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2009 Corn Yield Prospects Improving

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The purpose of this brief is to update our previous evaluation of yield potential for corn in Illinois, Indiana, and Iowa in 2009. (Irwin, Good, and Tannura, 2009). This update makes use of a crop weather model that estimates the impact of technology (trend), state average monthly weather variables, and portion of the crop planted late on state average yield. Previously, that model was used to evaluate 2009 yield potential based on planting progress, state average precipitation through April 2009, and alternative 2009 summer weather scenarios. This update incorporates preliminary state average precipitation for June and alternative weather scenarios for July and August 2009.¹ The yield forecasts for the three states are then used to project the U.S. average yield. Trend yields for 2009 for each of the three states and the U.S. are also presented.

¹ The June weather observations are collected from preliminary data published by the Midwest Regional Climate Center (http://mrcc.sws.uiuc.edu/prod_serv/prodserv.htm). The data do not become official for several months until they are finalized by the Climate Prediction Center. Since the MRCC data only utilizes real-time weather observations, changes in the values are probable once additional weather observations (non real-time) are collected and included for each state.

In addition to yield projections based on the crop weather model, U.S. yield projections are made based on a crop condition model that regresses time (trend) and the sum of good and excellent corn crop ratings reported by the USDA in the final *Crop Progress* report of the season over 1986-2008 on U.S. average yields. The model is specified as:

$$\text{U.S. corn yield} = 60.1817 + 2.3426 \\ \text{X Time} + 0.6592 \text{ X percent rated} \\ \text{good or excellent}$$

This model explained 96 percent of the variation in U.S. average corn yields over 1986-2008. Alternative yield projections using this model are made based on alternative condition ratings at the end of the season.

Finally, alternative U.S. yield forecasts are used to project the potential size of the 2009 corn harvest based on the USDA's June *Acreage* report. That report indicated that 80.107 million acres of corn will be harvested for grain in 2009.

Results of the alternative yield and production forecasts are presented in Tables 1 and 2. Actual yields and the 2009 trend yield calculation for each state are presented in Figure 1. In addition, the estimated impact of the late planting variable and the impact of each of the weather variables to date on the deviation

from the 2009 trend yield in each of the three states are presented in Figure 2.

In Table 1, three alternative forecasts are made using the crop weather model. Each forecast incorporates actual observations through June and alternative forecasts for July-August weather—average, poor, and good. (See Irwin, Good, and Tannura, 2009 for the definition of average, poor, and good). Corn yield forecasts based on the crop weather model are all higher than the forecasts made last month. This follows from the results in Figure 2, illustrating the positive impact of June precipitation on yield prospects.

In Table 2, four alternative forecasts are made using the crop condition model. The first is based on the most recent crop condition ratings. As of June 28, 2009, 72 percent of the crop was rated in good or excellent condition. Alternative forecasts are based on the average crop condition rating at the end of the growing season over 1986-2008, the average of the five lowest crop condition ratings, and the average of the five highest crop condition ratings.

The two models and various scenarios result in a wide range in the U.S. yield forecasts. Forecasts based on the crop condition model are higher than the forecasts from the crop weather model for all three scenarios of average, poor, and good. The forecast from the crop condition model based on crop conditions about July 1, 2009 is similar to the forecast from the crop weather model under the good weather scenario. There is a tendency for crop condition ratings to be high early in the season and to decline during the summer months. Over the past 23 years, an average of 62.8 percent of the crop was

rated good or excellent at the end of the season, 9.2 points below the end of June rating for the 2009 crop. Good summer weather will be required to maintain crop condition ratings near current levels.

U.S. corn yield forecasts range from 133.3 to 170.2 bushel. As a result, production forecasts are also in a wide range, from 10.681 billion to 13.634 billion bushels. The average forecast of the two models is 154.1 bushels for the average scenario, 138.9 for the poor weather scenario, and 166.1 bushels for the good weather scenario, suggesting a potential crop between 11.126 billion and 13.305 billion bushels. The composite forecast of 154.1 bushels based on the assumption of average conditions is a reasonable expectation for 2009 yield at this time. A yield at that level would produce a crop of 12.344 billion bushels.

