

# USDA Agricultural Projections to 2023

## Interagency Agricultural Projections Committee

### Introduction and Projections Overview

This report provides longrun projections for the agricultural sector to 2023. Major forces and uncertainties affecting future agricultural markets are discussed, such as prospects for long-term global economic growth and population trends. Projections cover production and consumption for agricultural commodities, global agricultural trade and U.S. exports, commodity prices, and aggregate indicators of the sector, such as farm income.

The projections are a conditional scenario based on specific assumptions about the macroeconomy, agricultural and trade policies, the weather, and international developments. The report assumes that there are no domestic or external shocks that would affect global agricultural markets. Normal weather with trend crop production yields is generally assumed. Provisions of the Food, Conservation, and Energy Act of 2008 (the 2008 Farm Act), the Energy Independence and Security Act of 2007, and the Energy Improvement and Extension Act of 2008 are assumed to be extended and remain in effect through the projection period (see box below for further discussion of U.S. agricultural policy assumptions). Thus, the projections are not intended to be a forecast of what the future will be, but instead are a description of what would be expected to happen under these very specific circumstances and assumptions. As such, the projections provide a neutral reference scenario that can serve as a point of departure for discussion of alternative farm-sector outcomes that could result under different domestic or international assumptions.

The projections in this report were prepared during October through December 2013 and reflect a composite of model results and judgment-based analyses. Short-term projections used as a starting point in this report are from the November 2013 *World Agricultural Supply and Demand Estimates* report. The macroeconomic assumptions were completed in October 2013.

In the near term, the agricultural sector continues to respond to high prices for many farm commodities in recent years. Global agricultural production of most major crops remains high, for example, and prices initially fall. Following those near-term adjustments, longrun developments for global agriculture reflect steady world economic growth and continued global demand for biofuels. Those factors combine to support longer run increases in consumption, trade, and prices of agricultural products. Thus, following reductions from 2013 levels through 2016, farm cash receipts and the value of U.S. agricultural exports grow beyond 2016. Although farm production expenses also increase beyond 2015, net farm income remains historically high.

#### U.S. Policy Assumptions

USDA's long-term projections in this report reflect analysis conducted during October through December 2013. Therefore, the projections do not reflect the subsequently enacted Agricultural Act of 2014. Instead, the 2008 Farm Act was assumed to be extended and remain in effect through the projection period.

## Key Assumptions and Implications

**Major assumptions underlying the projections and selected implications include:**

### *Economic Growth*

- Global economic growth is assumed to average 3.2 percent annually over the next decade. Relatively weak economic growth is assumed for developed countries, but stronger growth is assumed in developing countries. As a result, developing countries become a larger part of the world economy. Relatively high growth rates in China, India, and other areas of developing Asia, Africa, and Latin America underpin the anticipated macroeconomic gains for developing countries.
- Among developed countries, Japan's economic growth continues to face constraints from long-term structural rigidities, a political process that makes economic reform difficult, and an aging population. Growth in the European Union (EU) will be limited by continuing Eurozone financial difficulties.
- The U.S. economy is projected to grow at an average rate of about 2.6 percent over the next decade. The U.S. share of global gross domestic product (GDP) falls from about 26 percent currently to less than 25 percent at the end of the projection period.
- Steady global economic growth supports longer term gains in world food demand, global agricultural trade, and U.S. agricultural exports. Economic growth in developing countries is especially important because food consumption and feed use are particularly responsive to income growth in those countries, with movement away from traditional staple foods and increased diversification of diets.

### *Population*

- Stronger global economic growth over the next decade contributes to the continued slowing of population gains around the world as birth rates decline. Growth in global population is projected to average about 1.0 percent per year compared with an average annual rate of 1.2 percent in the last decade.
- Population growth rates in most developing countries are projected to slow, although they remain above those in the rest of the world. As a consequence, the share of world population accounted for by developing countries continues to rise, accounting for 82 percent in 2023.
- Population gains in developing countries, along with increased urbanization and expansion of the middle class, are particularly important for the projected growth in global food demand. Populations in developing countries, in contrast to those in more-developed countries, tend to be both younger and undergoing more rapid urbanization, factors that generally lead to the expansion and diversification of food consumption.

### ***Value of the U.S. Dollar***

- Following a 10-year depreciation of the U.S. dollar from 2002 to 2011, a moderate appreciation has recently occurred, with further appreciation projected for the next decade. Nonetheless, the dollar remains relatively weak compared to the past two decades.
- The low-valued dollar will continue as a facilitating factor for gains in U.S. agricultural exports. Although trade competition will continue to be strong, the United States will remain competitive in global agricultural markets, with export gains contributing to longrun increases in cash receipts for U.S. farmers.

### ***Oil Prices***

- After declining in 2014, both nominal and real crude oil prices are assumed to increase over the next decade as global economic activity improves. By the end of the projection period, the nominal refiner acquisition cost for crude oil imports is projected to be near \$150 per barrel, compared with about \$101 projected for 2014.
- Increases in crude oil prices raise production costs in the agricultural sector.

