



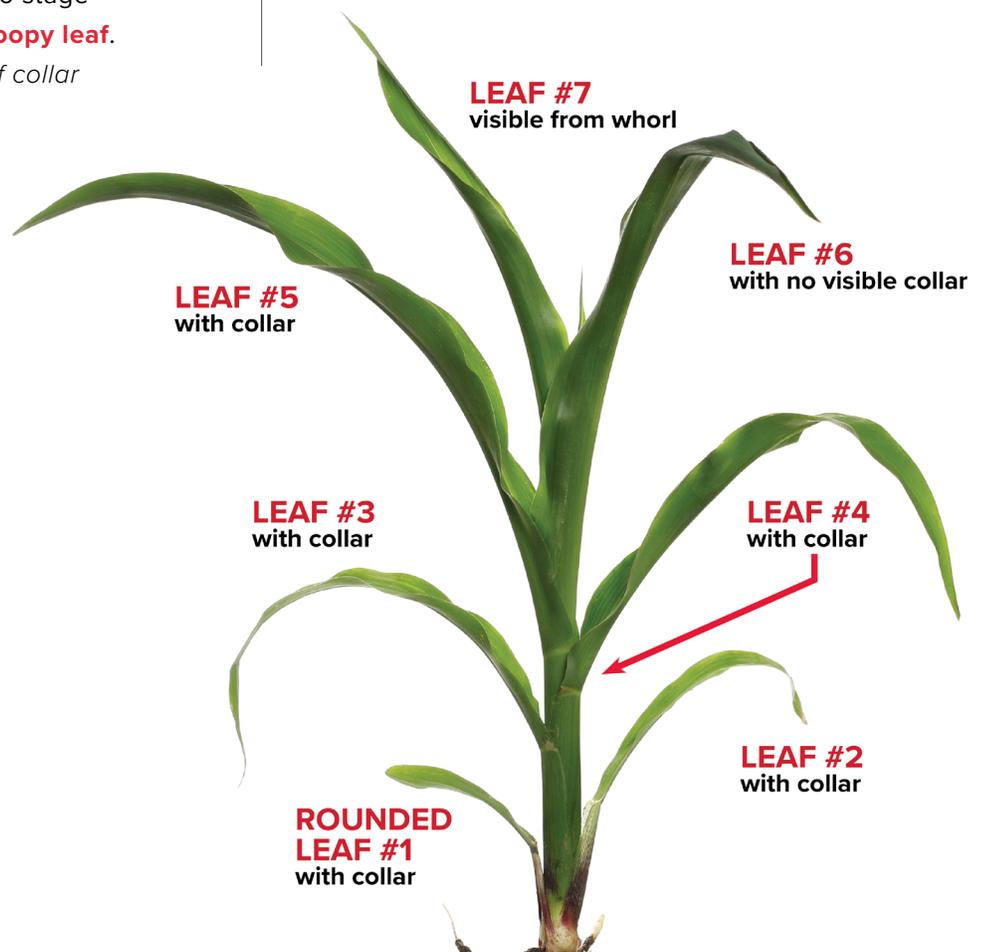
CORN SCOUTING GUIDE

Scouting crops is important not only for identifying and remedying any threats, but also for identifying the plant's growth stage. Stage identification helps farmers know what's going on developmentally and what they should be doing from a management standpoint, whether that's applying fertilizer, spraying pesticides or helping the crop live up to its potential. Crop stage can also help a farmer identify when certain diseases, pests or nutrient deficiencies are likely to appear.

There are two methods used to stage corn plants: **leaf collar** and **droopy leaf**. *This guide is based on the leaf collar method, which counts the number of leaves on a plant that have visible collars, starting with the rounded "thumb-shaped" leaf near the bottom of the plant. From there, each vegetative stage is determined and labeled (e.g., V1, V2, V3, etc.) by counting visible collars until the tassel emerges.*

QUICK LINKS

- + VEGETATIVE STAGES
- + REPRODUCTIVE STAGES
- + DISEASE/INSECT SCOUTING CALENDAR



VEGETATIVE STAGES

Pre-emergence

As the corn kernel germinates, the first root (the radicle) extends from the tip end of the seed.

VULNERABILITIES

Fertilizer burn, and prolonged exposure to cold rain, snow melt or soil temperatures below 50 degrees Fahrenheit

+

Wait for soil temperatures to climb above minimum thresholds, and make sure to place seed 1.5 inches to 2.0 inches deep.