We suggest caution in the application of the specific forecasts from the crop weather and crop condition models. The forecast errors of previously developed models were relatively large and that is likely the case for the current specification. Standard errors of the forecasts at this point in the growing season could easily exceed 15 bushels per acre. Combined with information from the USDA weekly reports of crop conditions, however, the models can be useful in forming production expectations. We will continue to update the 2009 corn yield and production forecasts as the season progresses. Actual July precipitation levels and alternative forecasts for August weather along with updated crop condition ratings will be used to update forecasts in early August. A similar update will be provided in early September.

REFERENCE

Irwin, S., D. Good, and M. Tannura, "Early Prospects for 2009 Corn Yields in Illinois, Indiana, and Iowa." Marketing and Outlook Brief 2009-01, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, June 2009. Available online: http://www.farmdoc.uiuc.edu/marketing/mobr/mobr_09-01/mobr_09-01.pdf.

Table 1. Alternative Crop Weather Model Forecasts of 2009 Corn Yield in Illinois, Indiana, Iowa, and 2009 U.S. Corn Yield and Production

	Trend Model	Weather Scenario		
		Average July-August	Poor July-August	Good July-August
Panel A. State Yield Forecasts				
Illinois (bu./acre)	166.3	157.3	138.2	172.1
Indiana (bu./acre)	156.8	154.6	137.1	166.2
Iowa (bu./acre)	167.9	175.8	157.1	187.0
3-State Average (bu./acre)	NA	164.8	146.2	177.5
Panel B. U.S. Forecasts				
Yield (bu./acre)	154.9	150.4	133.3	161.9
Production (mil.bu.)	12,405	12,046	10,681	12,970

Notes: NA denotes 'not applicable.' See MOBR 09-01 for a detailed explanation of each state yield forecast. The 3-state average forecasts are weighted by planted acreage for each state as reported in USDA's June 2009 *Acreage* report. U.S. production forecasts for 2009 assume 87.0 million planted and 80.1 million harvested acres, respectively. These figures are also drawn from USDA's June 2009 *Acreage* report.

Table 2. Alternative Crop Conditions Model Forecasts of 2009 U.S. Corn Yield and Production

	Ratings Scenario			
	July 1st	Average	Poor	Good
Yield (bu./acre)	163.9	157.8	144.5	170.2
Production (mil.bu.)	13,127	12,641	11,574	13,634

Notes: U.S. production forecasts for 2009 assume 87.0 million planted and 80.1 million harvested acres, respectively. These figures are drawn from USDA's June 2009 *Acreage* report.

