United States Department of Agriculture

Economic Research Service

U.S. Drought 2012: Farm and Food Impacts

The most severe and extensive drought in at least 25 years seriously affected U.S. agriculture, with impacts on the crop and livestock sectors and with the potential to affect food prices at the retail level. Below is information on impacts of the drought on key commodities and food prices.

Food Prices and Consumers

Farms

Crop Sectors

Livestock Sectors

Current USDA estimates of weather impacts on the farm sector are still reflected in the monthly World Agricultural Supply and Demand Estimates (WASDE) report and the Crop Production report. USDA's National Agricultural Statistics Service (NASS) released final estimates of the 2012 production of crops in January 2013. ERS's February 11, 2013 farm income forecast reflected information in the January 2013 WASDE report, and the forecast will be updated in August. Looking ahead, the 2013 impacts of weather depend on precipitation patterns from spring through early fall, and on the response of producers and markets to weather conditions and yields. NASS has released the 2013 report on farmers' Prospective Plantings.

Food Prices and Consumers

The 2012 drought destroyed or damaged portions of the major field crops in the Midwest, particularly field corn and soybeans. This led to increases in the farm prices of corn, soybeans, and other field crops and, in turn, led to price increases for other inputs in the food supply such as animal feed. Though we saw some price increases for meats and animal-based products in the fourth quarter of 2012, most of the impacts on retail food prices were expected to occur in 2013.

It is now clear that the impact of the drought on retail food prices will be smaller than initially forecast. The inflationary pressure of the drought has been offset by factors such as decreased exports of many U.S. agricultural products, a stronger U.S. dollar, low energy price inflation, and decreased prices for many commodities not affected by the drought.

Retail food prices decreased slightly, on average, for the first six months of 2013. The food-at-home CPI is now on track to increase 1.5 to 2.5 percent over 2012 levels, reflecting lower-than-average annual inflation.

The largest price impacts of the drought have occurred for poultry and egg prices. Between June 2012 and June 2013, poultry prices rose 5.5 percent and egg prices rose 6.9 percent.

The impact of high feed prices on retail beef prices was small, in percentage terms, because many beef prices had already attained record highs before the effects of the drought were realized. Cattle inventories remain at or near-historic lows, continuing the trend of structural inflation for this category. The impact of the drought on pork prices was more than offset by increased hog inventories and sharply decreased pork exports.

The majority of the drought impact on dairy prices took place in the final quarter of 2012. Increased milk production has offset further drought-induced inflation in 2013, and therefore the dairy CPI is expected to increase only modestly in 2013.

The full effects of the increase in corn prices for packaged and processed foods (cereal, corn flour, etc.) can take as long as 10-12 months to move through to retail food prices. Therefore there is still the potential for a surge in prices for selected CPI categories such a bread and cereal products or other foods.

Commodity prices are just one of many factors affecting retail food prices. Historically, if the farm price of corn increases 50 percent, then retail food prices as measured by the Bureau of Labor Statistics (BLS) in the Consumer Price Index (CPI) increase by 0.5 to 1 percent. Commodities make up less than 15 percent of the average value of retail food purchases, so even if all commodity prices doubled, retail food prices would increase by no more than 15 percent. The 2012 drought has served as a further illustration of the weak correlation between farm prices and retail prices.

Sweet corn, eaten by humans, is distinct from field corn (used for feed) and is not being heavily affected by adverse weather at this point.

Monthly updates to ERS's food CPI forecast provide the forecast for 2013 and for 2014 and incorporate information available on drought impacts at the time of writing.

Listen to the USDA Radio interview with Richard Volpe, ERS Consumer Price Index analyst.

