9-1-1995

Effects of Delayed Seeding on Corn Growth

Robert Hall
South Dakota State University

Recommended Citation

Hall, Robert, "Effects of Delayed Seeding on Corn Growth" (1995). *Extension Extra*. Paper 309.
http://openprairie.sdstate.edu/extension_extra/309

COOPERATIVE EXTENSION SERVICE
SDSU

Extension Extra

ExEx 8112
September 1995
Plant Science

COLLEGE OF AGRICULTURE & BIOLOGICAL SCIENCES / SOUTH DAKOTA STATE UNIVERSITY / USDA

Effects of Delayed Seeding on Corn Growth

by Robert Hall, Extension agronomist-crops

Wet weather during the spring planting season has caused many farmers to ask about the effects of delayed seeding on corn growth and development. Farmers want to know which growth stage to use as they assess possible hybrid maturity changes resulting from delayed seeding

Corn growth differs in response to delayed seeding depending on:

- The growth interval, and
- Whether calendar days (Table 1) or heat units (Table 2) are used to measure the effects of delayed seeding.

When using calendar days, as seeding was delayed, there was a large decrease in days from seeding to emergence (**seeding-emergence** interval) and from emergence to silking (**emergence-silking** interval). This resulted from higher soil and air temperatures which accelerated growth at the later seedings which in turn lead to fewer days during seeding-emergence and emergence-silking. This contrasts with a moderate increase in days from silking to maturity (**silking-maturity** interval). Therefore, when using calendar days to assess delayed seeding it appears that **growth before silking is effected more so than growth after silking**.

Table 1 also shows what effect delayed seeding has on corn maturity. Although the initial difference of 38 days at seeding decreased to 15 days at silking and to 19 days at maturity (end of grain filling date) the **corn** still **reached silking and maturity later when seeded later**. In addition, had the corn been seeded after June 1(the latest seeding date), it would likely have matured later than October 8 (the latest harvest date).

Another way to measure the response of delayed seeding on corn growth is to use "growing degree days" (GDD) or "heat units" (Table 2).

How delayed seeding affects corn growth intervals in terms of heat unit accumulation:

Seeding-emergence interval

Calendar days decreased 11 days or 58% (Table 1) while heat units decreased 60 units or 29% (Table 2). Regardless of method (calendar days vs. heat units) this interval exhibited the greatest percent change between seedings. The change was twice as large when using calendar days as compared to heat units.

The larger difference when using days was likely the result of cool temperatures at the early seedings which resulted in slow germination and emergence. Consequently, a number of days accumulated during cool weather without a measurable effect on germination and emergence.

Emergence-silking interval

In contrast, to seeding-emergence, during this interval heat unit totals differed only 7units or 1% (Table 2) compared to 12 calender days or 18% (Table 1). This small heat unit difference was likely the result of more units being generated as temperatures rose at the later seeding dates, thereby compensating for a lack of heat units during the earlier seeding dates. Consequently, there was no difference in heat unit totals across seeding dates.

Silking-maturity interval

Calendar days differed 4 days or 7% while heat units differed 120 units or 11%. This suggests fewer heat units are needed to mature late seeded corn.

Seeding-maturity interval

Calendar days decreased 19 days or 13% while heat units decreased 164 units or 7%. These differences are likely the result of what occurred in the seeding-emergence interval discussed previously. This suggests heat units are the best method for evaluating delayed seeding from seeding to maturity.

Emergence-maturity interval

Calendar days and heat units both decreased similarly (8 days or 6% and 104 units or 5%, respectively) between seedings. It appears that both could be used to assess the effect of delayed seeding.

SUMMARY

Results suggest that you **use heat units to evaluate the pre-silking** intervals; calender days to evaluate the silking-maturity interval; heat units to evaluate the seeding-maturity interval, and **either method to evaluate the emergence-maturity** interval.

Delayed seeding affects seeding-emergence more than emergence-silking. This suggests **emergence-maturity is the best overall interval for making hybrid comparisons as seeding is delayed.**

Table 1. Calendar days needed for corn growth intervals when seeded on four dates .

Seeding Date	Growth Stage Interval				
	Seeding to Emergence	Emergence to Silking	Silking to Maturity	Seeding to Maturity	Emergence to Maturity
April 24	19	68	61	148	129
May 5	19	63	60	142	123
May 18	12	60	63	135	123
June 1	8	56	65	129	121
Early - Late Difference:					
Calendar Days	-11	-12	+5	-19	-8
%	-58	-18	+8	-13	-6

Seeding Date	Silking Date	Grain Filling Date
April 24	July 20	July 20 - September 19
May 5	July 26	July 26 - September 24
May 18	July 29	July 29 - September 30
June 1	August 4	August 4 - October 8
Difference: 38 Days	Difference: 15 Days	Difference: 19 Days

Source: Hicks, D.R. 1991 Corn growth & development. Crop News No. 94, August 1991, University of Minnesota.

Table 2. Heat unit totals (growing degree days, GDD's) during corn growth intervals when seeded on four dates.

Seeding Date	Growth Stage Interval				
	Seeding to Emergence	Emergence to Silking	Silking to Maturity	Seeding to Maturity	Emergence to Maturity
April 24	204	1147	1108	2460	2256
May 5	188	1141	1081	2409	2221
May 18	139	1136	1077	2352	2213
June 1	144	1154	988	2296	2152
Early - Late Difference:					
Heat Units	-60	+7	-120	-164	-104
%	-29	+1	-11	-7	-5

Source: Hicks, D.R. 1991 Corn growth & development. Crop News No. 94, August 1991, University of Minnesota.

This publication and others can be accessed electronically from the SDSU College of Agriculture & Biological Sciences publications page, which is at http://agbiopubs.sdstate.edu/articles/ExEx8112.pdf

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the USDA. Larry Tidemann, Director of Extension, Associate Dean, College of Agriculture & Biological Sciences, South Dakota State University, Brookings. SDSU is an Affirmative Action/Equal Opportunity Employer (Male/Female) and offers all benefits, services, and educational and employment opportunities without regard for ancestry, age, race, citizenship, color, creed, religion, gender, disability, national origin, sexual preference, or Vietnam Era veteran status.