



*Photo courtesy of Aaron Greuel.*

# Economic Impact of the 2012 Drought

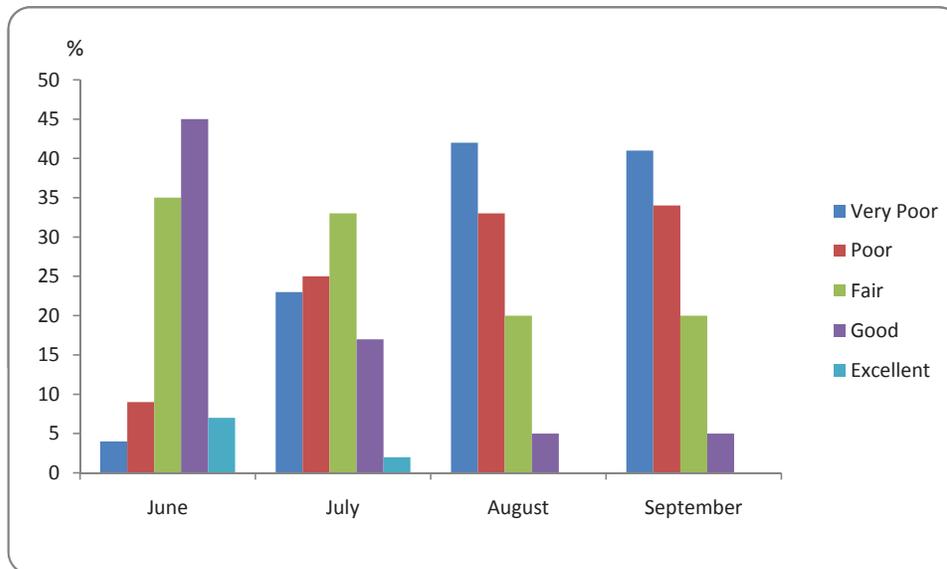
*by Dave Bieneman, Ph.D.*

**T**he excessive heat and drought of 2012 affected much of the United States, retarding the growth of many agricultural crops in Illinois and the Midwest. The U.S. is the world's largest exporter of corn, soybeans and wheat. The crops with the highest proportion of production share in Illinois and the states around it are corn and soybeans. These two crops are very important to the world economy, and the region produces a significant proportion of the world's total harvest.

## Summer Crop Conditions

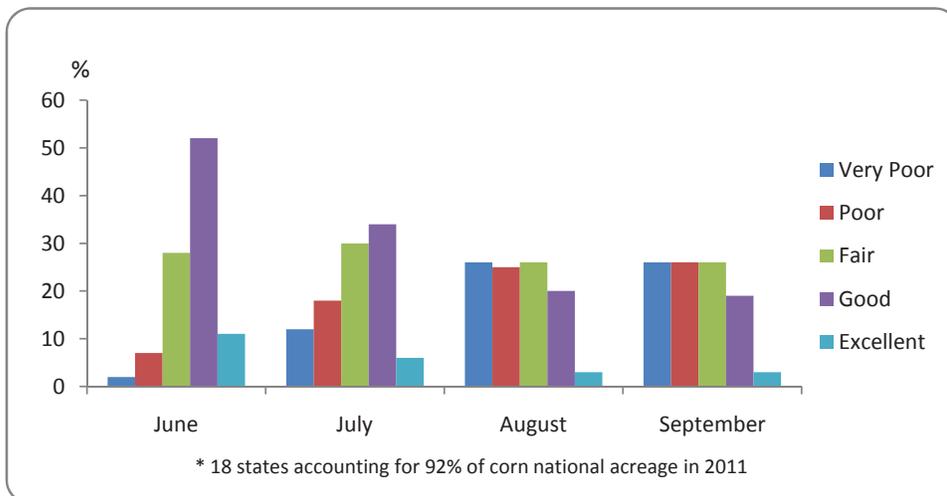
Data from the U.S. Department of Agriculture's National Agricultural Statistics Service shows that crop conditions for corn in the state of Illinois deteriorated rapidly during the summer of 2012 and were either "very poor" or "poor" for about 80 percent of the crop in July and August (see Exhibit 1 on next page). The critical pollination stage for corn growth is around mid-summer, and it is clear that the conditions to produce a

## Exhibit 1. Corn Crop Conditions - Illinois (2012)



Source: USDA National Agricultural Statistics Service

## Exhibit 2. Corn Crop Conditions - 18 States\* (2012)



Source: USDA National Agricultural Statistics Service

successful corn harvest in Illinois were far from ideal.

