

9-4-2009

Corn Yield Simulations – Late August 2009

Roger W. Elmore

Iowa State University, relmore@iastate.edu

Lori Abendroth

Iowa State University, labend@iastate.edu

Follow this and additional works at: <http://lib.dr.iastate.edu/cropnews>

 Part of the [Agricultural Science Commons](#), [Agriculture Commons](#), and the [Agronomy and Crop Sciences Commons](#)

Recommended Citation

Elmore, Roger W. and Abendroth, Lori, "Corn Yield Simulations – Late August 2009" (2009). *Integrated Crop Management News*. 542.
<http://lib.dr.iastate.edu/cropnews/542>

The Iowa State University Digital Repository provides access to Integrated Crop Management News for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current information on integrated crop management from Iowa State University Extension and Outreach, please visit <https://crops.extension.iastate.edu/>.

Corn Yield Simulations – Late August 2009

Abstract

Cool weather and associated slow growing degree day accumulations describe the 2009 corn growing season to date. Rich Pope discussed degree day trends and comparisons over years in a recent Integrated Crop Management News (ICM) article. Degree day accumulations this year track similar to those of 1992 and 2004 which were both excellent years for corn yield. In an earlier ICM article, the positive aspects of cool night temperatures were discussed: cooler temperatures correlate positively with yield.

Keywords

Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

[Subscribe to Crop News](#)

Archives

[2015](#)[2014](#)[2013](#)[2012](#)[2011](#)[2010](#)[2009](#)[2008](#)[Previous Years](#)

ISU Crop Resources

[Extension Field Agronomists](#)[Crop & Soils Info](#)[Pesticide Applicator Training](#)[Agronomy Extension](#)[Entomology Extension](#)[Plant Pathology Extension](#)[Ag and Biosystems Engineering Extension](#)[Agribusiness Education Program](#)[Iowa Grain Quality Initiative](#)[College of Agriculture and Life Sciences](#)[ISU Extension](#)

Integrated Crop Management NEWS

[PRINT STORY](#)
[EMAIL STORY](#)
[ADD TO DELICIOUS](#)
[ATOM FEED](#)
[FOLLOW ON TWITTER](#)

Corn Yield Simulations – Late August 2009

By Roger Elmore and Lori Abendroth, Department of Agronomy

Cool weather and associated slow growing degree day accumulations describe the 2009 corn growing season to date. Rich Pope discussed degree day trends and comparisons over years in a recent [Integrated Crop Management News \(ICM\) article](#). Degree day accumulations this year track similar to those of 1992 and 2004 which were both excellent years for corn yield. In [an earlier ICM article](#), the positive aspects of cool night temperatures were discussed: cooler temperatures correlate positively with yield.

The [August USDA-NASS](#) Iowa corn yield forecast of 185 bushels per acre if proven correct will be the highest ever recorded. Their next forecast is due on Sept. 11, 2009. During the third week of August, Pro Farmer's [Midwest Crop Tour](#) forecasted 186 bushels per acre for Iowa. Both of these forecasts encourage those involved in corn production. Given allowances for areas devastated by hail as well as specific fields impacted by various diseases, the crop has looked very good. The latest [USDA-NASS Crops and Weather Report](#) rated 76 percent of Iowa's corn as good to excellent. How does the 2009 season look now?

Computer simulation model

We used a computer model, [Hybrid-Maize](#), to predict yields for five Iowa State University Research and Development Farms. The crop model helps us better understand the interaction between management, genetics and weather. It allows us to fix management - planting date, plant population, etc.- and genetics; weather is the only variable that changes across the years. The model predicts the maximum yield possible given the weather conditions experienced in previous years. It assumes that there are no other limiting factors like diseases, insects, low N availability, etc. Yield predictions follow for the five locations based on actual weather through Aug. 28, 2009.

Five predictions

Results from the yield predictions are shown in Figures 1 through 5 along with the assumptions made at each location relative to hybrid maturity, planting date, plant population, and maximum yield predicted for that location. The range in projected grain yield – from best to worst - lessens as the season progresses as more environmental data accumulates. The x-axis is calendar date when predictions were generated.

The predicted lines display three scenarios: the best possible, median, and worst possible scenario. For example, the best-possible scenario uses actual 2009 weather for that location up to the simulation date, and then predicts yield assuming that from that point to maturity the best actual weather in the database ever received at that location will occur.

