

# Farmland

## IN PERSPECTIVE

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### Midwest states in top 10 for U.S. agricultural exports

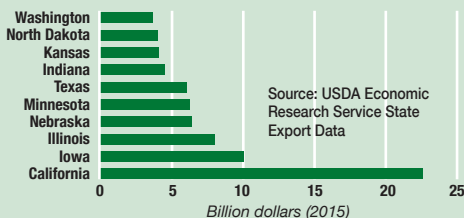
All U.S. states export some agricultural products to markets overseas. While the value of agricultural exports is relatively modest for states such as Alaska, Rhode Island, and New Hampshire (less than \$100 million in 2015), many states rely on agricultural exports for a large share of their market revenue.

The largest beneficiary of overseas markets is California, which contributes 17% of all U.S. agricultural exports by value. The \$23 billion worth of agricultural goods exported by California in 2015 is more than double the next largest state total, Iowa. Iowa and Illinois exported agricultural goods valued at \$10 billion and \$8 billion, respectively, in 2015.

To put these numbers in perspective, the 2012 Agricultural Census calculated the total value of agricultural sales in California to be \$44 billion, while Iowa and Illinois were valued at \$31 billion and \$17 billion, respectively.

In California, tree nuts account for the largest share of exports. Soybeans are the most valuable export in five of the top ten exporting states, including Iowa, Illinois, and Nebraska. Other leading export products for states in the top ten exporters include cotton, wheat, and fruits.

Top ten states for U.S. agricultural exports, by value



### How does the U.S. compete in global crop agriculture?

By Chad Hart, Extension Economist, Iowa State University

Crop agriculture is increasingly a global competition. Agricultural trade has expanded opportunities for crop producers both here in the U.S. and in international markets.

While the U.S. remains a strong player in most agricultural markets, technological and crop genetic breakthroughs have expanded the areas that can produce significant crops. This has led to increased competition in crop export markets, with that competition coming from a variety of sources.

The discussion below examines the big global players in corn, soybeans, cotton, and rice. Stealing a bit from David Letterman, I look at three "Top 10" lists – the 10 countries that have the most acreage devoted to the crop, the most production of the crop, and the most exports of that crop.

#### Corn

Let's begin our Top 10 tour with corn. It may surprise some to see that the U.S. does not have the largest number of harvested acres of corn. That distinction is held by China. During the past few years, China's corn area has exceeded that of the U.S. Brazil sits alone at #3, with 40 million acres. India and the European Union each have between 20 and 25 million acres of corn. Mexico harvested nearly 18 million acres of corn in 2016. Completing the Top 10 are two countries you might expect – Argentina and the Ukraine – and two that likely surprise – Tanzania and Nigeria. Corn production is on the upswing in Africa.

Switching to production, eight of these countries remain in the Top 10. Tanzania and Nigeria are replaced with Russia and South Africa. Yet, as the production figures show, global corn production is dominated by the U.S. This is due to our significant yield advantage. For the 2016 crop, the U.S. yield is estimated at 173 bushels per acre. The next closest competitor is Argentina with 129 bushels per acre, then the EU at 109 bushels per acre. China and Ukraine check in just below 100 bushels per acre each. India and Mexico both achieved yields below 60 bushels per acre.

While the U.S. is a strong leader in corn production, corn trade is becoming more competitive, especially given the focus on exports from South America and the Black Sea region. Roughly one-third of Brazil's corn crop is exported. Argentina exports nearly two-thirds of its crop. The same is true of the Ukraine.

*Continued on page 2*

While China and India are in the Top 10 for production, they also are major targets for corn exports, along with Japan and Mexico. (See Table 1)

### Soybeans

As with corn, global acreage in soybeans has two strong leaders. Brazil and the U.S. each harvest more than 80 million acres of soybeans. Argentina harvests nearly 50 million acres. In fact, South America has four countries in the Top 10, with Paraguay and Bolivia, adding up to more than 140 million acres. India and China each plant more than 15 million acres of soybeans. Canada, Russia, and Ukraine round out the Top 10.

The yield advantage the U.S. holds for corn is not nearly as dramatic for soybeans. For the 2016 crop, U.S. yields are estimated at 51 bushels per acre. Brazil and Argentina have yields between 44 and 45 bushels per acre. Canada is in the low 40s. Paraguay and Bolivia have yields in the high 30s. In fact, given acreage and yield trends in soybeans, Brazil will likely pass the U.S. as the top soybean producer in the next few years.

