Corn Drought Stress Management Guide

Agricultural Extension Reference

Understanding Drought Stress Symptoms

The first sign a corn plant is under moisture stress is when leaf tissue wilts and rolls during daylight hours when water demand is high but returns to normal turgor during the cooler part of the day.

Severity indicators:
- Plants rolling early in morning = more severe stress
- Plants rolling later in day = less severe stress
- Leaves not unrolling at night with browning tops = unlikely to recover

The progression starts with leaf rolling during hot afternoons, then persisting into evenings, then remaining rolled day and night, followed by death of leaf tissue starting on tips and margins, and finally progressive browning.

Impact by Growth Stage

VEGETATIVE STAGES (V1-V15):
V6-V8: Kernel row number is determined. Stress can reduce rows per ear.
V10-V15: Potential kernels per row are set during this period.
Four consecutive days of wilting can cause 5-10% yield loss.

POLLINATION (VT-R1) - THE MOST CRITICAL PERIOD:
Four consecutive days of severe wilting can reduce yield by 40-50%.
Silks desiccate when temperatures exceed 95F with low humidity.
Temperatures above 100F kill pollen grains outright.

GRAIN FILL (R2-R6):
Causes premature death of leaf tissue, shortened grain fill periods, increased lodging, and kernel abortion with lighter weights.

Water Requirements

Corn requires 20-25 inches of water during the growing season. Iowa soils hold 1.5-2.5 inches of water per foot of effective rooting depth. Root depth in Iowa has been found at depths greater than 6 feet.

Daily water use by growth stage:
- Emergence to V8: 0.10-0.15 inches per day
- V8 to VT: 0.20-0.30 inches per day
- VT to R2 (PEAK): 0.30-0.35 inches per day
- R2 to R5: 0.25-0.30 inches per day
- R5 to R6: 0.15-0.20 inches per day

Management Strategies

Prevention:
- Ensure minimum seeding depth of 2 to 2.5 inches
- Eliminate soil compaction through proper tillage
- Ensure proper early root development
- Select drought-tolerant hybrids for high-risk areas

During Drought:

- Monitor fields daily for stress symptoms
- Note time of day when leaf rolling begins
- Scout for secondary pest problems like spider mites
- Consider emergency irrigation if available and economical

Harvest Decisions:
- Estimate potential yield using kernel count method
- Consider silage harvest for severely stressed fields
- Test for nitrates before using drought-stressed corn as forage
- Light test weight grain may still have good feed value