

# ERS Bioenergy Information and Research

The tremendous expansion of bioenergy production raises several key questions: Where will ethanol producers get the corn needed to increase their output? How will increased demand for biodiesel affect soybean markets? What will be the impact on livestock production of increased use of crops for energy? How will international markets for commodities and renewable energy be affected? Will rural communities benefit from local production of ethanol? Will food prices increase due to competing uses for grains? How will increased bioenergy production impact environmental quality? Although grain-based ethanol is currently the major source of bio-fuels in the U.S., continued research to improve the conversion efficiency of cellulosic biomass feedstocks eventually will increase the range of crops that can be grown for energy production in the future.

The rapid increase in grain-based ethanol production along with the potential for cellulosic ethanol has profound implications for crop prices, commodity markets, land use, rural communities, consumers, and environmental quality. ERS is approaching the bioenergy production issue in several ways:

- monitoring the state of the agricultural system and rural communities;
- providing market analyses;
- developing projections of commodity supply, demand, and retail food prices; and
- conducting in-depth research on policy-relevant topics.

## Information Products

ERS develops and monitors key indicators of the agricultural system and rural communities. The effects of bioenergy production will be part of the ongoing indicators work. The Agricultural Resource Management Survey (ARMS) provides annual data that are used to generate information on farm business income, farm household income, and costs of production for selected crops. ERS monitors community employment, county business patterns, and other rural factors. Using both government and proprietary data sources, ERS monitors consumer and producer prices and models the impact of input cost changes on prices across the food supply chain. Each of these indicators will reflect impacts from changes induced by increased bioenergy production.

ERS analysts participate in the USDA consensus forecasts for crops and livestock that are published monthly. In addition, ERS regularly publishes commodity newsletters and yearbooks that now include market impacts of bio-energy (particularly corn-based ethanol) for the crop and livestock sectors. Ongoing ERS market analyses will include estimation of the demand for corn for ethanol and markets for ethanol byproducts (distiller's grains).

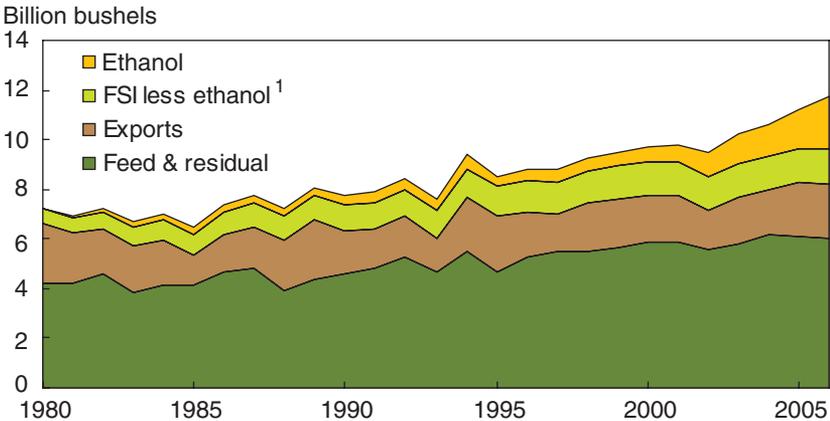
ERS is part of the interagency group that develops the USDA agricultural baseline, which provides long-run projections for the farm sector for the next 10 years. Projections cover agricultural commodities, agricultural trade, and aggregate indicators of the sector, such as farm income and food prices. Corn usage for ethanol helps to drive long-term forecasts of crop prices, returns to livestock production, agricultural trade, and budget expenditures under current farm programs. Ongoing ERS work on the baseline will include an assessment of the acreage shifts that would be necessary to accommodate higher corn use for ethanol, and estimates of how domestic feed use and corn exports will adjust to changing markets.

## Planned Research

### ***Effects of increased ethanol production on livestock and poultry industries.***

Livestock industries face higher production costs as a result of increased ethanol production. Domestic livestock industries and foreign buyers will face more competition for available feed grains. Distiller's grains are a co-product of corn-based ethanol production, and can be substituted for corn in some livestock rations, chiefly dairy and beef cattle. Ethanol production will affect the competitiveness of different categories of livestock and different regions, as well as the structure of the industry.