Farms

About 80 percent of agricultural land experiened drought in 2012, which made the 2012 drought more extensive than any since the 1950s. USDA's monthly World Agricultural Supply and Demand Estimates (WASDE) report reflects current estimates of weather impacts. The National Agricultural Statistics Service (NASS) released final estimates of the 2012 production of crops in January 2013. ERS's February 11, 2013 farm income forecast reflected information in the January 2013 WASDE report, and the forecast will be updated in August. The impacts of weather on 2013 farm income depend on precipitation patterns from spring through early fall, and on the response of producers and markets to weather conditions and yields. NASS has released the 2013 report on farmers' Prospective Plantings.

Highlights

The 2012 drought rapidly increased in severity from June to July and persisted into August. As of September 12, over 2,000 U.S. counties had been designated as disaster areas by USDA in 2012, mainly due to drought.

As of August 14, 60 percent of farms were located in areas experiencing drought. By mid-August, the impacts of the drought would have been fully realized for the majority of field crops.

Based on the 2011 value of production, at least 70 percent of both crop production and livestock production was in areas experiencing at least moderate drought as of August 14.

Severe or greater drought in 2012 impacted 67 percent of cattle production, and about 70-75 percent of corn and soybean production.

More than 80 percent of the acres of major field crops planted in the United States are covered by Federal crop insurance, which can help to mitigate yield or revenue losses for covered farms.

Details

As of mid-August 2012, 60 percent of farms in the United States were experiencing drought. About 17 percent of farms were in counties where most of the land is under moderate drought; 15 percent of farms were experiencing severe drought; and 28 percent were experiencing extreme or exceptional drought.

A striking aspect of the 2012 drought is how the drought rapidly increased in severity in early July, during a critical time of crop development for corn and other commodities. The table shows the progression from mid-June to mid-August of severe or greater drought within the agricultural sector. While there was some easing of drought conditions during early September, for most crop production the exposure to drought during the June to August period will determine drought impacts. From mid-June to mid-August, the share of farms under severe or greater drought increased from 16 percent of all farms to 43 percent. Total cropland under severe or greater drought increased from 20 percent to 57 percent, while total value of crops exposed increased from 16 to 50 percent.

Farm Sector Exposure to Drought, Summer 2012

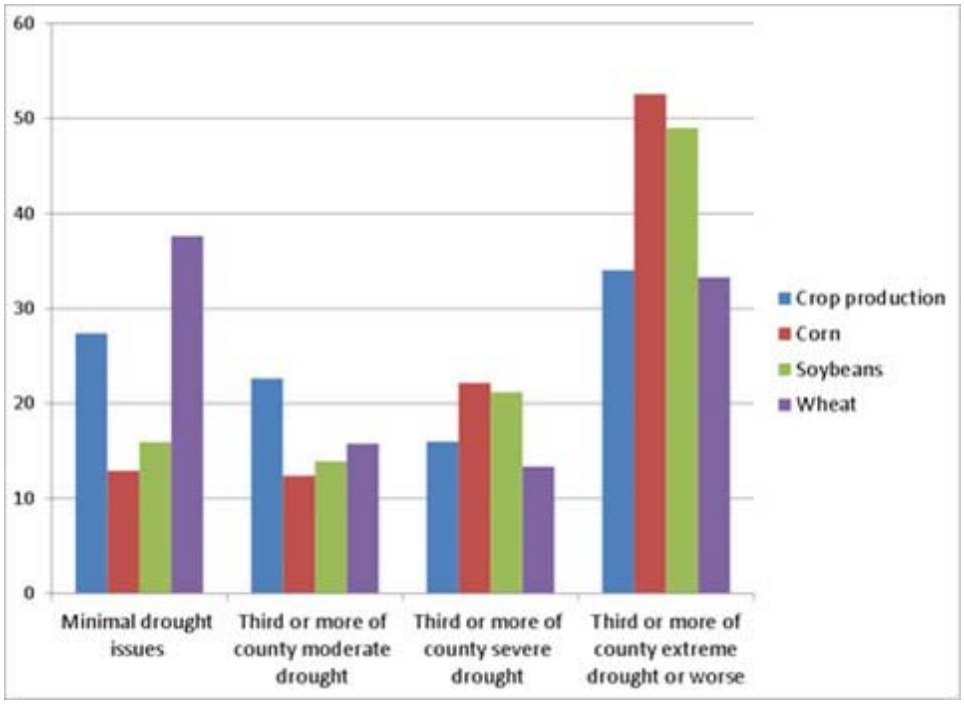
Percentage experiencing severe or greater drought			
Percentage of:	**June 19**	**July 17**	**August 14**
Farms	16	40	43
Acres of Cropland	20	51	57
Value of Crops	16	43	50
Value of Cattle	21	56	67

