Corn Pollination 101

Corn pollination is quickly approaching. Two weeks before, through 2 weeks after pollination, is one of the most critical times for determining yield potential.

Pollination Basics. Corn will typically shed pollen for 5 to 7 days. Silks generally emerge 1 to 2 days after pollen shed begins. Most pollination occurs in late mornings and early evenings. Pollen grains land on moist, receptive silks and within 24 hours, grow down the pollen tube to fertilize the ovule. With good environmental conditions, silks will grow around 1 to 1.5 inches a day until they are pollinated.

Factors Inhibiting Pollination. Moisture stress, high temperatures, and silk clipping by insects are the primary causes for poor pollination.

Moisture stress can reduce pollen shed to 2 or 3 days (Chart 1). Additionally, it can delay silk emergence by 4 to 5 days. This change in timing may result in not enough viable pollen being available for pollination, especially near the ear tip. Anything that inhibits roots from absorbing moisture can induce this response, including drought conditions, root feeding from insects, and compaction.

High temperatures, above 95°F, can negatively impact pollen viability. Temperatures above 90°F, in combination with moisture stress, can increase the delay of silk emergence.

Insects such as Japanese beetle and corn rootworm can feed on silks. Later planted and later silking fields are more susceptible. Generally, if silks are clipped to less than 1/2 inch before 50% pollination has occurred and beetles are present, a foliar insecticide treatment may be justified. Be sure to check requirements for treating refuges of various YieldGard® traits before making an application of foliar insecticide.

Figure 2. Example of an ear being checked for pollination progress. Kernels with silks still attached have not been pollinated.

Evaluating Pollination Progress. To check pollination progress, pull an ear and carefully remove the husks. Be mindful not to damage the silks. Once the husks are removed, gently shake the ear. Kernels that have the silk still attached, have not been pollinated (Figure 3). Pollination starts at the butt and progresses toward the tip.

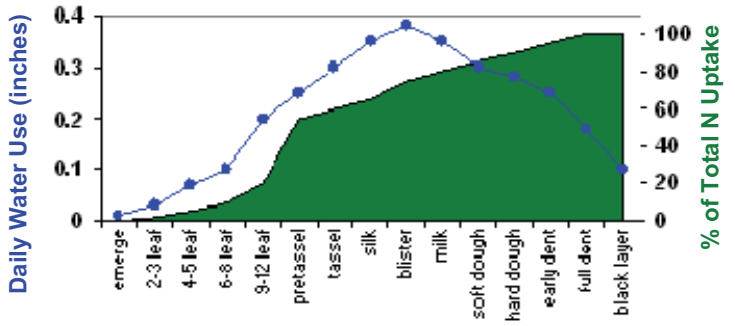
Abortion After Pollination. After pollination, typically some kernels abort at the tip of each ear. Heat and moisture stress will cause abortion to continue down the ear. Generally aborted kernels have some starch accumulated in them, causing them to have a different appearance than kernels that simply did not pollinate (Figure 4). This is important to differentiate when trying to determine the cause of kernel loss.

Management Decisions. We cannot control the weather, but there are actions that we can take to minimize the environmental risks during pollination. Scouting for silk clipping and treating appropriately is a tool that can still be implemented in 2008. For 2009, choosing hybrids with different maturities as well as multiple hybrids that require different amounts of growing degree days to reach flowering can also mitigate the risks at pollination. Reducing compaction is beneficial as well. Using YieldGard® traits that help protect against corn rootworm, or using a soil insecticide, can decrease root feeding, allowing plants to take up more moisture.

Please contact your local DEKALB® /Asgrow® Representative for additional information regarding corn pollination.

Sources: S. Brouder et al. 2005. Corn & Soybean Field Guide. Purdue University. http://www.agry.purdue.edu/dtc
S. Richie. 1993. How a corn plant develops. Iowa State Univ. Sci. and Technol. Coop. Ext. Serv. Special Report 48.

Figure 1. Comparison of daily water use (blue line) and percent of total nitrogen uptake (green area) for corn across the season.



Daily water use data adapted from R. Hoeft and others. 2000. Modern corn and soybean production. Nitrogen data adapted from "How a corn plant develops," Special Report 48, Iowa State University.

Figure 3. Corn ear with aborted kernels.

Tip kernels not pollinated.

Aborted kernels showing starch accumulation.

Normally developing kernels. Some scattered pollination can be seen as well.

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