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Ethanol demand: Growth and implications for grain producers

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Ethanol demand: Growth and implications for grain producers

Abstract
Midwest agriculture is in the midst of a rapid shift from primarily a food producer to being a major source of energy as well. Exceptionally high world crude oil prices in the last three years have brought huge investments in ethanol plants throughout the Midwest and even in areas far from the Corn Belt. In Iowa, combined corn processing capacity for ethanol and other corn products will soon be equivalent to more than half of the 2006 Iowa corn crop. If all planned plants are built, processing capacity would be equivalent to 133 percent of last year’s crop—within three to five years.

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M idwest agriculture is in the midst of a rapid shift from primarily a food producer to being a major source of energy as well. Exceptionally high world crude oil prices in the last three years have brought huge investments in ethanol plants throughout the Midwest and even in areas far from the Corn Belt. In Iowa, combined corn processing capacity for ethanol and other corn products will soon be equivalent to more than half of the 2006 Iowa corn crop. If all planned plants are built, processing capacity would be equivalent to 133 percent of last year's crop—within three to five years. At the national level, existing processing capacity and plants under construction or being expanded will likely boost total capacity to the equivalent of about 40 percent of last year's corn production—within the next 15 to 18 months. If all planned and proposed corn-based plants in the United States were built, corn processing capacity would exceed the 2006 U.S. crop by at least one-fifth. Current returns for processing corn into ethanol are quite favorable. Until the economics of converting corn to ethanol deteriorate through higher corn prices and lower ethanol prices, the expansion is almost certain to continue. Because of limited crop acreage, U.S. processing of corn for ethanol appears likely to reach an upper limit of about 5.5 billion bushels by the end of this decade. If crude oil prices were to fall sharply, the upper limit would be a bit lower. Crude oil prices have been drifting lower in recent weeks, but both the U.S. Department of Energy and the New York futures market expect the decline to end soon, with prices trending upward in the years ahead.

**Current production not meeting demand, despite good yields**

Another indication of pressure to increase corn acreage comes from current supply figures and demand prospects for the current marketing year. Last year's U.S. corn yield was the second highest on record. Even so, production was about 1.3 to 1.4 billion bushels below potential demand. Most of the production-use gap this year can be filled by drawing down the large carryover stocks to minimum levels needed for normal operations from August 31 until new crop supplies are available. However, the market also will need to ration away about 100 to 200 million bushels of demand through higher prices. This is the second consecutive season that production has fallen short of market demand. The 2005 U.S. crop was about 200 million bushels below total use.

For the 2007–08 marketing year, beginning carryover stocks are expected to be about the minimum level needed by the grain trade, a very tight 3.0 to 3.5 weeks' supply. That means production will need to be large enough to fill the current production-use gap and also accommodate at least another billion bushels of demand, growth that is anticipated as newly constructed ethanol plants come online in the next 12 months. Feed demand also appears likely to remain large, but exports may decrease modestly next season if foreign crops are better than in 2006.

**Market will buy more corn acres**

With rapidly expanding ethanol demand, the main job of the corn market through spring will be to keep corn prices high enough to encourage at least a 12 to 14 percent increase in 2007 U.S. plantings. Further increases appear almost certain to be needed again in the following two or three years. Acreage of grain, soybeans, and cotton nationally has declined by about 15 million acres in the last 10 years. Declining total acreage tells us that most of the extra corn acres will
have to come from other crops. That means shifting soybean acres to corn, although a few extra corn acres may come from oats, hay, and pasture, as well as wheat in the eastern and extreme western parts of the Corn Belt. In the main Corn Belt, there are 7.1 million acres in the Conservation Reserve Program (CRP), which includes buffer strips along streams and ditches, reclaimed wetlands, and reforested land. Realistically, a maximum of around 3.5 to 4.0 million CRP acres may be released from CRP for corn and soybean production over the next few years. There is speculation that some of these acres will be released for cropping in 2007, but at this time, no decision has been made. Much of the 37 million acres of CRP land is in the Great Plains, in areas too dry for corn. As the Soybean Belt moves farther west, displacing wheat, oats, and barley, some CRP acres in that region may be returned to wheat production.

**Iowa and U.S. ethanol plants**

Figure 1 shows the location of existing and planned corn processing plants in Iowa. The circles represent approximate corn supply areas for the plants, along with those of plants just across the state borders. These supply areas are only approximations since they do not take into account nearby livestock feed demand and do not fully reflect geographic variations in corn yields. Figure 2 shows plants that were being planned at the national level in late August 2006. Many additional newly planned plants have been announced since that time that also will require Midwest corn.

This rapidly expanding demand will keep corn prices much higher through the planting season than in recent years to encourage farmers to plant more corn. For the next several years, corn prices appear likely to be higher and much more volatile than in the last several years. Prospects for reduced soybean acres and new biodiesel plants also will keep soybean prices higher than in recent years. However, the upside potential in the soybean market will be tempered some by expectations that higher prices will restart the soybean expansion in Brazil. Also, sharply increased supplies of distillers grain and solubles (DGS) will compete with soybean meal. DGS has a protein content in the 24–26 percent range (dry basis) and can replace some corn as well as soybean meal in livestock and poultry rations. Dry DGS supplies represent about 30 percent of the initial weight of corn before it is processed. With DGS supplies tempering the upside potential on soybean meal prices, soybean oil will have to account for more of the value of soybeans than in the past. That puts upward pressure on soybean oil prices, and at some point will shift demand for biodiesel to feedstocks, such as recycled cooking oils, animal fats, and corn, canola, cottonseed, sunflower, and possibly palm oils. Technology is now available to remove corn oil from DGS. Removing the oil makes DGS more suitable for use in hog rations as a substitute for soybean meal but less suitable for poultry because it lowers the energy content. DGS can be fed at high levels in beef feedlots and in dairy rations. For hogs and poultry, its current nutritional composition tends to limit its use to 12 to 15 percent of swine and poultry finishing rations.

**Market signals to plant more corn**

The grain markets are sending a strong signal to farmers to consider shifting substantial acreages from soybeans to corn. In recent weeks, cash corn prices have been nearly double last summer’s levels, while soybean prices have been up only 25 to 40 percent. Whether it makes sense to shift your rotations to more corn this year and in the future will depend on:

- your soil types and topography;
- the yield drag you expect with back-to-back corn acres;
- impacts of shorter planting and harvesting seasons on your operation;
- availability of best-yielding varieties of seed corn; and
- available storage, drying, transporting, and unloading capacity on your farm and at local elevators.

Sizable shifts to more corn appear likely in the best corn-growing regions of the Midwest. However, some areas will not shift as much land to corn as in central and northern Iowa, southern Minnesota, central and northern Illinois, and areas of Nebraska where irrigation water is adequate for more corn acres. A very sharp increase in corn acres will be needed in the best corn-growing areas to push U.S. acreage up by 12 to 14 percent this year. Failure to reach this level of acreage and/or below-trend yields in 2007 would bring very strong corn prices in the next year.

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Figure 1. Iowa corn processing and ethanol plants, current and planned (10/26/06).

Figure 2. Existing and planned U.S. corn processing plants (8/30/06).

Planned or current in Iowa: 63
Just across the borders: 11