Data for the 2012 conditions in the major corn growing states (18

states that planted 92 percent of the acreage for corn in 2011) is shown in Exhibit 2. This chart shows that the conditions overall were not quite as bad as those in Illinois but

still skewed toward less than fair conditions. The list of 18 states includes all of the Midwestern states.

By August of 2012, the warm, sunny weather promoted faster than typical development, and much of the nation's corn crop had moved beyond the point in time that rain would have helped it grow to its potential. Early-month precipitation in some areas helped fields that were planted late but did little to aid corn that had already matured. As of July 25, the number of areas designated for disaster aid totaled 1,369 counties in 31 states. Two-thirds of the United States was in mild or extreme drought.<sup>1</sup> Conditions were so bad that some producers chose to chop the corn for silage or bale it for hay to use as livestock feed.<sup>2</sup>

Although the conditions for soybeans in Illinois were also bad in 2012, Exhibit 3 (*on next page*) shows they were not as bad as they were for corn. One big difference between the two crops is that soybeans are planted later than corn and their pods develop at a later date than when the pollination process occurs in corn. Cooler temperatures and moisture starting around Labor Day weekend (via remnants of Hurricane Isaac) helped to relieve some of the stress on the soybean harvest.

The difference between the conditions in Illinois and the major soybean growing states [18 states that planted 96

1. Peter Bohan and Russ Blinch Reuters, "US Midwest Drought Worsens, Food Inflation to Rise," Jakarta Globe, (July 26, 2012), [http://www.thejakartaglobe.com/economy/us-midwest-drought-worsens-food-inflation-to-rise/532808#Scene\\_1](http://www.thejakartaglobe.com/economy/us-midwest-drought-worsens-food-inflation-to-rise/532808#Scene_1).

2. USDA Crop Production Report, National Agricultural Statistics Service, Agricultural Statistics Board (September 12, 2012), <http://usda01.library.cornell.edu/usda/nass/CropProd//2010s/2012/CropProd-09-12-2012.pdf>.

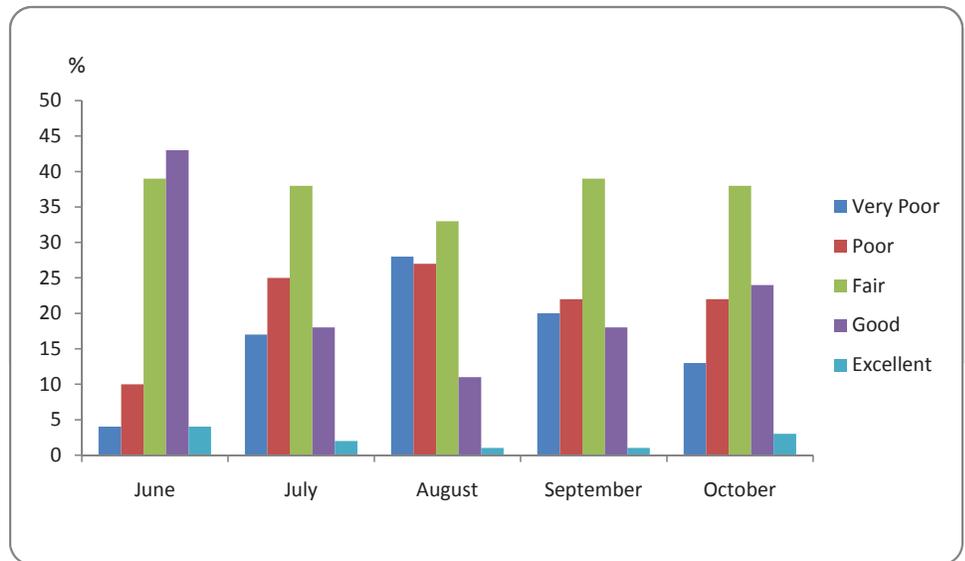
percent of the acreage for soybeans in 2011 (Exhibit 4)] was not as significant as it was for corn. Again the late rains and cooler temperatures helped to salvage the soybean crop in Illinois. The list of 18 states includes all of the Midwestern states.