### U.S. corn use



<sup>1</sup>Food, seed, and industrial.

Source: USDA WASDE, December 2006

ERS research will:

- Assess how the increases in corn prices and ability of livestock to use ethanol byproducts in feed rations affect competitiveness and market structure.
- Assess the extent to which wet or dried distiller's grains replace corn and protein meal in livestock rations.

### ***Effects of higher corn prices on retail food prices***

Corn prices are a concern to both food producers and consumers as corn is a major source of animal feed and an ingredient in a number of foods, so increases in corn costs will have an impact on consumers.

ERS research will:

- Use producer and consumer price data to model the impact of higher corn commodity costs on producer and consumer prices.
- Provide forecasts of the range of changes that may arise in retail food prices due to higher corn prices.

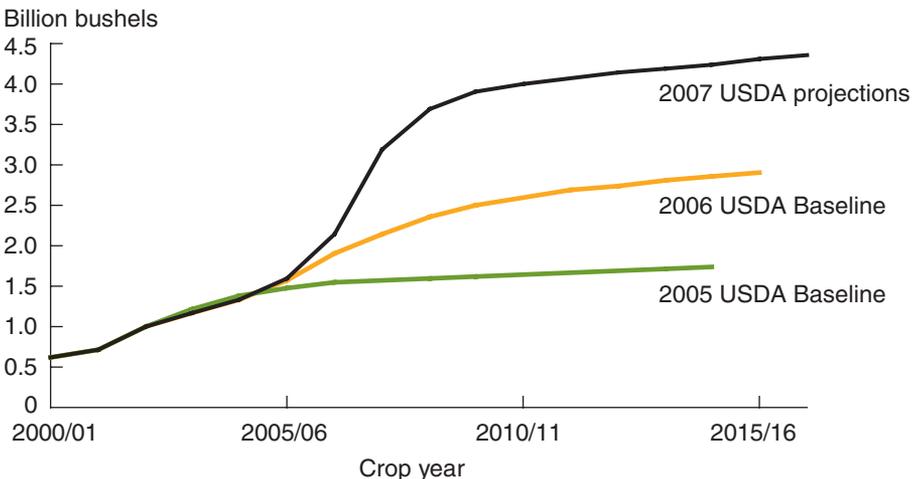
### ***Implications of increased ethanol production for farm policy.***

Higher commodity prices (led by corn) are changing the terms of debate for farm programs, as traditional forms of support (marketing loans and counter-cyclical payments) become less relevant.

ERS research will:

- Assess how increased demand for corn may affect the distribution of government payments under current programs.
- Evaluate alternatives to current farm programs, including proposals

### **Projections of corn used in ethanol production**



for revenue assurance that would address problems of income variability rather than low prices.

### ***Impacts of bioenergy development on rural communities.***

ERS research will:

- Assess how bioenergy production will influence rural population and employment.

### ***Bioenergy policies: A global perspective.***

Many countries around the world are exploring ways to transition to more bio-based energy. Increased demands for biomass will have implications for the economies and environments of these countries and will affect global markets.

ERS research will:

- Use an integrated modeling framework to analyze global changes related to long-run agricultural and environmental conditions, including the effects of increased production of bio-based fuels on land, water, labor, and other resources.

### ***Impacts of energy-induced land-use changes on conservation goals and environmental quality.***

Increased demand for corn or other bioenergy crops will tend to expand the acreage dedicated to that crop as farmers change crops, alter rotations, or bring uncultivated land into production. These actions have implications for the types of practices that are used and the environmental impacts that will result.

ERS research will:

- Assess the relative productivity and potential yields of currently unfarmed lands that could be used for crop-based ethanol production.
- Use a model of the agricultural sector to analyze effects of various ethanol production scenarios and to estimate environmental outcomes.

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