



REPRODUCTIVE (R) GROWTH STAGES

Corn development is categorized into vegetative and reproductive stages. Reproductive growth refers to all development that determines kernel number and size. The reproductive stage is broken down into subdivisions, identified numerically.



R1: SILKING

This stage is defined once 50% of the plants in a field have one or more silks visible outside the husk leaves. Pollen shed may have already begun just prior to silk emergence or will begin at this stage. As a result, R1 is the point where both pollination and fertilization occur, making it a very vulnerable stage to losses. Stress at this stage can significantly impact yield. R1 lasts approximately 10 – 12 days.



R2: BLISTER

Blister stage refers to the appearance of the newly fertilized kernels due to their high water content. Dry matter accumulation is minimal during the 8 – 10 day duration of R2. Kernel moisture is about 85% at onset.



R3: MILK

R3 is generally identified by the yellow colour of kernels and high moisture content. When pressure is applied to kernels at this stage, they burst easily and are filled with thin milky liquid, though starch accumulation is rapid at this point. Kernel moisture is approximately 80% at the beginning of the milk stage. R3 is about 6 – 8 days in length.



R4: DOUGH

Starch accumulation in the endosperm has caused the milky inner fluid to thicken to a paste and kernels begin to dent slightly, starting at the base of the ear. Kernel moisture has decreased to about 70% at the beginning of R4 and kernels have accumulated almost half of their dry matter weight. Dough stage can last from 7 – 10 days.





R5: DENT

Dent stage is visually identified by the indentation of most kernels, due to the declining moisture content (about 60% at the start of R5), relative to higher starch content. Milk line is visible near the top of the kernels, marking the boundary between the milky and starchy areas of the maturing grain.

R5 is subdivided into four parts (R5.0, R5.25, R5.5, R5.75), according to milk line. Progression times between each quarter varies with air temperature, moisture availability and hybrid. The following table is a general guideline that helps estimate when physiological maturity will occur.

PROGRESSION OF MILK LINE DURING R5

R Stage	Moisture	Dry Matter (% of total dry weight)	Average per Substage	
			Growing Degree Days °F	Days
5.0	60	45	75	3
5.25 (1/4 milk line)	52	65	120	6
5.5 (1/2 milk line)	40	90	175	10
5.75 (3/4 milk line)	37	97	205	14
6.0 (Physiological maturity)	35	100		

Abendroth, L.J., R.W. Elmore, M.J. Boyer, and S.K. Marlay. 2011. Corn growth and development. PMR 1009. Iowa State University Extension, Ames, Iowa.



R6: PHYSIOLOGICAL MATURITY

Approximately 32 – 35 days after the onset of R5, all kernels have reached their maximum dry weight and the black layer is visible at the base of each kernel. Moisture content of the grain is 31 – 35%, depending on environment and hybrid genetics. Black layer formation can occur at higher moisture content if kernel development is halted due to frost or disease. Black layer and physiological maturity are not the same thing, however, are used interchangeably because physiological maturity is not identifiable by visually inspecting the grain.

The crop is not ready for harvest yet. Grain moisture decreases at a rate of about 0.5 to 0.75% per day in good drying conditions, following R6. Slow drydown is a result of low corn heat unit (CHU) accumulation, mainly an effect of declining daytime and nighttime temperatures in the fall. Desirable moisture content of grain for harvest is about 20 – 27%.



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