



Determine When to Stop Corn Irrigation

Key Points

- Irrigation should continue as long as corn kernels are absorbing moisture and adding seed weight.
- As the milk line moves toward the kernel base, moisture needs decrease.
- When the black layer forms at the kernel base, that kernel has reached physiological maturity and will no longer add seed weight.
- Irrigation water applied after total black layer formation will not add to yield potential.

Corn Water Requirements

You should continue to provide irrigation water until corn kernels can no longer absorb moisture and add seed weight. Maintaining soil moisture until corn plants reach physiological maturity helps minimize plant stress and protect yield potential. By monitoring the signs of physiological maturity, you can more accurately determine when to turn off the irrigation water.

Monitor Milk Line and Black Layer

Breaking a corn cob in half allows you to observe the progress of kernel maturity. As kernels mature, a hard (dark yellow) starch layer develops at the top of the kernel, above the (dull light yellow) soft dough layer. The border between the hard and soft layers is called the milk line (Figure 1). As the milk line gradually moves to the kernel base, kernels continue to add seed weight.

At physiological maturity (R6) the hard starch layer has reached the kernel base, the abscission (black) layer has formed, and water is no longer needed for kernel growth. Kernels have reached their maximum dry weight and should have a moisture content of 28 to 35%. An easy way to confirm physiological maturity is to look for the black layer at the kernel base (Figure 2). Rub off the seed coat at the tip of a kernel and the black layer should be visible on mature kernels. Because the black layer forms from the tip of the ear (furthest from the stalk) to the base, you should always check base kernels to verify total black layer formation. Irrigation water applied after total black layer formation will not add to yield potential.

Sources:

Corn: When should irrigation of corn be terminated? 2009. Mississippi State University Cooperative and Research Extension Service. <http://msucares.com> (verified 7/22/2014); Corn: What does the milk-line look like? 2009. Mississippi State University Cooperative and Research Extension Service. www.msucares.com (verified 7/22/2014); Corn growth stage development. University of Nebraska Lincoln. WeedSOFT. Crop Growth Stage Learning Module. <http://weedsoft.unl.edu> (verified 7/22/2014).



Figure 1. The milk line marks the border between the dark yellow hard starch layer and the light yellow milky dough layer.



Figure 2. Corn kernels that have reached physiological maturity form a black layer at the kernel tips.

Table 1. Corn Growth Stages

R1	Silking - (silk visible outside the husk) pollen grains fall onto the silk to fertilize the ovule
R2	Blister - (10-14 days after silking) white kernels resemble a blister in shape
R3	Milk - (18-22 days after silking) yellow kernels on the outside with a milky white fluid inside the kernel
R4	Dough - (24-28 days after silking) liquid inside kernel thickens to a pasty consistency, cob remains white
R5	Dent - (35-42 days after silking) kernels begin to dent
R6	Physiological Maturity - (55-65 days after silking) kernels have reached maximum dry weight, black layer has formed where kernel attaches to the cob

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