MANAGEMENT TIP

VE (Emergence) | 100-120 GDUs*

The corn spike, known as the coleoptile, pushes through the soil surface roughly a week after planting (though emergence can range from four days to several weeks after planting). Within the coleoptile are the first five sets of corn leaves. When the coleoptile meets sunlight, it opens/splits. The corn plant's growing point, also known as the crown, is roughly 1.0 inch to 1.5 inches below the surface.

DISEASE

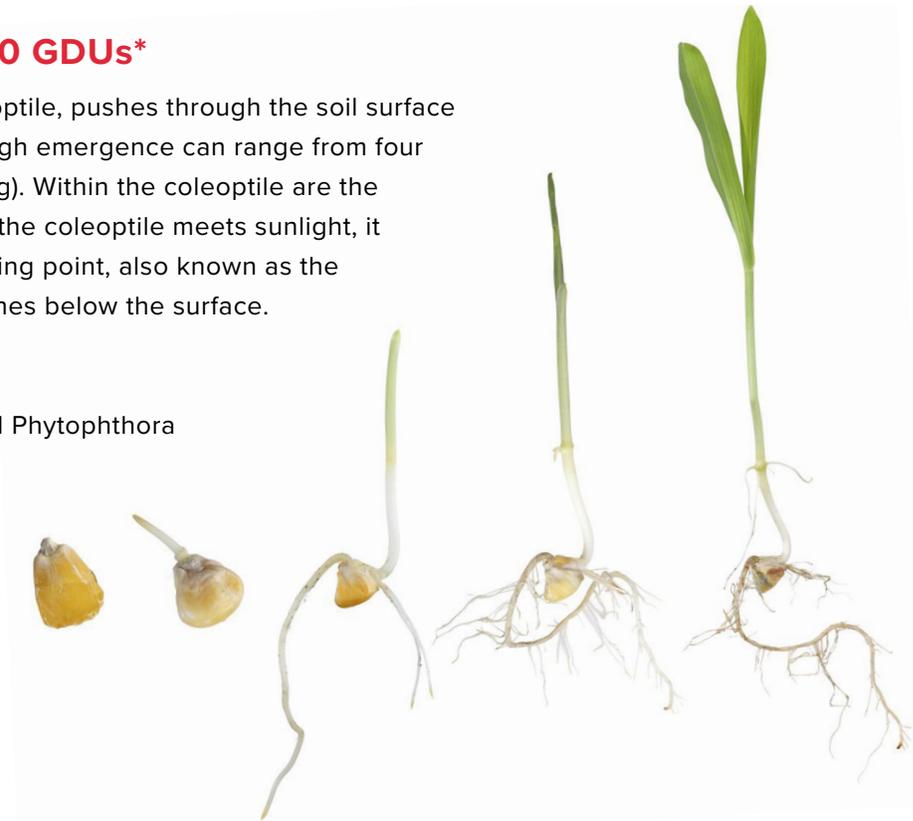
Pythium, Rhizoctonia, Fusarium and Phytophthora

INSECTS

Black cutworm, white grub, seed corn beetles, wireworms

OTHER VULNERABILITIES

Cloddy soil, soil crusting, chemical injury, a hard freeze



MANAGEMENT TIP

+

Take population estimates, making note of abnormal germination, runts, planting depth, and any emergence or planter issues. Noting issues can help you improve next season.

V1 (First Leaf) to V2 (Second Leaf) | 155-200 GDUs

Roughly three to four days after emergence, the first leaf emerges and the leaf collar is visible. That V1 leaf typically has a more rounded tip than subsequent leaves. During this period, the seminal root system continues to grow, and the initial bumps of the nodal root system may be visible. The growing point remains below the surface, which means the plant can be cut off or hailed upon with little lasting impact.

DISEASE

Pythium, Rhizoctonia, Fusarium and Phytophthora

INSECTS

Black cutworm, white grub, seed corn beetles, wireworms

OTHER VULNERABILITIES

Weeds, nutrient deficiencies causing purpling, yellowing or striping

+ Scout fields soon after emergence, keeping in mind your field's history and likely threats for a given season. Early season pest damage like that from black cutworm may not be evident from the road.

MANAGEMENT TIP

V3 | 350 GDUs

The seed is no longer the corn plant's main food source. The plant begins to rely on its nodal root system roughly 10 to 20 days after emergence, launching its photosynthetic process. The corn plant's above-ground height is typically around 8 inches, and its growing point remains below the surface where root hairs are growing.