The 2012 drought was the most severe and extensive in about 25 years and had a serious impact on U.S. agriculture. The corn harvest is now nearly complete, with 95 percent of the crop harvested as of Nov. 4. Corn yields (bushels per acre) are the lowest since 1995. Corn production for the nation in 2012 is now estimated at 10.7 billion bushels, down from early season projections of 14.8 billion (about a 28 percent decline). Meanwhile, the latest soybean yield forecast is 39.3 bushels per acre (lowest yields since 2003), down from the initial forecast of 43.9 bushels per acre (a little more than 10 percent decline).<sup>3</sup>

## Economic Impact

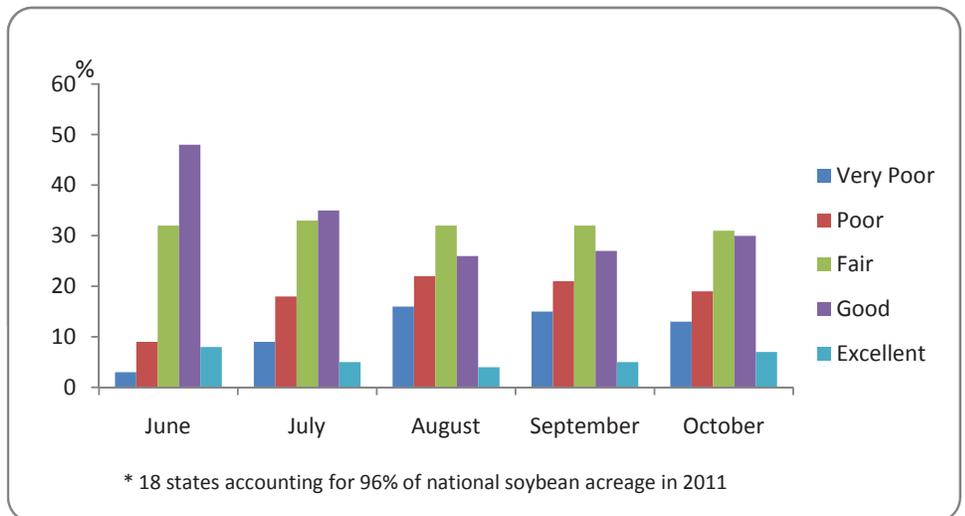
The 2012 summer drought could become the second most expensive weather event ever, behind only Hurricane Katrina.<sup>4</sup> It caused a general decline in farm incomes and will have an inflationary effect on grocery prices for the next few years. U.S. food prices were expected to rise 3.5 percent in 2012 (*final data pending*). A 3 to 4 percent increase is projected for 2013. The rise in farm prices will not have the same negative impact on consumer inflation (overall prices) that a similar

**Exhibit 3. Soybean Crop Conditions - Illinois (2012)**



Source: USDA National Agricultural Statistics Service

**Exhibit 4. Soybean Crop Conditions - 18 States\* (2012)**



Source: USDA National Agricultural Statistics Service

gain in the price of oil would have had.<sup>5</sup> Those price increases will likely raise the overall price level represented by the Consumer Price Index by around 0.3 percent. That is because most of the

food purchased in developed nations has been processed to some degree, and so the final price of the good includes this and other factors such as marketing and distribution.

3. "U.S. Drought 2012: Farm and Food Impacts," U.S. Department of Agriculture - Economic Research Service (November 28, 2012), <http://www.ers.usda.gov/topics/in-the-news/us-drought-2012-farm-and-food-impacts.aspx>.

4. Richard Gootee, "Inflationary effect of drought on food prices to be felt for years," Evansville Courier & Press (September 14, 2012), <http://www.courierpress.com/news/2012/sep/14/no-headline---farming/>.

In the U.S. corn and soybeans are mainly consumed by livestock as well as the processed foods and biofuels industries. Because feed costs have forced livestock farmers to adjust, there will be less beef, pork, chicken and turkey late in 2013 and then into 2014, which means higher prices for those items. Sweet corn, eaten by humans, is distinct from the field corn used for feed and has not been seriously impacted at this point.