Values are percentage of national total.
Source: ERS calculations based on 2011 data from the Agricultural Resource Management Survey (ARMS) and county-level U.S. Drought Monitor data reflecting drought status as of August 14, 2012.

Exposure to drought in 2012 varied by commodity. Figure 1 shows the distribution of drought severity for major crops, in value terms.

21-22 percent of the value of corn and soybean production was in areas with severe drought in 2012, while 49-53 percent of the value of production was in areas currently experiencing extreme drought or worse.

Figure 1: Share of National Value of Crop Production by 2012 Drought Severity



Download larger size chart (481 pixels by 350 pixels, 96 dpi)

Source: 2011 ARMS; U.S. Drought Monitor (August 14, 2012 drought status). Drought status is designated by the highest level of drought affecting at least 1/3 of a county.

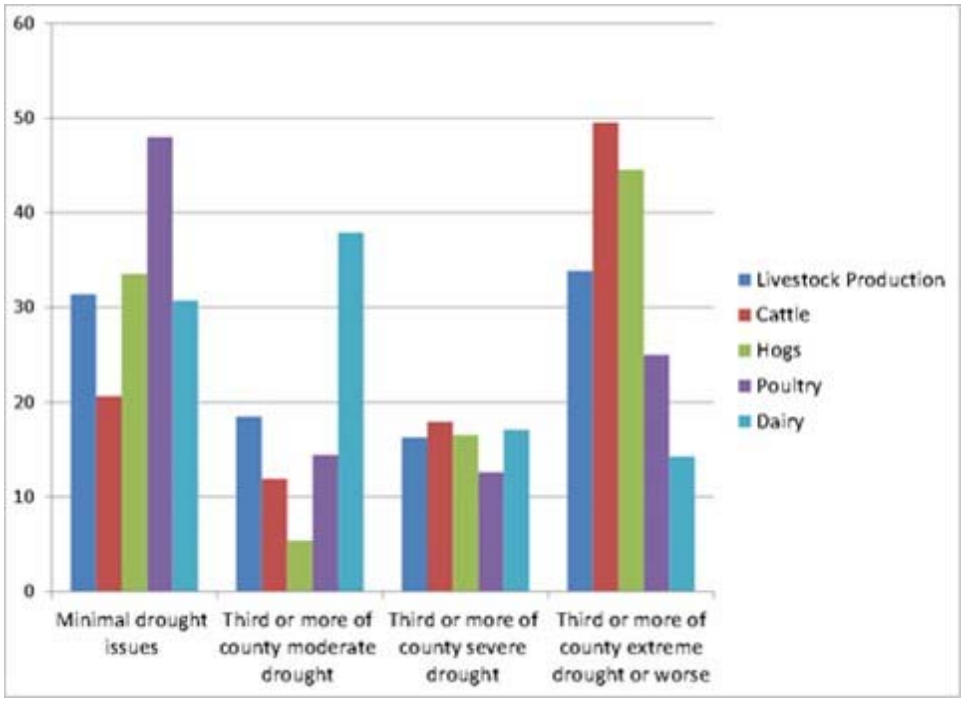
Figure 2 shows the distribution of drought severity in 2012 by livestock type, in value terms.

31 percent of all livestock produced (by value) was in areas with minimal drought, 18 percent in areas with moderate drought, and about half in areas with severe or worse drought.