### ***U.S. Agricultural Policy***

- The 2008 Farm Act is assumed to be extended through the projection period. The analysis was completed before the subsequent enactment of the Agricultural Act of 2014.
- Acreage enrolled in the Conservation Reserve Program (CRP) is projected to decline to about 26 million acres in 2014 before rising back to close to its legislated maximum under the 2008 Farm Act of 32 million acres toward the end of the projections.
- Lower crop prices projected over the next several years lead to sharply higher direct Government payments to farmers in 2015 through 2017, mostly reflecting large payments under the Average Crop Revenue Election (ACRE) program of the 2008 Farm Act. Beyond 2017, direct Government payments are lower and below the average of 2001-10. Consequently, the sector relies more on the market for its income. The CRP and fixed direct payments are the largest Government payments to the U.S. agricultural sector after 2017.

### ***U.S. Biofuels***

- Limited additional growth is projected for ethanol production, with increases much smaller than occurred in 2000-2010. Nonetheless, high levels of domestic corn-based ethanol production continue over the next decade, with about 35 percent of total corn use projected to go to ethanol production,
- The 10-percent ethanol “blend wall” and projected declines in overall gasoline consumption in the United States are assumed to significantly slow any expected expansion in ethanol production over the next decade. Most gasoline in the United States continues to be a 10-percent ethanol blend (E10). Infrastructural and other constraints severely limit

growth in the E15 (15-percent ethanol blend) market. The E85 (85-percent ethanol blend) market, while growing, remains very small.

- The \$1-per-gallon tax credit for blending biodiesel expired at the end of 2013 and is assumed to be unavailable in the projections.
- The biomass-based diesel use mandate, as administered by the U.S. Environmental Protection Agency (EPA), rose to 1.28 billion gallons for 2013 and is assumed to remain at that level throughout the projection period.
- As suggested in EPA's final rule for the Renewable Fuel Standard (RFS) for 2013 (and subsequently supported by the proposed 2014 RFS rule), the projections assume that EPA will adjust the advanced biofuel and total renewable fuel mandates to reflect market conditions. As a consequence, the projections assume the nonspecific advanced biofuel mandate remains low. Thus, while some biodiesel production above its own mandate is assumed to meet a portion of the nonspecific advanced biofuel mandate, that additional volume of biodiesel is small.
- Soybean oil, other first-use vegetable oils, corn oil extracted from distillers grains, animal fats, and recycled vegetable oil are used as feedstocks to produce biodiesel in the projections, with soybean oil assumed to account for about half of total biodiesel production.

### ***International Policy***

- Trade projections assume that countries comply with existing bilateral and multilateral agreements affecting agriculture and agricultural trade. The report incorporates effects of trade agreements, sanitary and phytosanitary restrictions, and domestic policies in place in November 2013.
- Domestic agricultural and trade policies in individual foreign countries are assumed to continue to evolve along their current paths, based on the consensus judgment of USDA's regional and commodity analysts. In particular, long-term economic and trade reforms in many developing countries are assumed to continue.
- The projections assume that Russia will continue to use policies to stimulate its domestic pork and poultry production and to limit its reliance on imports.

### ***International Biofuels***

- Global expansion of biofuel production is projected to continue during the next decade, although at a slower pace than over the last half decade. As a result, demand for biofuel feedstocks also grows at a slower pace.
- The largest biofuel producers include the United States, Brazil, the EU, and Argentina. The EU remains the world's largest importer of biofuels throughout the projection period. Argentina and Brazil continue to be the world's dominant biofuel exporters—Argentina mostly in soybean oil-based biodiesel and Brazil in sugarcane-based ethanol.

## *Prices*

- Prices for many major crops are projected to decline in the near term as global production responds to high prices of recent years. Nonetheless, after these initial price declines, long-term growth in global demand for agricultural products, a low-valued dollar, and continued biofuel demand, particularly in the United States, the EU, Brazil, and Argentina, hold prices for corn, oilseeds, and many other crops above pre-2007 levels.
- Prices in the livestock sector initially reflect responses to reduced feed costs as improved livestock-sector net returns provide economic incentives for expansion. Prices for hog and broilers generally decline in the first half of the projection period as production levels for those meats rise. In contrast, beef cattle prices rise as beef production continues to decline for several years. Increases in beef cattle, hog, and broiler prices are generally less than the general inflation rate in the later years of the projections. After declining in 2014-16, nominal farm-level milk prices are projected to gradually rise over the rest of the projection period, with increases less than the overall rate of inflation largely reflecting efficiency gains in production.
- High commodity prices led to record values of U.S. agricultural exports and U.S. net farm income in 2013. Projected reductions in prices for most major crops over the next several years result in declines in export values and farm cash receipts through 2016. Export values and cash receipts then grow over the rest of the projection period as prices increase. Although farm production expenses also increase beyond 2015, net farm income remains historically high.