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CORN YIELD EXPECTATIONS

Corn prices have declined sharply since mid-June, reflecting a combination of a slow down in the rate of exports and growing confidence that the 2007 crop will be large. The USDA's June *Grain Stocks* report also implied a substantial decline in the rate of domestic feed and residual use of corn and the *Acreage* report showed a larger-than-expected increase in planted acreage of corn.

By the end of July, the market had grown increasingly confident that the 2007 U.S. average corn yield would exceed trend value and would exceed the early USDA calculation of average yield based on trend, planting date, and normal weather. That calculation of 150.3 bushels per acre, along with the projection of 85.4 million acres of corn harvested for grain, results in a 2007 production forecast of 12.84 billion bushels. At that level of production, the USDA projected that stocks of corn would grow from 1.137 billion bushels on September 1, 2007 to 1.502 billion bushels on September 1, 2008.

Pointing to July weather that was generally favorable for the completion of pollination, many analysts anticipated a crop in excess of 13 billion bushels. Yield expectations as high as 160 bushels have been reported, suggesting a 2007 crop of 13.66 billion bushels. Pointing to declining crop condition ratings and a warm start to August, however, yield expectations as low as 145 bushels have also been reported. An average yield at that level would suggest a 2007 harvest of only about 12.38 billion bushels. Expectations now seem to be centering on a range of 148 to 153 bushels.

The USDA has been providing weekly reports of observed crop conditions in the major corn producing states since 1986. Over that period, there has been a relatively strong relationship between the U.S. average trend-adjusted yield and the percent of the crop rated in good or excellent condition in the last report of the season. Using the trend increase in yields since 1960, the relationship explains about 80 percent of the annual variation in trend-adjusted yields from 1986 through 2006. Using the trend increase in yields since 1986, the relationship explains about 88 percent of the annual variation of trend-adjusted yields [analysis provided by Scott Irwin, Department of Agricultural and Consumer Economics, University of Illinois]. If crop conditions at the end of the season

remained near the levels reported on July 29, 58 percent good or excellent, the models would project 2007 average yields of 145 bushels and 148.4 bushels, respectively. Over the past 8 years, these models have tended to underestimate the U.S. average yield. For the model based on the trend yield since 1960, the size of the underestimate ranged from 1.75 bushels in 2000 to 10.25 bushels in 2004. The average underestimate was 4.9 bushels. For the model based on the trend yield since 1986, the size of the underestimate ranged from 0.44 bushels in 2000 to 7.41 bushels in 2004. In 2006, however, the model overestimated the U.S. average yield by 0.42 bushels. Over the past 8 years, the average difference between the forecast yield using this model and actual yield was 2.85 bushels. Based on current crop condition ratings and the average model errors over the past 8 years, 2007 yield potential appears to be in the range of 150 to 151 bushels. Yield expectations based on current crop conditions can obviously only be used as a guide in forming expectations about actual yield since the correlation between ratings and yield is less than perfect and ratings may change by the end of the season.

Some argue that the crop is already “made” and is out of harms way. However, models relating trend yield and state average monthly precipitation and temperature to actual state average yields in Illinois, Indiana, and Iowa indicate that August weather has a significant impact on average yields. While August precipitation has less impact than July precipitation on average yields, August temperature appears to have an equal or larger impact than July temperatures [unpublished research by Mike Tunnura, Department of Agricultural and Consumer Economics, University of Illinois].

The USDA will release the first yield and production forecast for the 2007 crop on August 10. The forecast will be based on a combination of factors, including field observations in 10 states and national farm operator surveys (about 27,000 in 2006). That input will reflect conditions through early August so that subsequent forecasts will be influenced by August and September weather. Over the past 11 years of generally favorable growing conditions, the average yield forecast in August was below the January estimate following harvest in 8 years. In those 8 years, the January estimate exceeded the August forecast by an average of 5.8 bushels, in a range of 1.7 to 11.5 bushels. The January estimate was below the August forecast in 1999, 2000, and 2006, by an average of 2.9 bushels and in a range fo 0.9 to 4.8 bushels.

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