Figure 1. Lewis IA Hybrid-Maize Yield Predictions - 2009

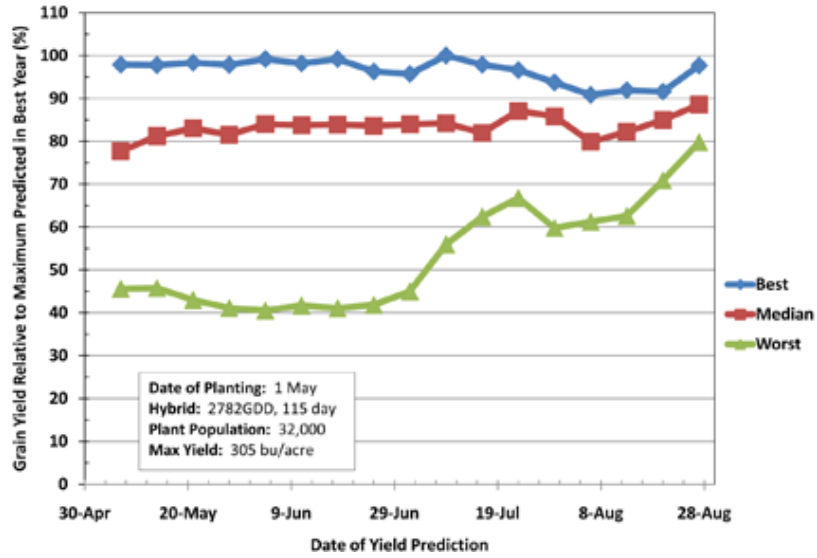


Figure 2. Crawfordsville IA Hybrid-Maize Yield Predictions - 2009

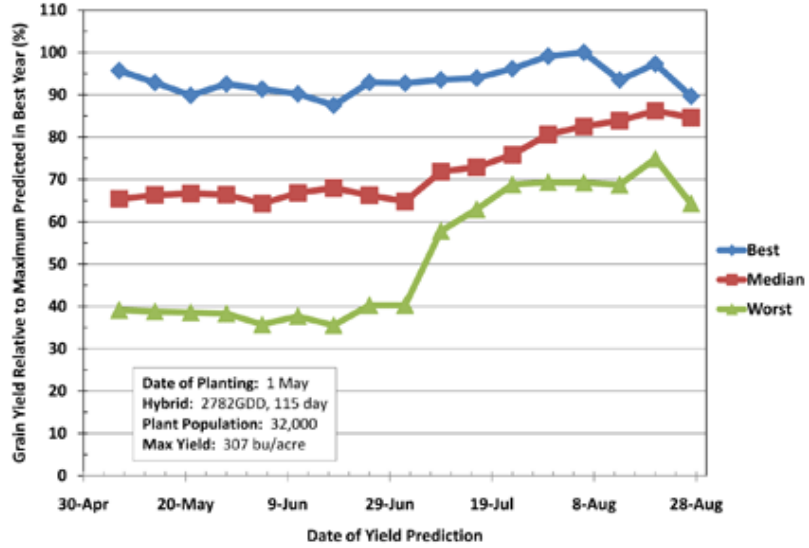


Figure 3. Ames IA Hybrid-Maize Yield Predictions - 2009

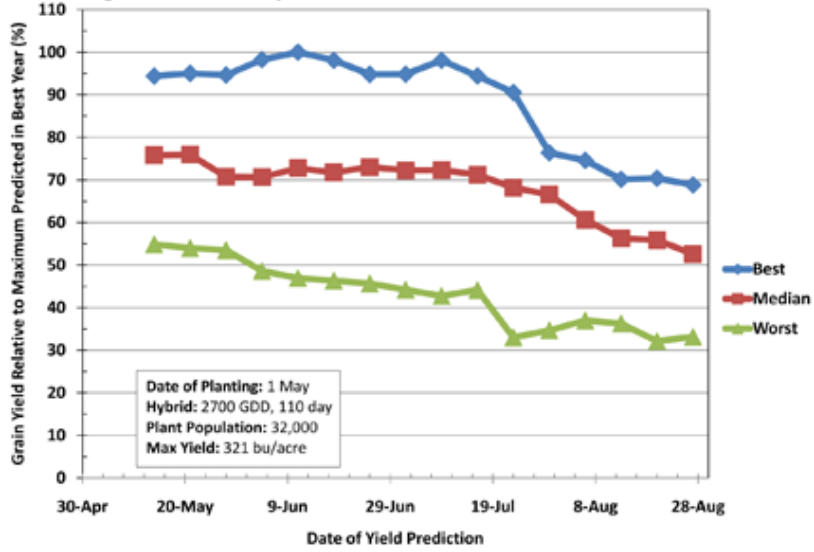
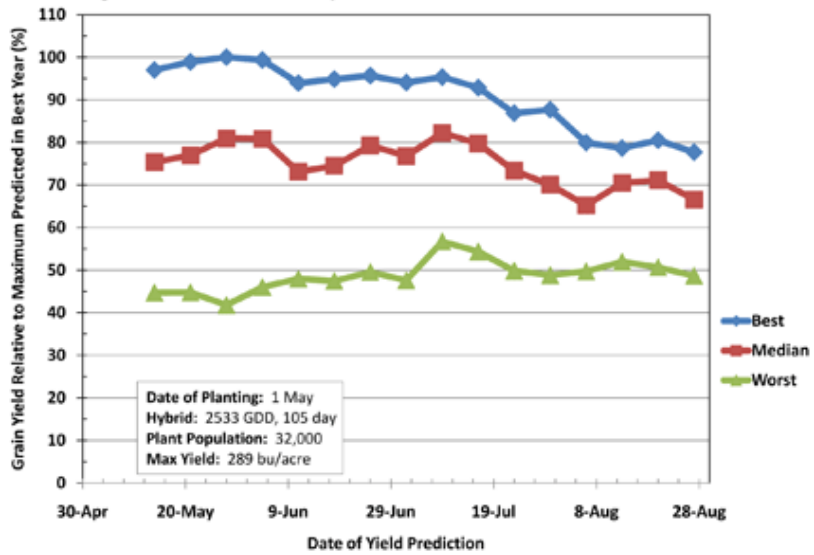
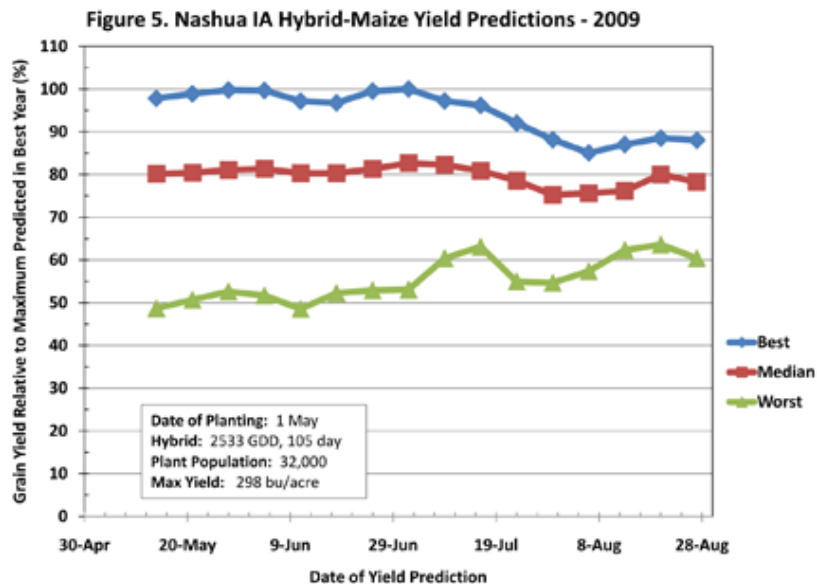


Figure 4. Sutherland IA Hybrid-Maize Yield Predictions - 2009





Predictions for the southwest location, Lewis (near Atlantic), were stable through August and are near 100 percent of maximum (Figure 1). In the southeast, Crawfordsville (south of Iowa City), predictions for the best possible scenario declined in the last three weeks to near 90 percent of maximum (Figure 2). Data from both of these southern locations also show that the predicted yields of the worst yields are increasing; favorable weather enhanced kernel fill. This is encouraging.

On the other hand, best possible yield predictions for the three northern locations - Ames, Sutherland, and Nashua, Figures 3 to 5, continued to decrease beginning in mid-July and now range between 70 and 90 percent of maximum. These trends are likely associated with the significant and continued reduction in growing degree days and indicate that we have lost yield potential during kernel fill.

Impact of even more cool temperatures

Cool temperatures may prevail through September; some [National Weather Service forecast](#) tools suggest that temperatures may be several degrees less than normal. To determine the impact this would have on corn yields, we reduced the high and low temperatures in the database for Ames by 3 degrees F for September. Reduced temperatures lowered the median yield prediction by 15 percent.

Considerations

To achieve the best yields across the state for 2009, the corn crop needs plenty of sunlight and rainfall as well as average temperatures. A late frost is also necessary for a good share of Iowa's corn to maximize grain yield in 2009.

Yield predictions or forecasts are fallible and simply provide a framework for understanding how weather affects yield. The September USDA-NASS yield forecast will provide better insights on the status of the crop during the critical seed fill stages. Will Iowa's corn crop reach a new record?

Roger Elmore is a professor of agronomy with research and extension responsibilities in corn production. Lori Abendroth is an agronomy specialist with research and extension responsibilities in corn production. Elmore can be contacted by email at relmore@iastate.edu or (515) 294-6655; Abendroth can be contacted by email at labend@iastate.edu or (515) 294-5692.

Links to this material are strongly encouraged. This article may be republished without further permission if it is published as written and includes credit to the author, Integrated Crop Management News and Iowa State University Extension. Prior permission from the author is required if this article is republished in any other manner.

Copyright ©2015 [Iowa State University Extension](#) | [Iowa State University](#)
[Contact us](#) | [For Staff](#) | [Nondiscrimination and Information Disclosures](#) | [CMS Admin](#)
Last Updated 9/14/2009