Poultry farms were the least likely to be in areas affected by drought, while 78 percent of cattle production (value) was in areas with moderate or greater drought. However, livestock operations throughout the country were indirectly impacted by the drought through increased feed costs.

12 percent of cattle were produced in areas with moderate drought, and 67 percent in areas with at least severe drought.

Figure 2: Share of National Value of Livestock Production by 2012 Drought Severity



Download larger size chart (481 pixels by 349 pixels, 96 dpi)

Source: 2011 ARMS; U.S. Drought Monitor (August 14, 2012 drought status). Drought status is designated by the highest level of drought affecting at least 1/3 of a county.

Crop Sectors

Once the 2012 harvest of most field crops was nearly complete, the severity of the drought and its effect on crop production became better understood. Production estimates for coarse grains and oilseeds were raised slightly from the previous month in the November World Agricultural Supply and Demand Estimates (WASDE) report, but yields and production of many field crops, particularly corn and soybeans, remained far below levels that would have been expected under more normal growing conditions. What had started out as a promising year for U.S. crop production, with favorable planting conditions supporting high planted acreage and expectations of record or near-record production, saw some of the driest and most unfavorable growing conditions in decades.

Crop production estimates for several major crops declined throughout the summer as the drought intensified, and by November, USDA's National Agricultural Statistics Service (NASS) production estimates for corn were down 27.5 percent from those reported in May 2012, while production estimates for soybeans fell 7 percent over the same period. These declines reflect sizeable reductions in crop yields per harvested acre as well as smaller-than-normal harvested shares of planted cropland. Sorghum production estimates also declined significantly - 24 percent - between May and November, but 2012 production levels were expected to exceed 2011 levels by nearly 20 percent, reflecting higher total acreage and lower abandonment despite yields projected 6 percent below last year. Production estimates released with the November WASDE report show modest changes for feed grains compared with the previous month, with corn production up 19 million bushels and sorghum up 4 million bushels from the October estimates.

The 2012 production declines from expectations early in the growing season reflected crop condition ratings that declined throughout much of the growing season. In the first weekly rating of the corn crop reported by NASS on May 2012, over 75 percent had been rated as good to excellent, while only 3 percent was in the poor or very poor category. By September 30, 2012, only 25 percent of the crop was rated good to excellent with 50 percent rated poor or very poor. Sharp declines in soybean crop ratings also occurred, with only 35 percent of the crop rated good to excellent as of October 7, compared with 65 percent in the year's first weekly soybean rating on June 3.

Production of corn and soybeans, as well as other crops, was particularly critical for supply, demand, and

price conditions during the 2012/13 marketing year because of relatively tight U.S. and global stocks positions at the end of the 2011/12 marketing year. Instead of building during the new marketing year, stocks of corn and soybeans would remain low, with reductions in all major use categories required to balance demand with supply.

Due to the tighter-than-expected supplies, prices for many of the crops affected by the drought reached record or near-record levels during the summer months leading up to the 2012 harvest, and remain at historically high levels. Marketing-year average prices for 2012/13 (September 2012 through August 2013) were forecast in the June 2013 WASDE report to fall within a range of $6.75-$7.15 per bushel for corn, with soybeans forecast at $14.30 per bushel. Marketing-year average prices in these ranges would be record highs in nominal terms.

Corn

After sharp reductions in 2012 corn yield and production forecasts in July and August, only small additional reductions were made in the September, October, and November USDA assessments. The November WASDE reported a modest (0.3 bushel/acre) increase in expected 2012 corn yields, resulting in a forecast production nearly identical to the one reported in September. Initial expectations at planting time had suggested yields averaging a record 166 bushels per acre, but deteriorating growing conditions throughout the summer led USDA to reduce yield expectations by 20 bushels per acre in July, by an additional 22.6 bushels per acre on August 10, by another 0.6 bushels per acre on September 12, and another 0.8 bushels on October 11 before the 0.3 bushel increase reported in November. The final 2012 yield estimate was set at 123.4 bushels per acre, the lowest since 1995.