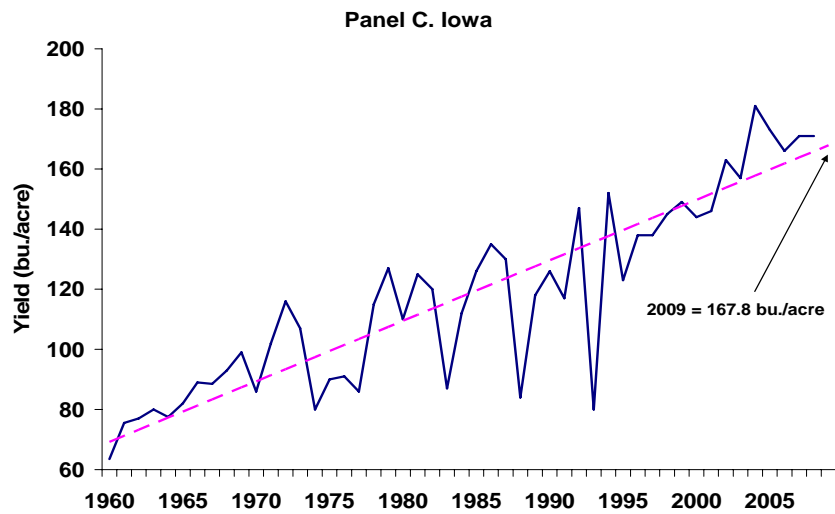
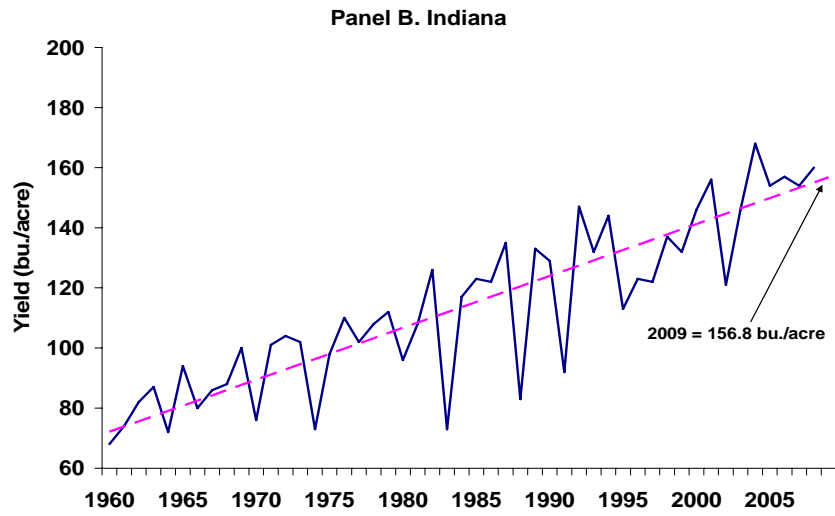
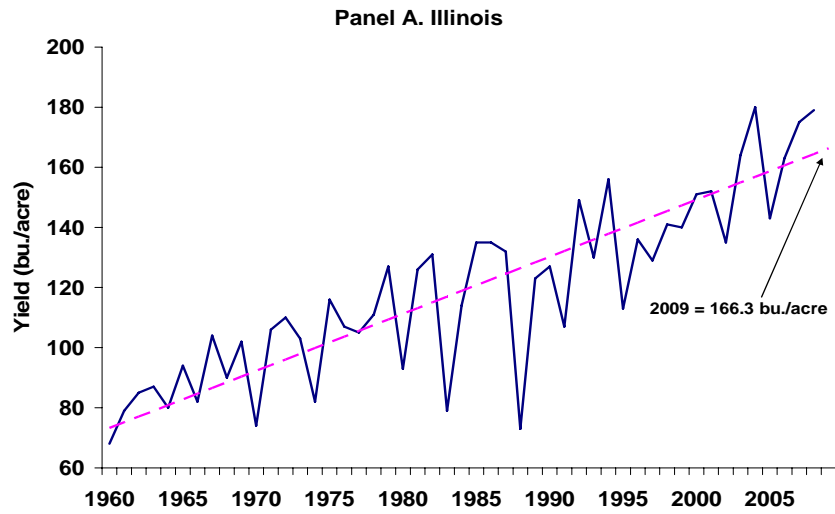


