** active ingredients declined an average 2.4 percent and 1.4 percent, respectively, per year during 1996-2007, even though expenditures and quantities applied increased from 2006 to 2007. However, herbicide use increased, and increasing glyphosate use on herbicide-tolerant crops and reduced diversity of weed management practices are associated with increased weed resistance.
- Commercial **fertilizer consumption** fell from 23 million short tons in 2004 to 21 million short tons in 2010, with high fertilizer prices contributing to the decline. Since 2004, nitrogen recovery rates (amount removed by harvested crop/amount applied) on corn and cotton have increased, and the shares of planted acreage where application rates exceed 125 percent of the crop's agronomic need have decreased. Phosphate recovery rates are relatively unchanged for corn and cotton. Mining phosphate in soybean plantings increased.
- In recent decades, onfarm **irrigation** efficiency—the share of applied water that is beneficially used by the crop—has increased: from 1984 to 2008, total irrigated acres in the West increased by 2.1 million acres, while water applied declined by nearly 100,000 acre-feet, reflecting improved water-use efficiency, as well as changes in irrigated acreage and regional cropping patterns.
- Since 2000, corn, cotton, soybean, and wheat acreage under **conservation tillage** (mulch, ridge, and no till) has increased, which may reduce soil erosion and water pollution but increase pest management costs. Over that same time, continuous corn and corn-inclusive rotations increased and continuous soybeans decreased due to higher corn prices, with uncertain effects on erosion and water pollution. **Erosion control structures and conservation buffers** are more widely used on highly erodible land than on other land, but overall, structures were more widely used and buffers less widely used on cotton and wheat than on corn and soybeans.
- From 2004 to 2011, **organic food sales** more than doubled from \$11 billion to \$25 billion, accounting for over 3.5 percent of food sales in 2011. In 2008, growers practiced certified organic production on less than 1 percent of U.S. cropland and pasture/rangeland, but the percentage is higher for fruit/vegetable crops and for dairy production.
- Federal funding for voluntary programs that encourage **land retirement and adoption of conservation practices** on working lands was \$5.5 billion in 2010, higher than at any time since 1960 (when expressed in 2010 dollars); funding increased nearly tenfold for working-land conservation from 2003 to 2010. Enrollment in the Conservation Reserve Program (CRP) peaked at 36.8 million acres in 2007, but the 2008 Farm Act cut maximum enrollment to 32 million acres and high crop returns have discouraged new CRP bids, so 29 million acres were under 10- to 15-year contracts as of June 2012. Goals of the CRP include soil conservation, improved water and air quality, and enhanced wildlife habitat. Total 2008-12 authorized funding for the Environmental Quality Incentive Program is \$7.25 billion; 60 percent is targeted for resource concerns in poultry and livestock production.