The final U.S. 2012 corn production estimate came in at 10.78 billion bushels, down sharply from early-season projections of 14.8 billion, but only slightly below early August projections of 10.8 billion.

Season-average corn prices for the 2012/13 marketing year were forecast in the June 2013 WASDE report to fall within a range of $6.75-$7.15 per bushel, up from the average of $6.22 for 2011/12. Marketing-year corn prices in this range would be record high in nominal terms.

Ending stocks for 2012/13 were projected in the June 2013 WASDE report at 769 million bushels, higher than early estimates of below 650 million, but still the lowest since 1995/96, when ending stocks were 426 million bushels.

See current ERS Feed Outlook and data on production, use, yield, and prices.

Soybeans

A significant amount of soybean acreage was also in the drought-affected region. After a large reduction in estimated 2012 soybean yields in August and a small additional reduction in the September USDA assessment, estimates for October and November were raised as late-season rainfall improved yield prospects in many States. The final 2012 yield estimate stands at 39.6 bushels per acre, well below forecasts at the beginning of the season of 43.9 bushels per acre but about 10 percent above the September 2012 forecast. Soybean yields in 2012 were the lowest since 2003.

Soybean supplies were extremely tight entering the 2012 harvest, pushing soybean prices to record highs during parts of the summer and early fall. As the outlook for supplies improved due to late-season rainfall in some regions, prices trended lower. Season-average prices for 2012 were forecast at $14.30 per bushel in the 2013 WASDE report, still high by historic standards but well below the September forecast of $15-$17 when much lower supplies were expected. Even with improved yields, ending stocks from the 2012 harvest are still forecast to be tight at 140 million bushels, the lowest level of carryover stocks since 2003/04.

Prices for soybean products have recently been trending lower along with the price of soybeans. For 2012/13, soybean oil prices are expected to average 48.5 cents per pound, compared with 52 cents per pound estimated for the 2011/12 marketing year, while soybean meal prices are projected at $450 per short ton, up from an estimated $394 per ton for the 2011/12 marketing year.

See current ERS Oil Crops Outlook and data on production, use, yield, and prices.

Wheat

Few changes were made in 2012 U.S. wheat production estimates in the August, September, October, or November WASDE reports. Wheat is widely produced across much of the drought-affected area of the Midwest, but most of the wheat in this region is harvested in the spring and early summer, so it reached maturity before the dry conditions materialized.

Fall harvested wheat (spring wheat) is produced mainly in Upper Midwest and Northern Plains areas that were relatively less affected by the drought. Consequently, final 2012 wheat yields estimated at 46.3 bushels per acre were 2.6 bushels per acre above estimates for the 2011 crop, and wheat production in 2012 was expected to exceed 2011's harvest by 270 million bushels, or more than 13 percent.

U.S. wheat feed and residual use in 2012/13 was projected up from the 2011/12 marketing year, due to larger 2012 U.S. wheat production and the tighter market conditions for corn. U.S. wheat exports were also projected slightly higher than in 2011/12, in response to reduced foreign wheat production. However, combined with the larger production in 2012, U.S. wheat stocks at the end of the 2012/13 marketing year were expected to be only about 5 percent lower than 2011/12 ending stock levels.

Wheat prices were estimated to average $7.80 per bushel for the 2012/13 crop, up from $7.24 in 2011/12.

See current ERS Wheat Outlook and data on production, use, yields, and prices.

Cotton

While conditions were dry in many cotton producing regions of the United States throughout 2012, they were much improved from the drought conditions experienced in 2011. The final yield estimate for the 2012 crop was set at 887 pounds per acre, up from 790 for the 2011 crop. And, despite 2.38 million fewer acres planted to cotton in 2012, harvested acreage was nearly identical to 2011 levels, reflecting sharply lower abandonment in 2012. The result is that U.S. cotton production in 2012 exceeded 2011 levels by about 1.75 million bales, or about 11 percent.

