Corn and Dry Soils at Planting, Looking ahead to 2012—Part II: Hybrid maturity changes?

Roger W. Elmore
Iowa State University, relmore@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
http://lib.dr.iastate.edu/cropnews/248

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 Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user.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 and Dry Soils at Planting, Looking ahead to 2012—Part II: Hybrid maturity changes?

Abstract
Dry conditions persist in many parts of Iowa as documented in Part I of this series. Some corn growing areas of the U.S. normally are not so blessed with good soils and precipitation at planting. Corn farmers in those areas sometimes use early-maturing hybrids to help mitigate drought conditions.

Keywords
Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences

This article is available at Iowa State University Digital Repository: http://lib.dr.iastate.edu/cropnews/248
Corn and Dry Soils at Planting, Looking ahead to 2012 – Part II

Part II: Hybrid maturity changes?

By Roger Elmore, Department of Agronomy

Dry conditions persist in many parts of Iowa as documented in Part I of this series. Some corn growing areas of the U.S. normally are not so blessed with good soils and precipitation at planting. Corn farmers in those areas sometimes use early-maturing hybrids to help mitigate drought conditions.

What if it is dry at planting in 2012, should you consider planting an earlier-season hybrid?

Methods

As in the other articles of this series, I used a corn simulation model (Hybrid-Maize) to answer this question. The model uses historic weather data from automated weather stations. I used data from five of ISU’s Research and Demonstration Farms, one in each of the four corners of Iowa and the other near Ames in central Iowa.

The model allows users to change soil moisture conditions at planting to simulate different possibilities. With this capability, we can address the question, “What if the soils are only half field capacity (FC) at planting?”

I compared two moisture levels: A. 75 percent field capacity (FC) in the topsoil (0-12 inches) and 100 percent FC in the subsoil (12-40 inches), and B. 50 percent FC in both topsoil and subsoil. I realize that many soils now are drier than 50 percent FC so the second possibility may be overly optimistic for those areas. Other common inputs for each site modeled are provided in Table 1 (with the exception of hybrids). Factors that varied across locations such as soil textures are shown in Table 2 (see Table 1 and 2 in Part I article).

Given the two soil moisture situations at planting discussed in Part I, the model allows us to simulate the effects of changing hybrid maturities. It assumes a generic hybrid and models corn growth based on temperature, solar radiation and precipitation actually recorded in the weather database for each research farm. I used two hybrids at each location: a full-season and an early-season hybrid. The full-season hybrids at the Northwest (NW) and Northeast (NE) locations required 2500 GDD (about 105 days RM) while the early-season hybrid required 2400 GDD (about 100 days RM). At the Central, Southwest (SW), and Southeast (SE) locations, the full-season hybrids required 2600 GDD (110 days) and the early-season hybrid required 2500 GDD (105 days).

Simulation Results

At four of the five locations, modeled yield of full-season hybrids were greater than those of early-season hybrids in both soil moisture situations (Table 4). However, at NW, early-season hybrids out-yielded full-season hybrids in
about half of the years (54 percent of the years with moist soils and 50 percent of the years with dry soils).

It is interesting to note though that in the years where full-season hybrids yielded more than early-season hybrids, the yield advantage was much greater than in the years where early-season hybrids yielded more than the full-season hybrids. This was true at all locations and with both soil moisture scenarios.

Interestingly, yield estimates for early- and full-season hybrids were consistent across both planting situations, whether soils were relatively moist or dry. The probabilities of either of the hybrids performing well were similar whether soils were moist or dry at planting.

The analysis shows clearly that hybrids of both maturities should be grown. This will spread risk and maximize yields over years.

These simulated data results mirror actual yields obtained from the ISU/Iowa Crop Improvement Association’s ‘Crop Performance Test - Corn.’ These tests are conducted annually at twenty or more locations each year with a full-season and an early-season hybrid trial at each site. Means of the two trials in any specific region are usually similar. Again, this suggests planting both early- and full-season hybrids are important to maximize yields while spreading risk.

**Summary**

We all know that many things can happen between now and planting. If soil moisture conditions do not improve, what I’ve tried to explain here is that planting diverse hybrids with a range of maturities is a good approach...as it is every year. Meanwhile, as before, let’s hope for complete recharge of our soil before planting.

**Endnote:** The articles in this series summarize portions of the 2012 Crop Advantage Series (CAS) talk entitled “Long silks, short pollen, ...a long year” presented in January 2012. Presentation slides with additional detail related to this article are available: [CAS Part II slides](http://www.extension.iastate.edu/CropNews/2012/0131elmore2.htm).

**Table 4.** Years where simulated yields of Early-season hybrids yielded more than Full-season hybrids as affected by whether soils were dry or wet at planting.†
<table>
<thead>
<tr>
<th>ISU Research and Demonstration Farm (Years of weather data)</th>
<th>FC at planting‡</th>
<th>Number of years</th>
<th>Percent of years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northwest (24)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75/100</td>
<td>13</td>
<td>54%</td>
<td></td>
</tr>
<tr>
<td>50/50</td>
<td>12</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td><strong>Northeast (24)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75/100</td>
<td>7</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>50/50</td>
<td>7</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td><strong>Central (26)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75/100</td>
<td>8</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>50/50</td>
<td>9</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td><strong>Southwest (15)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75/100</td>
<td>2</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>50/60</td>
<td>2</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td><strong>Southeast (24)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>75/100</td>
<td>7</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>50/50</td>
<td>7</td>
<td>29%</td>
<td></td>
</tr>
</tbody>
</table>

‡ Full-season hybrids at the NW, NE locations required 2500 GDD (about 105 days RM), early-season hybrid required 2400 GDD (about 100 days RM). At Central, SW, and SE locations, full-season hybrids required 2800 GDD (110 days) and the early-season hybrid required 2500 GDD (105 days).

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

This article was published originally on 1/31/2012. The information contained within the article may or may not be up to date depending on when you are accessing the information.

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.