Brazil has passed the U.S. in the export market. South America is home to five of the Top 10 soybean exporters. (See Table 2)

### Cotton

In cotton, India is far and away the leader in harvested area. The U.S. is second. Central and Eastern Asia are well represented as China, Pakistan, Uzbekistan, and Turkmenistan appear on the list. While India has a sizable lead in acreage, production is a much closer race, as Chinese and U.S. yields are much higher. Brazil and Australia also are highly productive in cotton. The vast majority of the U.S. and Australian cotton crops are targeted for export, with China being the major market. Most of Africa's cotton production is destined for international markets as well. (See Table 3)

**Table 1. Global leaders in corn** (Source: USDA-FAS, PSD database, data for the 2016 crop year)

Rank		Acres Harvested (million)		Production (million bushels)		Exports (million bushels)
1	China	89.0	U.S.	15,058	U.S.	2,225
2	U.S.	86.8	China	8,504	Brazil	1,004
3	Brazil	40.5	Brazil	3,287	Argentina	984
4	India	23.5	EU	2,373	Ukraine	697
5	EU	21.8	Argentina	1,437	Russia	177
6	Mexico	17.5	Ukraine	1,024	Paraguay	91
7	Argentina	11.1	India	965	Serbia	87
8	Ukraine	10.5	Mexico	965	EU	67
9	Tanzania	10.4	Russia	551	South Africa	59
10	Nigeria	9.9	South Africa	512	Burma	37

**Table 2. Global leaders in soybeans** (Source: USDA-FAS, PSD database, data for the 2016 crop year)

Rank		Acres Harvested (million)		Production (million bushels)		Exports (million bushels)
1	Brazil	83.5	U.S.	4,268	Brazil	2,146
2	U.S.	83.0	Brazil	3,747	U.S.	2,025
3	Argentina	48.1	Argentina	2,094	Argentina	355
4	India	28.2	China	459	Paraguay	195
5	China	17.5	India	356	Canada	147
6	Paraguay	8.5	Paraguay	337	Uruguay	101
7	Canada	5.4	Canada	220	Ukraine	85
8	Russia	5.3	Ukraine	147	Russia	15
9	Ukraine	4.5	Bolivia	115	Bolivia	7
10	Bolivia	3.1	Uruguay	110	China	6

**Table 3. Global leaders in cotton** (Source: USDA-FAS, PSD database, data for the 2016 crop year)

Rank		Acres Harvested (million)		Production (million bales)		Exports (million bales)
1	India	26.6	India	26.5	U.S.	12.0
2	U.S.	9.7	China	21.0	Australia	3.9
3	China	6.9	U.S.	16.0	India	3.9
4	Pakistan	5.9	Pakistan	8.3	Brazil	2.9
5	Uzbekistan	3.1	Brazil	6.5	Uzbekistan	2.2
6	Brazil	2.3	Australia	4.0	Burkina	1.3
7	Burkina	1.7	Uzbekistan	3.7	Mali	1.2
8	Mali	1.7	Turkey	3.2	Turkmenistan	0.9
9	Turkmenistan	1.3	Turkmenistan	1.5	Greece	0.8
10	Australia	1.2	Burkina	1.3	Benin	0.7

**Table 4. Global leaders in rice** (Source: USDA-FAS, PSD database, data for the 2016 crop year)

Rank		Acres Harvested (million)		Production (billion pounds)		Exports (billion pounds)
1	India	110.0	China	323.0	India	22.0
2	China	74.9	India	234.8	Thailand	20.9
3	Indonesia	30.0	Indonesia	80.7	Vietnam	12.8
4	Bangladesh	28.9	Bangladesh	76.1	Pakistan	9.3
5	Thailand	24.9	Vietnam	61.3	U.S.	7.8
6	Vietnam	19.0	Thailand	41.0	Burma	3.7
7	Burma	17.3	Burma	27.6	Cambodia	2.3
8	Philippines	11.7	Philippines	26.5	Uruguay	1.9
9	Cambodia	7.4	Brazil	17.7	Brazil	1.4
10	Pakistan	6.9	Japan	16.9	Argentina	1.2

## Rice

With rice, it is not surprising that the Top 10 lists are loaded by countries from Southeast Asia. India and China lead the charge. The U.S. ranks 18th in rice area with 3.1 million acres. However, for most of Southeast Asia, rice yields range from 1,500 to 3,000 pounds per acre. China's 2016 yield was 4,310 pounds per acre, enough to easily make China the largest rice producer. U.S. yields, for comparison, are estimated at 5,270 pounds per acre for the 2016 crop. That's high enough to place the U.S. as the 11th largest rice producer, with 16.5 billion pounds. India and Thailand are the largest exporters. The U.S. ranks 5th in rice exports. A trio of South American countries finish out the Top 10 rice exporters. (See Table 4)

## Highlights

The lists highlight several key features about the global crop market. First, the U.S. remains a strong participant in global crop agriculture. Second, acreage doesn't always translate to production and large production doesn't necessarily lead to exports. Third, crop markets depend on production from around the globe, not just from a few key places. Fourth, international markets are crucial to the growth of crop agriculture. As the lists show, it is not uncommon for countries, including the U.S., to produce significant crops directly targeted for trade and not for internal use.



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the Food and Agricultural Policy Research Institute (FAPRI) and the Center of Agricultural and Rural Development (CARD) at Iowa State University.

