



# AGRONOMIC

## Spotlight



### When to Terminate Irrigation for Corn Production

In corn production, one of the most important factors for achieving optimum plant growth and yield potential is moisture. Maintaining adequate moisture can prove to be difficult in many Southern regions where a warm, dry climate can persist during the growing season. Proper irrigation management can increase and stabilize crop yields from year-to-year, as opposed to the unpredictability of dry land acres.

As commodity prices reach record highs, corn acres are more valuable than ever. As a result of the high commodity prices many input costs have also risen, in return making a successful harvest important for producers. Irrigating crops is an added production expense that can significantly increase corn yield and insure against drought losses when implemented correctly. Supplying water until a crop reaches maturity will help maximize yield potential, however continuing irrigation after physiological maturity occurs is simply an added expense since no additional yield will be realized. The following provides tips for determining when to terminate irrigation for corn production.

#### Terminating Irrigation on Corn Production

For optimum corn yields, moisture should be available to corn plants until physiological maturity is reached. While water requirements decrease as the plant gets closer to maturity it is still important to maintain proper soil moisture to minimize stress and

maximize yields. For corn, physiological maturity occurs when the abscission layer, commonly known as the black layer, forms at the base of the corn kernels. Corn kernels will continue to accumulate seed weight until the black layer forms.

The maturing process begins as the hard starch layer starts to develop at the top of the kernel and continues to accumulate towards the base. The borderline separating the hard starch layer and the dough layer is referred to as the milk-line. The progression of the milk-line can be monitored by breaking a corn cob in half and observing the flat side of the corn kernel. The milk-line is the line separating the darker yellow hard starch layer from the dull light yellow soft dough layer.

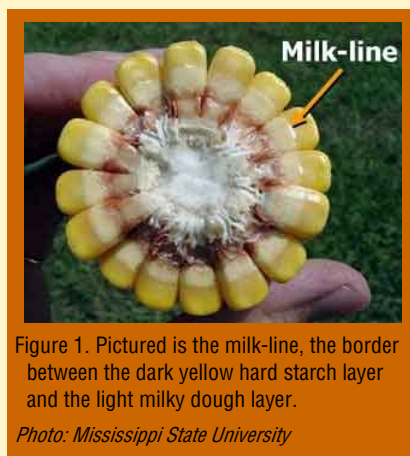


Figure 1. Pictured is the milk-line, the border between the dark yellow hard starch layer and the light milky dough layer.

Photo: Mississippi State University

at complete physiological maturity (R6) the hard starch has

Corn Growth Stages	
R1	<b>Silking</b> —(silk is visible outside the husk) pollen grains fall onto the silk to fertilize the ovule
R2	<b>Blister</b> —(10-14 days after silking) kernels are white in color and resemble a blister in shape
R3	<b>Milk</b> —(18-22 days after silking) kernel is yellow on the outside with a milky white fluid inside
R4	<b>Dough</b> —(24-28 days after silking) liquid inside kernel thickens to a pasty consistency, cob is white
R5	<b>Dent</b> —(35-42 days after silking) kernels are dented or denting and cob has turned red in color
R6	<b>Physiological Maturity</b> —(55-65 days after silking) kernels have reached maximum dry weight, black layer has formed where kernel attaches to cob

Figure 1. Corn Growth Stage Development. WeedSOFT.

reached the kernel base, the abscission layer has formed and water is no longer needed for kernel development. At this point kernels have attained their maximum dry weight with a moisture content at 28 to 35 percent. To confirm black layer, the seed coat at the tip of the kernel can be rubbed off. The black layer should be visible at the kernel base on the opposite side of the embryo.

Black layer formation occurs progressively from the tip (furthest from the stalk) of the ear to the base (closest to the stalk). To verify total black layer formation always check base kernels.

**Sources:** *Corn: When Should Irrigation of Corn be Terminated?* Mississippi State University Cooperative and Research Extension Service. Oct 16, 2007. <http://msucares.com/crops/coen/corn7.html>

*Corn: What does the Milk-line Look Like?* Mississippi State University. [www.msucares.com/crops/corn/images/milklinehalf.jpg](http://www.msucares.com/crops/corn/images/milklinehalf.jpg)

Hill, J. H. *How a Corn Plant Develops - Reproductive Stages and Kernel Development.* Iowa State University Extension. May 29, 2008 <http://www.extension.iastate.edu/hancock/info/Corn+Develop+Repro+Stages.htm>

*Corn Growth Stage Development.* University of Nebraska Lincoln. WeedSOFT. *Crop Growth Stage Learning Module.* <http://weedsoft.unl.edu/documents/GrowthStagesModule/Corn/Corn.htm#>

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