

How a corn plant develops: Reproduction through maturity

R1 stage: Silking

The R1 stage begins when silk is visible outside the husks. Pollination occurs when these moist silks catch falling pollen grains. Pollen takes about 24 hours to move down the silk to the ovule where fertilization occurs. The ovule becomes a kernel. Generally, all silks on an ear are pollinated in two to three days. The silks grow 1.0 to 1.5 inches each day until fertilized. The R1 kernel is almost engulfed in cob materials and is white on the outside. The inner material is clear with little fluid present.

R2 stage: Blister (10-14 days after silking)

R2 kernels are white on the outside and resemble a blister. The endosperm and its now-abundant inner fluid are clear. The embryo is still developing, but it now contains a developing miniature corn plant. Much of the kernel has grown out from the surrounding cob materials. The cob is close to full size. Silks are darkening and beginning to dry out. Starch has just begun to accumulate in the watery endosperm. Kernels are beginning to accumulate dry matter. Seed-fill is beginning.

R3 stage: Milk (18-22 days after silking)

The R3 kernel is yellow outside, while the inner fluid is now milky white due to accumulating starch. The embryo is growing rapidly. Most of the R3 kernel has grown out from the surrounding cob. Silks are brown and dry or becoming dry.

R4 stage: Dough (24-28 days after silking)

Continued starch accumulation in the endosperm causes the milky inner fluid to thicken to a pasty consistency. Usually four embryonic leaves have formed as the embryo has grown dramatically from the R3 stage. The shelled cob is a light red to pink. Toward the middle of R4, the embryo will stretch across more than half of the width of the kernel side. Just before R5, kernels along the length of the ear begin to dent or dry. The fifth (last) embryonic leaf and the lateral seminal roots have formed. If this seed is planted, these five embryonic leaves will appear the following season after germination and VE.

R5 stage: Dent (35-42 days after silking)

At R5, all or nearly all kernels are dented or denting. The shelled cob is dark red. The kernels are drying down from the top, where a small hard layer of starch is forming. This starch layer appears shortly after denting as a line across the back of the kernel (the non-embryo side). With maturity, the hard starch layer and line will advance toward the cob. Accumulated starch is hard above the line but still soft below the line.

R6 stage: Physiological maturity (55-65 days after silking)

By the R6 stage, kernels have attained their maximum dry weight or dry matter accumulation. The hard starch layer has advanced completely to the cob. A black or brown abscission layer forms, moving progressively from the tip ear kernels to the basal kernels of the ear. It's a good indication of physiological maturity and signals the end of kernel growth. The husks and many leaves are no longer green, although the stalk may be.