Dr. Hart received a B.S. in economics with minors in mathematics, history, and astronomy from Southwest Missouri State University in 1991. He received his Ph.D. in economics and statistics from Iowa State University in 1999.

Dr. Hart grew up on a rural homestead near Stark City in southwest Missouri.

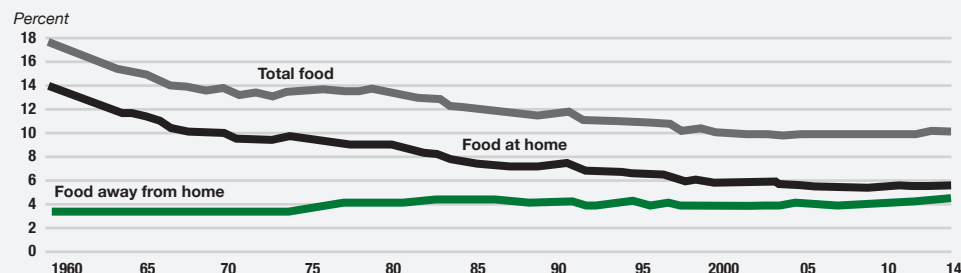
## Average share of income spent on total food in U.S. remains relatively constant

In 2014, Americans spent an average of 9.7% of their disposable personal incomes (DPI) on food. After falling from 17.0% in 1960 to 10.0% in 1999, the share of DPI spent on total food by the average American has remained between 9.5% and 9.8% since 2000.

The share of DPI spent on food away from home (food purchased from restaurants, fast food places, schools, and other food-away-from-home eating places) was 3.9% in 2000, 4.1% in 2005 and, after flattening out during the 2007-09 recession through 2012, reached 4.3% in 2014.

In contrast, the share of DPI spent on food at home (food purchased from supermarkets, convenience stores, warehouse club stores, supercenters, and other retailers) declined from 5.8% percent in 2000 to 5.5% in 2014.

### Percent of per capita disposable income spent on food in the United States, 1960–2014



Source: USDA, Economic Research Service, Food Expenditure Series.

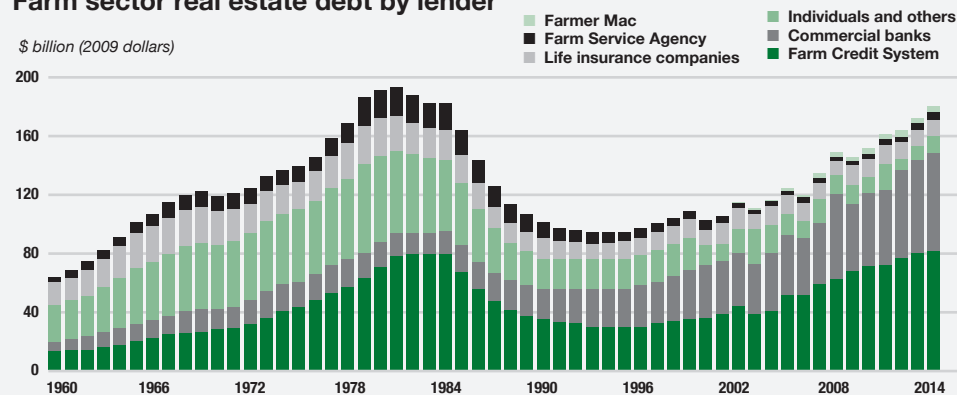
## Farm sector real estate debt trends vary by lender

Since the late 1970s, the Farm Credit System (FCS) has been the largest U.S. lender to the farm sector for loans secured by real estate, according to the U.S. Department of Agriculture. The trend in outstanding real estate debt held by FCS closely tracks the overall sector real estate debt trend. Debt held by FCS peaked in the early 1980s and then declined for the next decade before increasing to an inflation-adjusted high of \$81.7 billion in 2014.

Prior to the 1990s, commercial banks held substantially less debt than the FCS. However, farm sector real estate debt held by commercial banks has increased sharply since the 1990s, leading commercial banks to become the second most prominent farm real estate lender.

Farmer Mac, though small relative to FCS and commercial banks, has also shown growth in real estate debt outstanding during the period. While the real estate debt outstanding at FCS, commercial banks, and Farmer Mac has grown sharply since the 1990s, the trend has held relatively flat or declined modestly for the other lenders in that period, according to the USDA.

### Farm sector real estate debt by lender



Note: The gross domestic product (GDP) chain-type price index is used to convert nominal estimates to real (inflation-adjusted) amounts (2009=100). Beginning in 2012, farm sector debt held by savings associations is reported with commercial banks instead of individuals/others. Farmer Mac data are included beginning in 2002. Storage facility loans, identified separately in the underlying data, are combined with Farm Service Agency data to simplify the graph shown here.

Source: USDA, Economic Research Service, Farm Income and Wealth Statistics, data as of February 9, 2016.

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