Compared with a marketing-year average price of 88.3 cents per pound in 2011/12, upland cotton prices were projected to average 72 cents per pound for the 2012/13 crop year, based on WASDE estimates

released in June 2013.

See current ERS Cotton Outlook and data.

Further Revisions to Field Crop Production Estimates

Monthly revisions to 2012 production estimates for major U.S. crops continued as NASS conducted surveys of production prospects. Final NASS estimates of the 2012 production of crops were released in January 2013.

Livestock Sectors

The outlook for U.S. livestock sectors through summer 2013 remained mostly unchanged from earlier USDA forecasts. Drought-induced prospects for higher feed prices and heat stress on crops, pastures, livestock, and poultry continued to restrain growth of U.S. cattle and hog breeding herds as well as poultry and milk production. Following on the heels of 2011's drought in the Southern United States, 2012's lack of adequate rainfall over more than half of the country resulted in reduced corn and soybean crops, higher prices for corn, soybean meal, and other feed, and reduced availability of hay and pasture in 2013.

As of mid-June 2013, less than a fourth of pastures and ranges in the United States were rated poor to very poor, compared with 58 percent on September 9, 2012, just 40 percent at the same time in 2011, and 31 percent on average from 2000 to 2010. Lack of pasture continues in 2013 to induce growers to place cattle on feed at lower weights; this coupled with higher grain prices is further reducing prices of feeder cattle in the near term. The impact of placing cattle on feed sooner is likely to result in greater production declines in 2014 than in 2012-13, potentially leading to higher prices in 2014 and beyond. Beef production in 2013 was projected in the June 2013 WASDE report to decline 1.8 percent from 2012 levels, and to decline another 5.2 percent in 2014. Pork production is also expected to experience a decline in 2013, while milk production is expected to remain stable and broiler production to increase slightly.

Feedlot operators are paying lower prices for feeder cattle as higher feed costs and reduced availability of pasture has led to increased supply of feeder cattle. Feeder cattle prices were expected to remain in the $138-150s range for the remainder of 2013 but to rise into 2014.

Imports of feeder cattle from Mexico, which had been above a year earlier for most of 2012, began to decline in July and August 2012 and continued to average over 40 percent below 2012 levels in 2013.

Heat stress, higher feed prices, and the potential for reduced hog and poultry inventories continued to dampen the outlook for pork and poultry production into 2013.

Broiler production estimates for 2013 are expected to be 37,768 million pounds, up from 37,039 in 2012.

Hog farrowings (litters of pigs) declined in the second-half of 2012 and are expected to remain lower in the first three quarters of 2013 because of continued high feed prices. Pork production for 2013 is expected to be slightly less than 1 percent below 2012 at 23,427 million pounds.

Milk production in 2012 was 2.0 percent higher than in 2011, but continued high feed costs were expected to result in 2013 milk production rising about 0.7 percent, while milk prices were to remain lower than 2011 and 2012 levels. Milk prices received by farmers averaged $20.14 per hundredweight (100 pounds) in 2011, $18.53 in 2012, and were projected at $19.60-$20.00 per hundredweight in 2013.

See current ERS Livestock, Dairy and Poultry Outlook and Livestock & Meat Domestic Data.

Further Information:

ERS Commodity Outlook: market information on key commodities

USDA Drought Assistance information

World Agricultural Supply and Demand Estimates (WASDE) report

USDA's National Agricultural Statistics Service: monthly Crop Production reports, Crop Production 2012 Summary, weekly Crop Progress reports, and Weekly Weather State Reports

World Agricultural Outlook Board: Weekly Weather and Crop Bulletin

USDA Agricultural Weather and Drought Update (blog) - crop and pasture impacts and latest updates

Federal Bureau of Labor Statistics reports food prices

U.S. Drought Monitor

Water Conservation in Irrigated Agriculture: information on trends in water use and conservation