DISEASE

Pythium, Rhizoctonia, Fusarium and Phytophthora

INSECTS

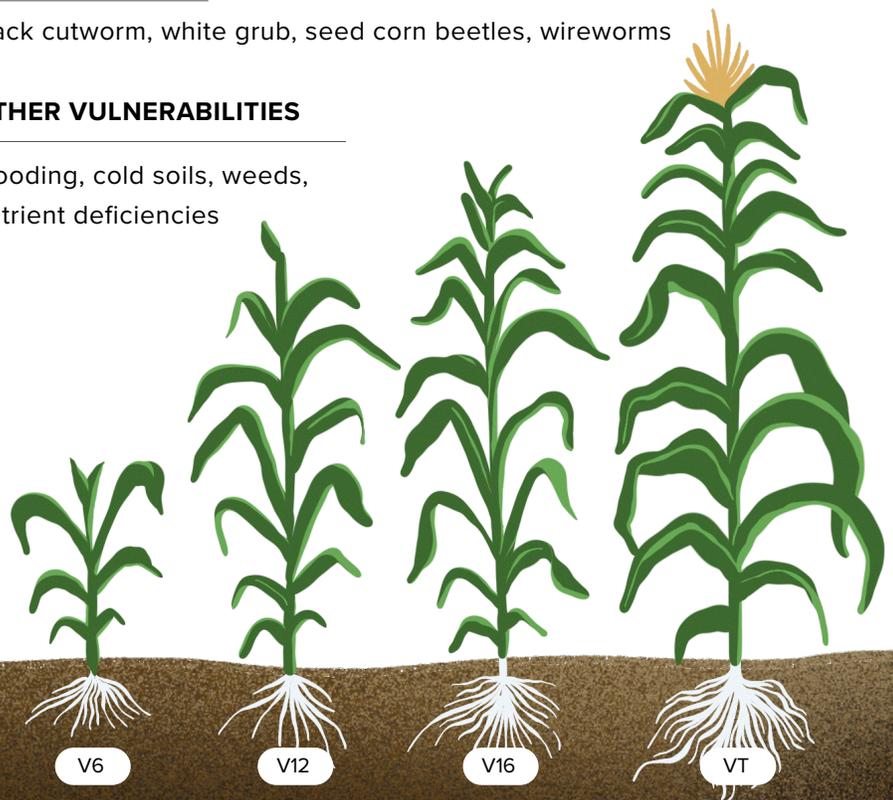
Black cutworm, white grub, seed corn beetles, wireworms

OTHER VULNERABILITIES

Flooding, cold soils, weeds, nutrient deficiencies

+ Weeds compete with your corn crop for light, water and nutrients. Keep your fields clean.

MANAGEMENT TIP



SEED

VE

V1

V2

V6

V12

V16

VT

V4 to V5 | 400-450 GDUs

Roots are elongating and the growing point is nearing the surface, limiting the impact of hail, wind, frost or cut off plants. The tassel has started to form.

DISEASE

Eyespot, Stewart’s leaf blight, Goss’s Wilt, common rust

INSECTS

Corn rootworm, European corn borer

OTHER VULNERABILITIES

Flooding, weed competition, nutrient deficiencies



Herbicides can be applied during these stages, so make sure to note weed height and coverage when scouting fields.

MANAGEMENT TIP

V6 | 475 GDUs

The crown, or growing point, reaches the soil surface. The stalk begins to elongate and ear shoots are visible. Potential kernel rows are being determined. This is a critical period when nitrogen uptake begins.

DISEASE

Goss’s Wilt, Stewart’s leaf blight, common rust, gray leaf spot, northern leaf blight, eyespot

INSECTS

Corn rootworm, European corn borer, common stalk borer, fall armyworm, southwestern corn borer, corn leaf aphid

OTHER VULNERABILITIES

Nutrient deficiencies, hail, freeze, flooding



Be on watch for nutrient deficiencies during this timeframe and take steps to correct them. This is an optimal time to side-dress nitrogen.

MANAGEMENT TIP

V7 to V9 | 610 GDUs at V8

This is a period of rapid growth, with stalks lengthening, tassels quickly developing and plants showing ear shoots. The number of kernel rows will be set by V8 and the process of determining potential kernels per row begins. During this period of rapid development, the lower leaves may die if a plant is stressed. The plant will likely be around 2 feet tall.

DISEASE

Stewart’s leaf blight, Goss’s Wilt, common rust, gray leaf spot, northern leaf blight, eyespot

INSECTS

Common stalk borer, corn rootworm, European corn borer, fall armyworm, southwestern corn borer, corn leaf aphids, Japanese beetles

OTHER VULNERABILITIES

Nutrient deficiencies



Side-dressing nitrogen is a great option for getting plants this key nutrient as the plant needs it, but farmers should be aware that doing so after V8 can damage roots.