Other countries depend on imports of grain from the Midwestern states, as the U.S. typically grows 35 percent of the world's corn and soybean crops.<sup>6</sup> The U.S. is the leader in agricultural commodity exports, and the Midwest is the greatest producer of these commodities. Since food makes up a larger share of inflation in emerging economies, it could have a bigger impact on overall inflation, forcing labor costs higher and increasing the cost of imports.

Demand for these commodities remains strong in the developing world even as the global economy has slowed. Officials fear panic buying by importers and export restrictions that would make the problem larger. The situation could result in a repeat of



the severe shortfall in 2008 that saw food riots in some countries.<sup>7</sup>

Increasing prices in 2011 for basic food items such as rice, cereals, cooking oil and sugar triggered political unrest in Tunisia, Yemen, Egypt and other countries.<sup>8</sup>

A related issue of importance to the Midwestern states is that some pressure has been brought to waive the national Renewable Fuel Standard in order to divert corn and other crops from biofuel production and dedicate them to animal feed.<sup>9</sup> Co-products such as

dried distillers grains with solubles, corn gluten feed and corn gluten meal are produced in the ethanol production process. If these co-products were short in supply, then that would also raise the price of animal feed. In fact every bushel of corn that is processed by an ethanol plant produces 2.7 to 2.8 gallons of ethanol and about 16 to 17 pounds of animal feed.

Similarly, biodiesel production from soybeans yields the co-product of soybean meal. So a waiver for Renewable Fuel Standard would not

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5. Kathleen Madigan, "Rising Farm Prices Don't Pack Inflation Punch of Oil," Wall Street Journal (July 24, 2012), <http://blogs.wsj.com/economics/2012/07/24/rising-farm-prices-dont-pack-inflation-punch-of-oil/>.

6. Gregory Meyer, "US drought: Stuck on dry land," Financial Times (July 30, 2012), <http://www.ft.com/intl/cms/s/0/2866ba4a-da40-11e1-b03b-00144feab49a.html>.

7. John W. Schoen, "Grain prices soar as drought impact deepens," NBCNews.com (August 10, 2012), [http://economywatch.nbcnews.com/\\_news/2012/08/10/13219551-grain-prices-soar-as-drought-impact-deepens?lite](http://economywatch.nbcnews.com/_news/2012/08/10/13219551-grain-prices-soar-as-drought-impact-deepens?lite).

8. Marilyn Geewax, "Pray For Rain: Food Prices Heading Higher," National Public Radio (July 25, 2012), <http://www.npr.org/2012/07/25/157353649/pray-for-rain-food-prices-heading-higher>.

9. "Study: Waiving RFS Could Increase Feed Costs for Livestock, Poultry Producers," Renewable Fuels Association News Release (October 12, 2012), <http://www.ethanolrfa.org/news/entry/study-waiving-rfs-could-increase-feed-costs-for-livestock-poultry-producers/>.

necessarily lower costs of animal feed for farmers, as dried distillers grains with solubles are now 20 to 50 percent of the feed provided to livestock and poultry.

Research results on the impact of ethanol production on gasoline prices indicate that the growth in ethanol production reduced wholesale gasoline prices by \$0.29 per gallon across all regions of the nation, on average, for the period from January 2000 to December 2011.<sup>10</sup> The Midwest region experienced the biggest price reduction of \$0.45 per gallon. According to 2011 data, the average effect across all regions increases to \$1.09 per gallon nationwide and to \$1.69 per gallon for the Midwest. The 2011 numbers reflect increasing ethanol production and higher crude oil prices.

However, price increases for the inputs of corn and soybeans meant lower margins for ethanol refineries and biodiesel plants in 2012. Ethanol producers in particular may have to find additional revenue streams to remain profitable in periods of high corn prices. With corn and bean prices high, livestock producer margins will decline the more that those prices rise. More livestock will be slaughtered if feed is priced high or feed is not available. So short-term meat industry employment is expected to increase, but it is expected to decrease in the longer term.

The relatively small harvest would also have a negative impact on the seed supply for 2013 because of increased costs and less production. The drought will impact the moisture in the subsoil in the spring, so next year's crop conditions have already been adversely affected.<sup>11</sup>

Seed varieties that have been improved to make them more drought tolerant have shown better yields from 5 to 15 percent in low-water conditions.<sup>12</sup> However these seeds can cost about \$10 more per acre; so farmers must determine if the extra cost can be justified before planting. Other practices, such as increasing organic matter in the soil, can help the ground retain moisture. This form of drought mitigation can be

The 2012 drought... caused a general decline in farm incomes and will have an inflationary impact on grocery prices for the next few years.



