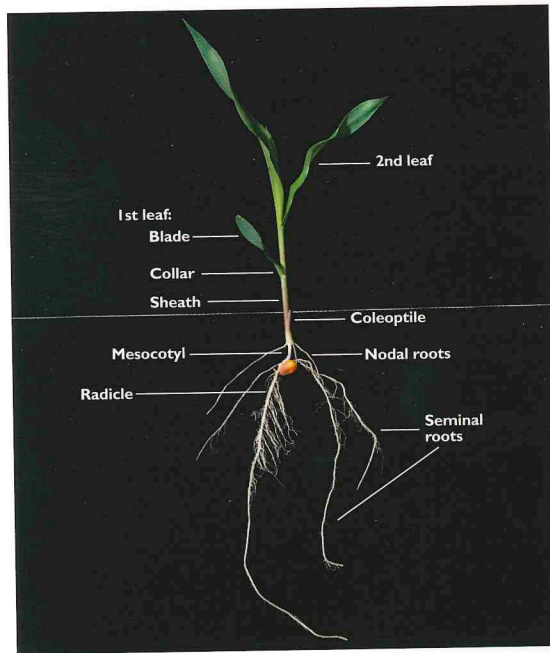


ROOT SYSTEMS

Corn has two identifiable root systems, seminal and nodal. The initial (seminal) root system helps anchor seedlings and provides nutrients and water for early plant growth. The secondary (nodal) root system forms where the mesocotyl and coleoptile meet. The nodal root system is visible by approximately V2 and becomes dominant by V6. Seeds should be planted approximately two inches deep for proper nodal root formation.



DEGREE DAYS

Corn development can be predicted by tracking degree days (DD), which measure heat accumulation based on daily air temperatures. For example, shoot emergence occurs when approximately 125 DD accumulate after planting. The base temperature for corn development is 50°F. Development of some insect species also may be predicted by using degree days, but the base temperature may differ (page 26).

Estimate daily heat accumulation for corn:

- Collect the daily high and low air temperatures and adjust (if necessary) for the base (50°F) and maximum (86°F) temperatures. If the low is under 50°F, use 50°F to calculate DD for that day. If the high exceeds 86°F, then use 86°F to calculate DD.
- The average of the adjusted high and low temperatures minus the base temperature equals the daily DD accumulation.
- Add DD gained for each day to estimate the accumulated DD over time.

Example of calculating degree days

Day 1: the high temperature is 80°F and the low is 55°F

Day 2: the high temperature is 66°F and the low is 40°F (change 40 to 50 in the equation).

Day 3: the high temperature is 92°F and the low is 72°F (change 92 to 86 in the equation).

Calculation for Day 1: $[(80 + 55)/2] - 50 = 17.5$ DD

Calculation for Day 2: $[(66 + 50)/2] - 50 = 8$ DD

Calculation for Day 3: $[(86 + 72)/2] - 50 = 29$ DD

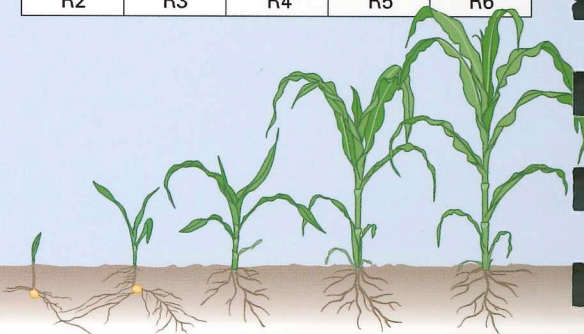
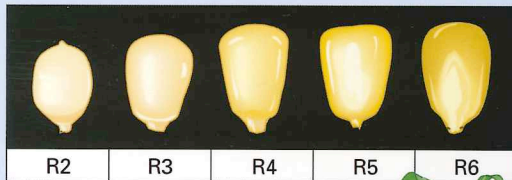
Total for three days: $17.5 + 8 + 29 = 54.5$ (round up) = 55 DD

DEVELOPMENTAL STAGES

Vegetative and reproductive stages are determined on a whole-field basis when at least 50 percent of the plants have reached or are beyond a particular stage.

Vegetative stages

- **VE:** emergence of the shoot from the soil.
- **V1:** lowest leaf has a visible collar; this leaf has a rounded tip, unlike subsequent pointed leaves.
- **V2:** two lowest leaves have a visible collar.
- **V(n):** "n" leaf collars present; there are 17 to 22 V stages before tassel emergence.
- **VT:** lowest branch of the tassel is visible, but silks have not emerged.



VE V1 V3 V7 V10

Source: Pocket Guide to Crop Development. © 2003 University of Illinois.

Reproductive stages

- **R1 (silk):** any silk is visible.
- **R2 (blister):** kernels are small and white; the endosperm (kernel fluid) is clear.
- **R3 (milk):** kernels are yellow with milky white fluid.
- **R4 (dough):** kernel contents are pasty as starch accumulates.
- **R5 (dent):** most kernels are dented due to the starch hardening at the top of the kernel. As maturity progresses, the starch hardens and the milk line moves toward the cob.
- **R6 (black layer or physiological maturity):** the milk line is no longer visible; a black layer forms at the kernels attachment, which signifies the end of dry matter accumulation.



VT R1 R6

CORN FIELD GUIDE

*A reference for identifying diseases,
insect pests, and disorders of corn.*

Hornbuckle

IOWA STATE UNIVERSITY
University Extension

CORN FIELD GUIDE

IOWA STATE UNIVERSITY
University Extension
Integrated Pest Management

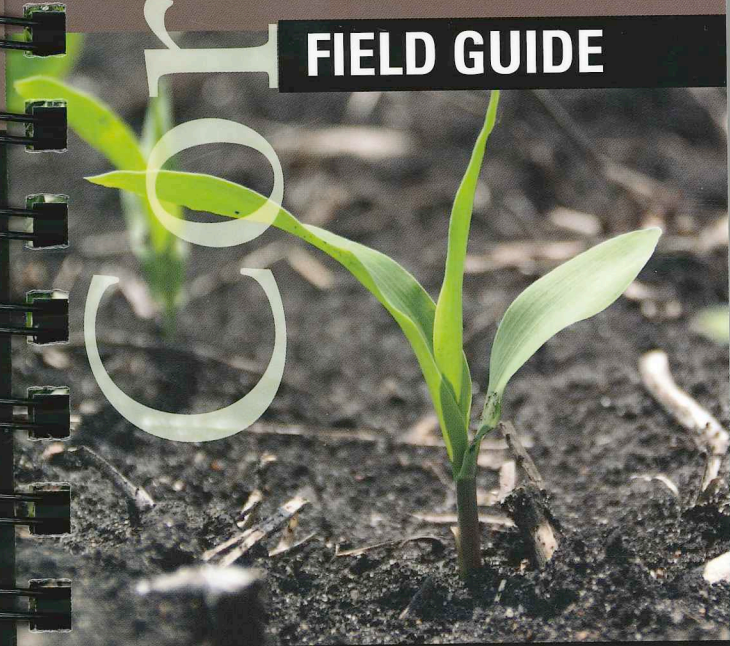


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CSI 0001



*A reference for identifying
diseases, insect pests,
and disorders of corn.*