



# Irrigation

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## Results from the 2013 Farm and Ranch Irrigation Survey

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. . . irrigated 55.3 million acres of farmland in 2013, applying an average of 1.6 acre-feet of water.

### Understanding the Numbers

The 2013 Farm and Ranch Irrigation Survey (FRIS) was a follow up conducted with producers who indicated in the 2012 Census of Agriculture that they irrigate. FRIS collects detailed data on irrigation activities and water use on U.S. farms, ranches, and horticultural operations.

Because of a change in methodology, some data are not comparable between 2013 and 2008, when FRIS was last conducted. In 2008, the report form for horticultural operations did not include questions on the entire farm that were on the general form. In 2013, the survey collected entire-farm data for all operations (including horticultural operations).

FRIS findings aid in efforts to develop and promote efficient irrigation practices and ensure long-term sustainability of water resources. For more information on 2013 FRIS methodology and results, go to [http://bit.ly/2013Farm\\_RanchSurvey](http://bit.ly/2013Farm_RanchSurvey).

In 2013, U.S. farms irrigated 55.3 million acres, applying a total of 88.5 million acre-feet of water. The 229,237 farms that irrigated applied an average of 1.6 acre-feet of water. This is a decline since 2008, when 235,715 farms irrigated 55.5 million acres. Five states – Nebraska, California, Arkansas, Texas, and Idaho – together accounted for 52 percent of irrigated acres in 2013. The top ten states accounted for 71 percent.

Irrigation is used to provide water to both open fields and commodities protected by greenhouses or other structures. The 2013 Farm and Ranch Irrigation Survey collected data for both acres in the open and areas under protection. Acres in the open accounted for 99 percent of total water applied.

#### Top States in Irrigation (millions of acres)

Nebraska	8.3
California	7.5
Arkansas	5.0
Texas	4.5
Idaho	3.5
Kansas	2.9
Colorado	2.3
Montana	1.9
Mississippi	1.7
Washington	1.6

Source: USDA NASS, 2013 Farm and Ranch Irrigation Survey (2012 Census of Agriculture).

## Water Sources and Distribution

Producers relied on three water sources: ground water from wells, on-farm surface water, and off-farm water from a variety of sources. In 2013, producers applied 48.5 million acre-feet of ground water from wells to acres in the open, 55 percent of total water applied to these fields. (Table 1)

Sprinkler systems were the most widely used distribution method on open fields, used to irrigate 34.9 million acres, followed by systems that rely on gravity (21.5 million acres) and a variety of drip, trickle, or other low-flow micro systems (4.9 million acres).

Table 1  
Irrigation by Water Source, Acres in the Open, 2013

	Acres Irrigated	Acre-feet <sup>a</sup> Applied	
	millions	millions	%
Ground water from wells	37.2	48.5	55
On-farm surface water	6.4	9.2	10
Off-farm water	14.4	30.8	35
Total	--	88.5	100
Acres Irrigated	55.3 <sup>b</sup>		

<sup>a</sup>One acre-foot = 325,851 gallons. Covers one acre to a depth of one foot.

<sup>b</sup>Acres irrigated is less than the sum of individual sources because some irrigated acres have more than one water source.

Source: USDA NASS, 2013 Farm and Ranch Irrigation Survey (2012 Census of Agriculture).

## 475,796 Wells

U.S. producers used 475,796 wells in 2013 to irrigate open fields and pasture (acres in the open) and commodities grown in greenhouses and other structures (areas under protection). The wells provided 55 percent of water applied to acres in the open and 59 percent of water to protected areas. The average number of wells per farm was 3.9.

Sixty-five percent of wells had backflow prevention devices to prevent cross contamination of the well, and 28 percent had flow devices to measure the volume of water used. Wells had an average depth of 229 feet in 2013, and the average depth to water at the start of the irrigation season was 90 feet.

Source: USDA NASS, 2013 Farm and Ranch Irrigation Survey (2012 Census of Agriculture).

## Land Use

Cropland accounted for 95 percent of all irrigated land (52.6 million acres) and permanent pasture for 5 percent (2.7 million acres). The crops with the most land irrigated were (in millions of acres): corn for grain or seed (13.3), soybeans for beans (7.4), and alfalfa (5.5).

## Irrigation Expenses

Energy costs associated with pumping water on the farm (from both wells and surface water) are the largest category of irrigation expenses. In 2013, total U.S. energy costs of irrigation were \$2.7 billion, with electricity accounting for \$1.8 billion. The combined costs of equipment, facilities, land improvements, and computer technology were \$2.6 billion. (Table 2)

Producers spent \$521.9 million on water conservation efforts affecting 2.7 million acres and \$118.8 million on efforts to conserve energy on 927,091 acres.

Table 2  
Major Irrigation Expenses, 2013

	Total U.S. \$ billions	Avg. per Farm \$
Energy for pumping water (wells and surface)	2.7	17,238
<i>Of which: electricity</i>	1.8	14,251
Equipment, facilities, land improvement, computer technology	2.6	29,717
<i>Of which: new or replacement equipment</i>	1.9	23,505
Hired and contract labor	0.9	24,861

Source: USDA NASS, 2013 Farm and Ranch Irrigation Survey (2012 Census of Agriculture).

## Horticultural Operations

Horticultural operations irrigate acres in the open as well as areas under protection. In 2013, these operations irrigated 524,227 acres in open fields, 55,406 fewer than in 2008. Horticultural operations growing commodities under protection irrigated 1,405 million square feet in 2013, up from 1,369 million square feet in 2008. Floriculture and bedding crops accounted for more than half of irrigated acres under protection 2013 (Table 3).

Table 3  
Top Crops Irrigated by Horticultural Operations, 2013

	Area in the Open acres	Area under Protection millions of square feet
Sod	234,963	Floriculture and bedding crops 746.2
Nursery crops	202,121	Nursery crops 418.3
Christmas trees	38,395	Food crops 136.6
Floriculture and bedding crops	30,719	Propagative materials 68.7

Source: USDA NASS, 2013 Farm and Ranch Irrigation Survey (2012 Census of Agriculture).

## About the Census of Agriculture

The Census of Agriculture is the leading source of facts and figures about American agriculture. Data are available in multiple formats to help all users, professional and casual, find and use exactly what they need. Tools include:

- [Quick Stats 2.0](#) – an online database to retrieve customized tables
- A [new tutorial video](#) – easy-to-follow instructions for Quick Stats
- An [API for developers](#) - <http://quickstats.nass.usda.gov/tutorials>
- [Desktop Data Query Tool](#) – a downloadable desktop tool to analyze data without Internet access
- [Agricultural Atlas](#) – pattern and dot maps profiling many aspects of agriculture at the county level
- [Ag Census Web Maps](#) – a dynamic tool to download and analyze Census of Agriculture data in a geospatial context
- [Infographics](#) – fun, informative snippets of Census data and context
- [Highlights](#) – more documents like this one summarizing key facts on a topic

A link to census data is also available on USDA's open data portal, [www.usda.gov/data](http://www.usda.gov/data).

[www.agcensus.usda.gov](http://www.agcensus.usda.gov)