Figure 1. Actual and Trend Corn Yield in Illinois, Indiana, and Iowa, 1960-2008

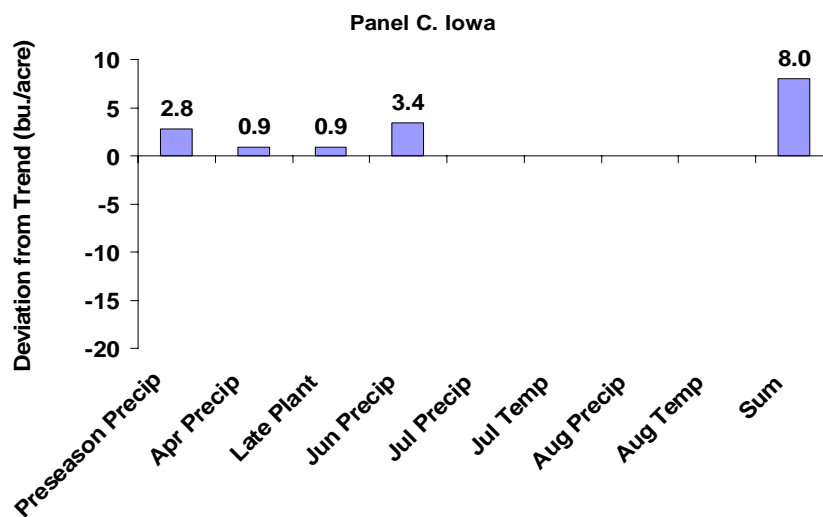
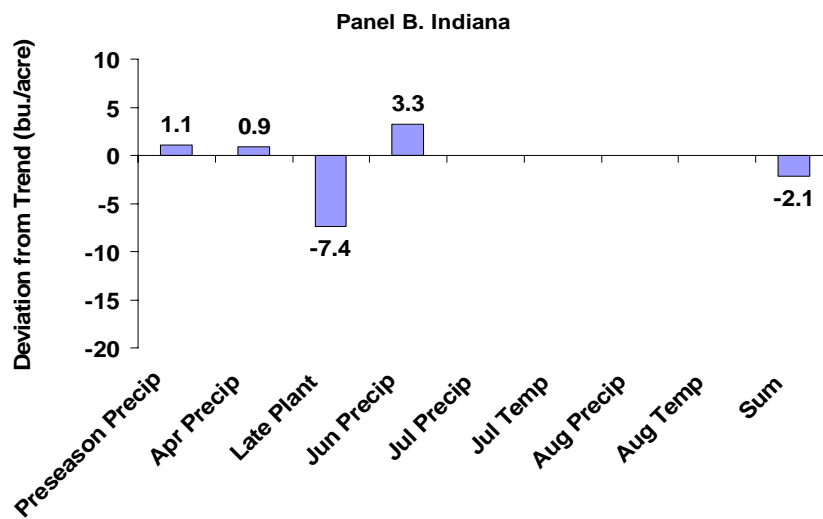
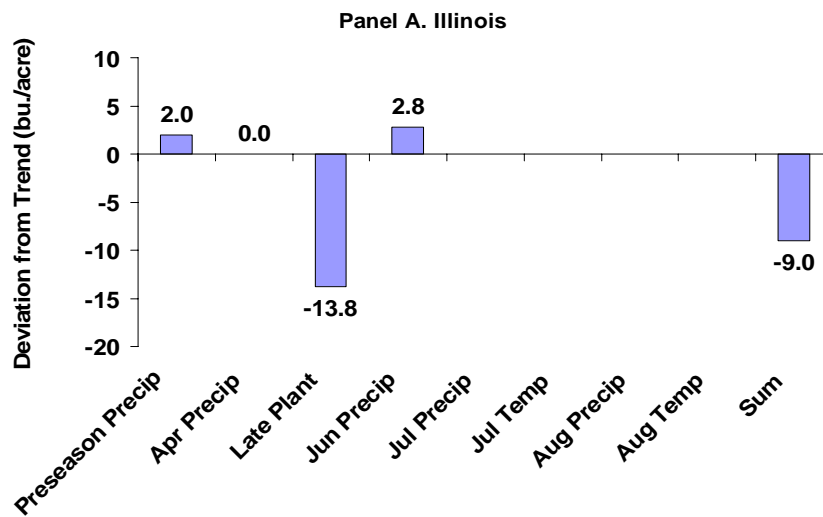


Figure 2. Estimated Impact of Monthly Weather and Late Planting Variables on Deviation from Trend Corn Yield in Illinois, Indiana, and Iowa in 2009