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Late Planting and Replanting Corn—June 2013 (Part 2)

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Abstract
Fifteen percent of Iowa's 2013 corn crop remains unplanted as we write the last week of May. After early concerns about drought continuing to plague us, wet conditions have taken the spotlight. To add insult to injury, more rainfall forecast may refill field 'ponds' and re-submerge corn in flood plains of our rivers and streams.

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Late Planting and Replanting Corn - June 2013 (Part 2)

Part 2: 2010 and 2011 Field Research Data

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Fifteen percent of Iowa's 2013 corn crop remains unplanted as we write the last week of May. After early concerns about drought continuing to plague us, wet conditions have taken the spotlight. To add insult to injury, more rainfall forecast may refill field 'ponds' and re-submerge corn in flood plains of our rivers and streams.

Producers must make accurate late-planting and replanting decisions by carefully evaluating the situation in terms of projected yields and profitability.

- **For planted fields**, one must ascertain populations of emerged plants. Replant tools (replant checklist) are available for this decision. Corn will withstand two-days of submersion (Corn survival in flooded or saturated soils), so digging plants to check their viability is important too.
- **For unplanted fields and replanting corn**, yield projections for late planting will help estimate returns. Hybrid maturity choice also becomes important when planting in June. Full-season hybrids take longer to mature and are thus more likely impacted by fall frost events. The companion article (Part 1) addressed frost risk inherent with different hybrid maturities using a crop model and provides yield estimates based on long-term weather records. Some may be able to plant soybeans rather than corn and others may choose the 'prevented planting' option of their crop insurance policy (see Johnson and Edwards ICM article). In any case, discuss your options with insurance agents before proceeding on any course of action.

Re-planting the current crop is often an option. Re-plant decisions require extensive management skill. In considering replanting, producers must evaluate replant costs, risks and returns against the current crop's predicted yield. Evaluation of weather patterns and weather predictions for the area, time available, available hybrids, additional fertilizer/herbicide/seed costs, and market trends all must be factored into the decision.

Understanding how hybrids respond to different planting dates is crucial to ensuring optimum yields and maximum profitability in re-plant situations. This report summarizes 2010 and 2011 field research studies aimed to provide producers with more accurate recommendations in corn re-plant situations. We evaluated how commonly-used relative maturity (RM) corn hybrids responded to a range of re-plant / late-planting dates. We included four corn hybrids ranging in their RM at four Iowa locations.

Methods
Multi-year (2010, 2011) and multi-location (four Iowa State University Research and Demonstration Farms) research was conducted, compiled

and analyzed for a total of eight site-years of data. Each site-year incorporated at least four replications and five planting dates ranging from April 30 to June 25 in approximately 14-day increments. Hybrids planted at the two northern locations ranged in RM from 83 to 105 days; those at the Central and SE locations ranged from 93 to 112 day RM. These were hybrids with the same RM – with the same Growing Degree Units – used in the companion article with the crop model.

Results and Discussion

Data from the four locations are shown in Tables 1-4. Dates of first 28 degree F at locations near the experimental sites varied with location and year (Table 5). (Scroll through the entire PDF file to see all five tables.)

Grain moisture content: As expected, grain moisture content at harvest in general was greater with longer season hybrids and increased with delayed planting at all four locations. Hybrids responded differently at the different planting dates at the NW, NE and Central locations. These differences – technically known as interactions – were due to the wider spread in grain moisture among hybrids with later planting. This did not happen at the SE location because of a smaller range in moisture content among hybrids especially at the later planting dates. Thus the over-date averages for hybrids explain responses at SE best; likewise, at SE the over-hybrid averages best represent moisture contents at the different planting dates.

Grain yield: Grain yields were greater with earlier planting dates at all four locations. Fuller- season hybrids yielded as well or more than earlier-season hybrids at all locations. However, at the NW and NE locations, hybrids responded differently at the different planting dates. These differences – interactions – appear to be related to a wider yield spread among hybrids at the earlier planting dates than with later planting dates. At both the Central and SE locations, hybrids responded similarly at all planting dates. Thus, at those locations, hybrid responses are best interpreted when averaged over planting dates, and planting date means are best understood when averaged over hybrids.

Actual 2010 and 2011 data compared to modeled data

Table 5 presents a comparison of potential yield losses derived from the work reported in this article and that reported in the companion article using modeled data. Similar trends occur between the two different approaches. The differences between them are likely due in part to the two year data included in the 'Actual' columns and the multiple year data included in the 'modeled' columns.

To summarize Table 5 we could say that:

- Yield losses associated with delayed planting are greater at NW and NE than at the other two more southern locations.
- If planting occurs on or before June 11:
  - Northern locations: yields could range from about 80 to 85 percent of May 28 yields.
  - Central and SE locations: yields could range from about 85 to 95 percent of May 28 yields.
  - Using the 'actual' data only, yield on or before June 11 was about 70 to 80 percent at the Northern locations, and 88 to 96 percent at the southern locations compared to those of April 30 yields.
- If planting occurs near the end of June (based on Table 5):
  - Northern locations: yields could range from about 50 to 60 percent of May 28 yields.
  - Central and SE locations: yields could range from about 55 to 85 percent of May 28 yields.
  - Using the 'actual' data only, yield before the end of June was about 50 percent at the Northern locations, and 70 to 85 percent at the southern locations compared to those of April 30 yields.

- Data from the actual 2010 and 2011 replant studies consistently show less percentage yield losses with delayed planting than those of the crop simulation model. However, 2010 and 2011 may not have been average years and may have provided distinct advantages for later planted crops. The crop simulation model uses weather data from the mid to late 1980's to 2012 and the output reports 'average' year performance in this situation.

The tables in this report and the companion article should serve as a guide for producers when making late-plant and replant decisions. Producers must consider weather predictions for the area, time available, available hybrids, additional fertilizer/herbicide/seed costs, and market trends plus the data observed here. Only after all other economic variables have been considered should producers utilize the values within this report to estimate likely yields in similar situations.

For more detailed information
Some of the information in this report for the NW, NE, and SE locations was previously reported in the following Research and Demonstration Farm annual reports. More details on plot layout and experimental procedures are included there if you are interested. Central Iowa data has not been reported previously.

- NE Research and Demonstration Farm
- NW Research and Demonstration Farm
- SE Research and Demonstration Farm

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