ANR-0148

A Guide to Corn Growth and Development

ANR-0148-Table 1. Key vegetative and reproductive stages for corn, from emergence (VE) to physiological maturity (R6). A brief description is included for each stage.

Growth Stage*		Description
VE	emergence	Coleoptile emerges through the soil surface; seminal roots are established.
V3	3-leaf collar	The growing point is below the soil surface; nodal roots are forming.
V6	6-leaf collar	The growing point is at or above the soil surface. The primary ear shoot and tassel are initiated. The number of kernel rows in the ear is determined during V6–V8. The nodal roots are now dominant.
V9	9-leaf collar	Rapid growth is underway; brace roots may be present at the soil surface.
V12	12-leaf collar	The lower 3–4 leaves may be absent due to stalk expansion and leaf senescence.
V15	15-leaf collar	The potential kernel number per row is determined.
V18	18-leaf collar	Progression of silk elongation is most prominent on the uppermost ear.
V19	19-leaf collar	Tassels can be visible, increasing in size, but not fully extended yet.
VT	tasseling	The last tassel branch is visible; pollen may be shed on the main branch of the tassel before all branches are fully extended. A corn plant can release about ½ million or more pollen grains per day.
R1	silking	One or more silks are extending outside husk leaves; silks may be visible before the tassel is completely extended. Silks are receptive to pollen for about 10 days.
R2	blister	The outside of the kernel is ivory-colored, and the kernel contents are clear. This occurs about 10–14 days after R1. Stress conditions, including drought, can cause kernels to abort at R2–R3. Kernel size is being determined. The embryo is growing (not distinguishable without magnification).
R3	milk	Kernels have a “milky” interior. This is often called the “roasting ear” stage; the external kernel color changes from white/clear to orange/yellow. It occurs about 18/22 days after R1. Kernel size is being determined, and embryo and endosperm are now distinguishable.
R4	dough	Kernel content has a “pasty” and “doughy” consistency from starch accumulation. It occurs about 24–28 days after R1. Risk of kernel abortion from stress is low at this point, although stress can reduce kernel weight.
R5	dent	It occurs about 35–42 days after R1. Starches are accumulating, and kernel moisture is rapidly declining. Stress can reduce kernel weight. Sever stress can cause premature kernel black-layer formation.
R6	physiological maturity	It occurs about 55–65 days after R1. Physiological maturity is complete. Kernels have achieved their maximum dry weight and are safe from frost. Kernel moisture averages 30% but can range from 25% to 40% grain moisture.

*Following the leaf collar method detailed in Abendroth et al. (2011). *Corn Growth and Development.* PMR 1009 Iowa State University, Ames, IA.