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10. Xiaodong Du and Dermot J. Hayes, "The Impact of Ethanol Production on U.S. and Regional Gasoline Markets: An Update to 2012," Working Paper 12-WP 528, Center for Agricultural and Rural Development, Iowa State University (May 2012), <http://www.card.iastate.edu/publications/dbs/pdffiles/12wp528.pdf>.

11. "Drought Impacts Beyond Crops, Livestock," *Corn & Soybean Digest* (September 19, 2012), <http://cornandsoybeandigest.com/issues/drought-impacts-beyond-crops-livestock>.

12. Heidi Marttila-Losure, "New corn varieties promise better yields in drought conditions," *Dakotafire* (October 29, 2012), <http://dakotafire.net/newspapers/new-corn-varieties-promise-better-yields-in-drought-conditions/2499/>.

accomplished through reducing tillage, diversifying crop rotations and using cover crops.

Low water levels may impact the tourism and recreation industry as well as stifle commercial barge traffic, increasing operational costs and lowering revenues. The drought has caused the Mississippi River level to be at its lowest level in decades, and it could drop to a historic low level of 6.4 feet in St. Louis by early January 2013. This has further exposed issues associated with commercial water transportation. Farmers and agribusiness leaders believe the federal government has not maintained the infrastructure of locks and dams on the river and now are asking that the Army Corps of Engineers work to maintain the navigability of certain sections of the river.

Estimates show that \$52 billion in grain and other agricultural

goods is produced annually within the Mississippi River watershed. Approximately 125 million tons of commodities were shipped via the upper basin of the river in 2008, according to a study commissioned by the Waterways Council. The study estimates that 7,500 jobs could be lost in Illinois and Missouri due to the existing problems with river transportation.<sup>13</sup>

Other industries involving the production and maintenance of trees, plants and flowers have suffered. Water supplies have been stressed, making maintenance of lawns and gardens difficult and causing negative impacts on fish and other wildlife. The insurance industry has been impacted due to the increase in claims that need to be paid by those companies.<sup>14</sup>

## Summary

The 2012 drought was the most severe and extensive in about 25 years and had

a serious impact on U.S. agriculture. Because of the timing of precipitation late in the summer, the corn crop was impacted more by the drought than was the soybean crop. It had a direct impact on farm incomes and will have an inflationary effect on grocery prices that are expected to rise 3.5 percent this year and 3 to 4 percent in 2013. Inflation overall is expected to increase around 0.3 percent.

Other countries depend on imports of grain from the Midwestern states, as the United States typically grows 35 percent of the world's corn and soybean crops. Since food makes up a larger share of inflation in emerging economies, it could have a bigger impact on the overall inflation in those countries and could even impact the political situation in some countries.

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13. Georgina Gustin, "Fixing the Mississippi's infrastructure critical to farm economy," St. Louis Post-Dispatch (December 12, 2012), [http://www.stltoday.com/business/local/fixing-the-mississippi-s-infrastructure-critical-to-farm-economy/article\\_9eb0d14e-a047-569e-b7a9-5d150d10cc19.html](http://www.stltoday.com/business/local/fixing-the-mississippi-s-infrastructure-critical-to-farm-economy/article_9eb0d14e-a047-569e-b7a9-5d150d10cc19.html).

14. Stu Ellis, "How will the drought impact you?", Drovers Cattle Network (September 18, 2012), <http://www.cattlenetwork.com/cattle-news/latest/How-will-the-drought-impact-you-170160176.html>.



## *Economic Impact of the 2012 Drought*

- Deteriorated crop conditions for corn and beans in U.S. (*Illinois worse than overall average*)
- Higher livestock feed costs caused by higher commodity prices for corn and beans
- Decreased incomes in general for U.S. farmers
- A projected rise in U.S. food prices of 3.5 percent in 2012 (*final data pending*) and 3 to 4 percent in 2013
- 2013-14 shortage in U.S. beef, pork, chicken and turkey
- Higher U.S. prices for beef, pork, chicken and turkey