MANAGEMENT TIP

V10+ | 740+ GDUs

The period from V10 forward is one of rapid growth and dry matter accumulation. The cornstalk elongates, and tassel grows quickly. The plant’s moisture and nutrient requirements are high during the V10-V15 period. Potential kernels per row are determined in the V12 to V15 stages. Silks begin to grow from the upper ears. Ear development is rapid from V16 to V18. By V17, the tips of the upper ear shoots may be visible atop leaf sheafs, along with the tip of the tassel. Brace roots grow from the nodes above the soil surface to support the plant and take in water and nutrients. Most hybrids grown in the Corn Belt will have 19-20 leaves prior to tassel.

DISEASE

Goss’s Wilt, gray leaf spot, eyespot, southern corn rust, Stewart’s leaf blight, common rust, northern leaf blight, Fusarium stock rot, Gibberella stalk rot

INSECTS

Corn rootworm, European corn borer, fall armyworm, southwestern corn borer, corn leaf aphids, Japanese beetles

OTHER VULNERABILITIES

Nutrient or moisture deficiencies from the V10 to V15 stages can slash kernel numbers and ear size. Hot, dry conditions are especially detrimental from V16 to V18. Hail and greensnap are also threats.

+ Anything you can do to reduce plant stress and allow for adequate nutrient levels can help maximize yield potential, as the plant is utilizing major amounts of nitrogen, phosphorous and potassium during these stages.

MANAGEMENT TIP

VT (Tasseling) | 1,135 GDUs

The last branch of the tassel is completely visible, extended outward and not held in by the upper leaves. Silks will emerge in two or three days. The corn plant is at full height and all leaves have emerged.

DISEASE

Goss’s Wilt, tar spot, northern leaf blight, gray leaf spot, eyespot

INSECTS

Corn rootworm, corn earworm, Japanese beetles, European corn borer

OTHER VULNERABILITIES

Hail, drought, heat

+ If you are using fungicides, your first application should be around the time the crop is tasseling.

MANAGEMENT TIP

NEXT: REPRODUCTIVE STAGES

REPRODUCTIVE STAGES

R1 (Silking) | 1,400 GDUs

Silks emerge two to three days after tassels, and fields generally shed pollen in the morning and evening for around a week. That pollen shed is a major determinant for whether potential kernels are fertilized, and hot, dry conditions reduce fertilization. Nitrogen and phosphorous uptake are rapid.

DISEASE

Eyespot, gray leaf spot, northern leaf blight, southern leaf blight, tar spot, Goss's Wilt

INSECTS

Corn earworm, corn rootworm, European corn borer, Japanese beetles, western bean cutworm

OTHER VULNERABILITIES

Hail, dryness, heat

+

Be especially vigilant in scouting for disease and insect damage from VT through the reproductive stages. Loss of leaves and damage to silks during these stages will clip yields.

MANAGEMENT TIP

R2 (Blister) | 1,660 GDUs

White, blister-like kernels form on the cob roughly 10 to 14 days after silking, and starch begins to accumulate. Silks darken and dry out. Drought stress at this stage can result in aborted kernels.

DISEASE

Eyespot, Goss's Wilt, common rust, gray leaf spot, northern leaf blight, Fusarium stalk rot, Gibberella stalk rot, tar spot

INSECTS

European corn borer, southwestern corn borer, Japanese beetles, western bean cutworm, corn earworm

OTHER VULNERABILITIES

Drought stress

+

Additional water at or after this stage won't improve yield; in fact, it can slow dry down and may encourage stalk or grain diseases.

MANAGEMENT TIP



R3 (Milk) | 1,775 GDUs

Kernels are yellow and filled with white, milky liquid, while the silks of the corn ear are dry and brown. Dry matter is rapidly accumulating.

DISEASE

Goss’s Wilt, tar spot, gray leaf spot, northern leaf blight, Fusarium stalk or ear rot, Gibberella stalk or ear rot, anthracnose top dieback, Diplodia ear rot, common rust, eyespot

INSECTS

European corn borer, southwestern corn borer, Japanese beetles, western bean cutworm, corn earworm, corn rootworm

OTHER VULNERABILITIES

Heat or drought stress

+ Limit drought stress, as this can lead to small, shallow kernels, tip back, lodging or stalk cannibalization.

MANAGEMENT TIP

R4 (Dough) | 1,925 GDUs

Inner kernel fluid begins to thicken as starch accumulates. At this point, kernels have obtained around half their total dry weight, and they are becoming more yellow and consistent in terms of size. Stress during this stage will affect kernel weight.

