

CORN DEVELOPMENT AND KEY GROWTH STAGES

Revised March, 2010

Brent Bean, Texas AgriLife Extension Agronomist

Vegetative Stage

- Emergence • Coleoptile leaf (1st leaf) visible. This leaf will be shorter than later emerging leaves and has a rounded tip.
- Growing point of the plant should be 1 to 1.75 inches below the soil surface. Permanent (nodal) root system will begin developing at this point. If seed is planted too shallow the root system will have a difficult time becoming established.
- 2-Leaf • Collar of the 1st true leaf (not the coleoptile leaf) is visible. Plant is still relying primarily on seed reserves for survival.
- 3-Leaf • Collar of third leaf visible. Occurs approximately 10 to 14 days after emergence.
- Photosynthesis now very active and supporting the plant.
 - May apply 2,4-D or dicamba from emergence through the 5th leaf stage without drop nozzles.
 - Begin checking roots for Western corn rootworm larvae (white). Watch corn that is next to wheat or grass for Banks grass mites infesting lower surface of leaves.
- 4-Leaf • Collar of 4th leaf visible.
- 5-Leaf • Collar of 5th leaf visible. May have lost the coleoptile leaf by this time.
- Plant is approximately 8 inches tall. Growing point is just below the ground surface. A hail or light freeze will cause little long term damage to the plant. However, flooding while the growing point is below ground can kill the plant, especially if temperatures are high.
 - The first internode to elongate is about 13 mmh long and is located just below the node to which leaf 5 is connected. This is an important reference for crop growth staging.
 - Tassel formation has been initiated.

- 6-Leaf
 - Collar of 6th leaf visible. Occurs approximately 30 days after emergence.
 - Growing point and tassel above soil surface making the plant more vulnerable to a hail or freeze.
 - Permanent root system rather than the seminal roots is now the primary root system supporting the plant.
 - Tillers may begin developing at this stage.
 - Continue to check roots for Western corn rootworm larvae. Continue to check for small colonies of Banks grass mite.
- 7-Leaf
 - Collar of 7th leaf visible. Plant beginning to grow rapidly.
- 8-Leaf
 - Collar of 8th leaf visible. Occurs approximately 45 days after emergence May have lost lower two leaves.
 - Don't sidedress after this point or root damage may occur.
 - Check upper and lower surfaces of leaves for Southwestern and European corn borer eggs or small larvae.
 - No longer advisable to apply insecticide for Western corn rootworm control.
- 9-Leaf
 - Collar of 9th leaf visible. Ear shoots are visible in the leaf collar regions. May have up to 8 ear shoots.
 - Tassel is rapidly developing.
 - Corn borer feeding damage should be evident on leaves and in whorl of infested plants.
- 10-Leaf
 - Collar of 10th leaf visible. New leaf stage occurring every 3 to 4 days.
 - Continue to check for Banks grass mite infestations on lower leaves.
- 11-Leaf
 - Collar of 11th leaf visible. May have lost lower three leaves.
 - A few corn borers will have entered stalk by this time. No longer feasible to apply insecticides for corn borer control.
- 12-Leaf
 - Collar of 12th leaf visible. Potential number of kernels on each ear and size of ear being determined, this continues until about 1 week prior to silking.
 - Number of kernel rows already determined. Top ear is still smaller than lower ear shoots.

- Brace roots just beginning to develop.
 - Adequate moisture and nutrients are critical during this time.
- 13-17
Leaves
- Leaf stages 13 to 17 will develop very rapidly. At some point the tip of the tassel will be visible. At which leaf stage this occurs will vary between hybrids. Silks will begin to grow as tassel is emerging. Brace roots are now growing.
 - Early maturing hybrids progress from the 13-leaf stage through the 17-leaf stage faster than later maturing hybrids and have smaller ears. This can be compensated by higher seeding rate.
 - Attempts should be made to have the soil profile full of water prior to tassel emergence.

- Tassel
- Tassel fully emerged. Beginning of a 4 week period that is very critical. Plant is almost at full height. Corn is very vulnerable to hail since tassel is fully exposed. Silking will generally begin in 2 to 3 days. Stress occurring a few days prior to tasseling can cause ear development to slow resulting in a lag between pollen shed and silking. This can lead to barren ears.
 - Begin to check for 2nd generation corn borer egg lay on leaves.

Reproductive Stage

- Silking
- Silks visible outside the husks. Most critical stage in the development of the corn plant.
 - Takes 24 hours for pollen grain to grow down the silk and fertilize the egg. Generally 2 to 3 days required for all silks to be fertilized on a single ear.
 - Number of eggs that are successfully fertilized will determine the number of kernels that develop on the ear.
 - Corn earworm moths may be laying eggs on silk.
 - Banks grass mite population may begin to rapidly increase.
- Blister
- Blister stage occurs 10 to 14 days after silking. Kernels are small and watery.
 - Continue to check for Banks grass mite.
- Milk
- Milk stage occurs 18 to 22 days after silking. The kernel is a yellow color on the outside with a milky fluid inside. Stress at this stage will greatly affect yield.
 - Corn borer and mites may reach economic thresholds.

- Dough
- Dough stage occurs 24 to 28 days after silking. The inside of kernels have a pasty consistency.
- Dent
- All kernels dented. Dent stage generally occurs 35 to 42 days after silking.
 - Cob is a dark red color on the majority of hybrids.
 - Stress at this time will reduce kernel weight but not number. Early frost will stop grain fill. Frost damaged corn is slow to dry, thus delaying harvest.
- ½ Maturity
- As the kernels are drying down a hard white layer of starch will begin to form beginning at the top of the kernel and progressing to the cob. When this hard layer reaches half way down the kernel it is considered to be at the ½ maturity stage. If the soil profile is full of water at this point no more additional irrigation may be required.
- Black Layer
- Black layer stage occurs when the starch line has progressed to the base of the kernel. This can be identified by slicing the kernel and observing the black line that occurs at the kernel base. Maximum dry matter has now accumulated in the kernel.
 - Moisture content is approximately 30 to 35 percent at black layer formation.