

How a corn plant develops: Growth and development through the vegetative stages

All corn follows a similar pattern of development with variations based on hybrids, seasons, planting dates and locations. This illustration shows the key phases of corn development through the vegetative (V) stages.

Germination and emergence (VE)

Once planted, corn seeds absorb water from the soil and begin to grow. VE (emergence) comes when the coleoptile (spike) pushes through the soil surface. Corn plants can emerge within five days in ideal heat and moisture conditions. But under cool and wet – or even under very dry conditions – they can take more than two weeks to emerge. The growing point (stem apex) is 1 to 1.5 inches below the surface. The seminal root system is growing from the seed. The seminal roots do much of the early work, but growth slows after VE as nodal roots begin to grow.

V3 Stage

At V3, the growing point is still below the surface. The stalk (stem) hasn't elongated much. Root hairs are growing from the nodal roots as seminal roots cease growing. All leaves and ear shoots the plant will ever produce form from V3 to about V5. A tiny tassel forms at the tip of the growing point. Above-ground plant height typically is about 8 inches.

V6 Stage

The growing point and tassel rise above the soil surface at about the V6 stage. The stalk begins to elongate. The nodal root system grows from the three to four lowest stalk nodes. Some ear shoots or tillers are visible. Tiller (or sucker) development depends on the specific hybrid, plant density, fertility and other conditions.

V9 Stage

Dissection of a V9 plant shows many ear shoots (potential ears). These develop from every above-ground node except the last six to eight nodes below the tassel. Lower ear shoots grow fast at first, but only the upper one or two develop a harvestable ear. The tassel begins to develop rapidly. Stalks lengthen as the internodes grow. By V10, the time between new leaf stages shortens to about every two to three days.

V12 Stage

The number of ovules (potential kernels) on each ear and the size of the ear are determined at the V12 stage. The number of kernels per row isn't determined until about a week before silking, at about V17. The top ear shoot is still smaller than the lower ear shoots, but many of the upper ears are close to the same size.

V15 Stage

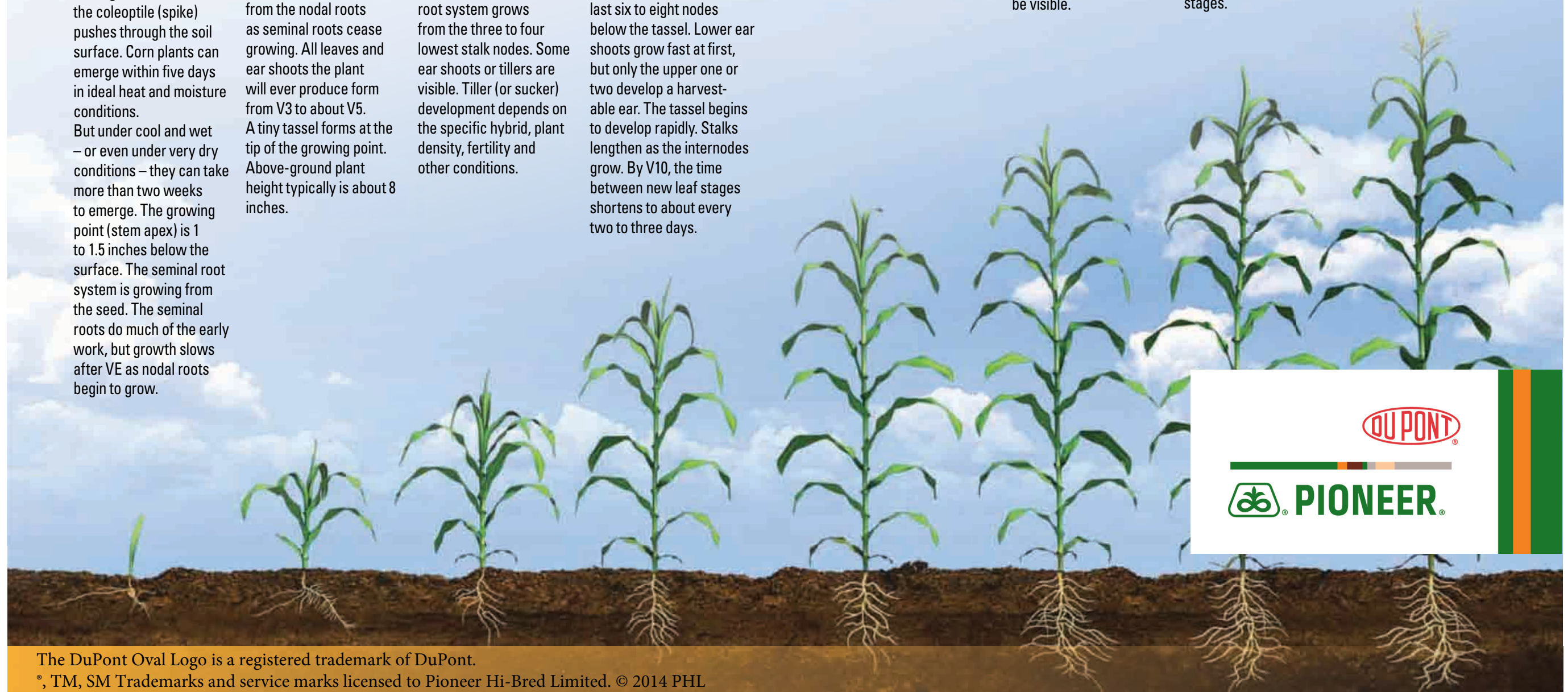
This is the start of the most crucial period for determining grain yield. Upper ear shoot development overshadows lower ear shoot development. Every one to two days, a new leaf stage occurs. Silks begin to grow from the upper ears. By V17, the tips of upper ear shoots may be visible atop the leaf sheaths. The tip of the tassel also may be visible.

V18 Stage

Silks from the basal ear ovules elongate first. Silks from the ear tip ovules follow. This illustration represents about eight to nine days of reproductive organ development. Brace roots (aerial nodal roots) grow from the nodes above the soil surface to help support the plant and take in water and nutrients during the reproductive stages.

VT Stage

The VT stage arrives when the last branch of the tassel is completely visible. VT begins about two to three days before silk emergence. The plant is nearly at its full height. Pollen shed begins, lasting one to two weeks. The time between VT and R1 can fluctuate considerably depending on the hybrid and the environment.



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