DISEASE

Goss’s Wilt, Fusarium stalk or ear rot, Gibberella stalk or ear rot, anthracnose top dieback, Diplodia ear rot

INSECTS

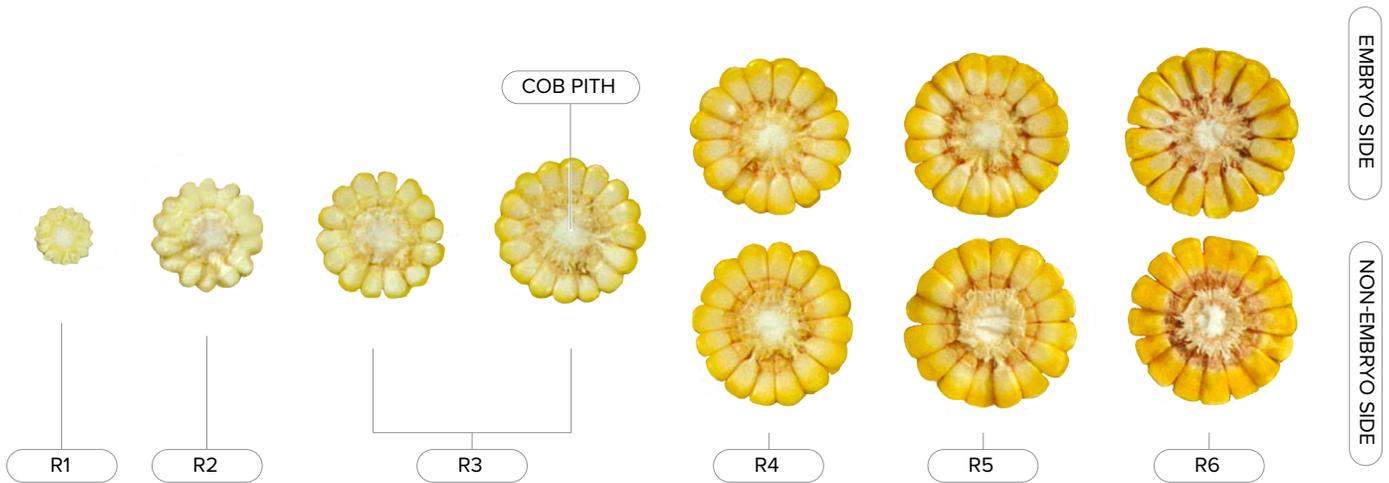
European corn borer, southwestern corn borer, Japanese beetles, western bean cutworm, corn earworm

OTHER VULNERABILITIES

Environmental stress, particularly drought; nutrient deficiencies

+ Assessing late-season intactness, plant health and harvestability, including use of a simple push or squeeze test, can help you prioritize fields and can inform hybrid selections for the following season.

MANAGEMENT TIP



R5 (Dent) | 2,450 GDUs

Kernels begin to dry down and harden from the top of the kernel toward the cob, resulting in a dent on the top of each kernel and the retreat of the milk line toward the kernel tip. Kernels will continue to fill and add weight for another 20 days. Frost during this stage can result in premature black layer, lowering test weights and slowing dry down. Conversely, overly hot, dry weather during this stage can cut yields.

DISEASE

Goss's Wilt, anthracnose top dieback, Diplodia ear rot, Fusarium ear rot, Gibberella ear rot

INSECTS

European corn borer, southwestern corn borer

OTHER VULNERABILITIES

Frost, heat, drought

+ Keeping your corn plants green and healthy through the final maturity growth stage can help pack as much starch as possible into that kernel, building yield.

MANAGEMENT TIP

R6 (Physiological Maturity) | 2,700 GDUs

Kernels continue gaining weight until the milk line disappears and a black layer forms where the kernel attaches to the cob, generally around 60 days after silking. Kernel moisture is around 30% to 35% at black layer. Frost will have no impact on yield. The husks and many leaves of the plant are no longer green.

DISEASE

Anthrachnose stalk rot, Diplodia ear rot, Fusarium ear rot, Gibberella ear rot, Physoderma stalk rot

INSECTS

European corn borer, southwestern corn borer

+ Prioritize corn fields for harvesting by maturity, standability, grain moisture and ear retention; take notes on hybrids and pull samples from problem areas so you can avoid repeat issues next season.

MANAGEMENT TIP

OTHER VULNERABILITIES

Excess rain or wind, snow, hail

**Assumes a hybrid requiring 2,700 growing degree units (GDUs) to reach maturity planted at a typical date within the Corn Belt. Actual GDUs by growth stage will vary depending on hybrid, geography, soil type, management practices, weather, etc.*

