

- Root lodging often occurs in late June and early July when thunderstorms are likely and brace roots are not yet fully developed
- Wind-induced root lodging is not always related to root injury, but is more likely to occur when root systems are damaged or restricted



Potential contributing factors to early season root lodging:

- Compacted soil around the root zone due to wet conditions at planting, resulting in restricted root development
- Wet soil early in the season, reducing the need for root expansion
- Dry soils later in the season that slow down brace root development
- Restricted root development due to unfavorable soil conditions during early nodal root growth
- Reduced root growth due to nitrogen deficiency
- Water-saturated soils at the time of a wind event



Restricted root growth caused by sidewall compaction at planting

The corn plant has three different stages of root development during its lifecycle:

Seminal roots



Nodal roots



Brace roots



Limited brace root development due to dry soil

The earlier that root lodging occurs, the less of an impact it is likely to have on yield

- In a 2-year study of simulated wind lodging, yield was reduced by 3-4% with lodging at V10 to V12
- Lodging at V13 to V15 reduced yield by 10%



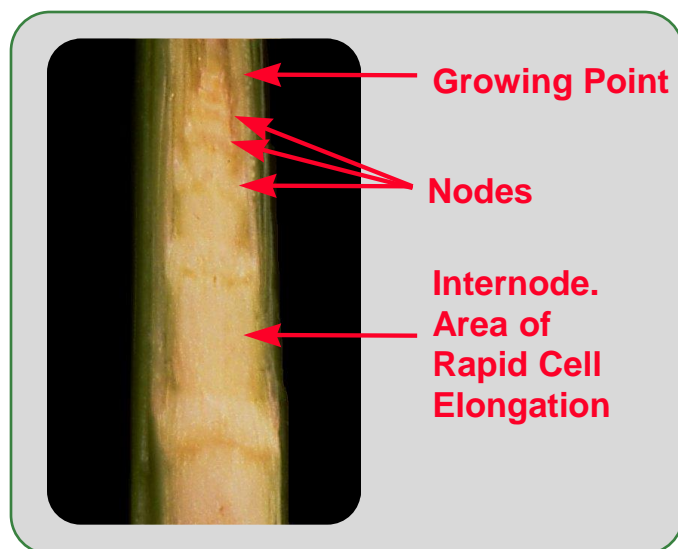
Left to right, control (no lodging) and plants with simulated wind lodging at V10, V12, and V16 stages. Lodging occurred in July, photos were taken in early September.

Corn plants are particularly susceptible to brittle snap damage at V5 to V8, when the growing point is emerging from the soil line.



Brittle snap observed at V5 to V8 often follows a surge in corn growth and development stimulated by favorable rainfall and temperature.

- A corn plant at V5 (five visible leaf collars) is entering a period of rapid growth
- Stalk growth occurs by elongation of internode cells, which increases the rigidity of the stalk. Cell walls are extremely fragile at this stage.
- At the V5 to V8 stage many nodes and inter-nodes are arranged together in a small area (see image below). This dense concentration may make the plants less flexible and more susceptible to breakage.
- Brittle snap breakage at V5 to V8 occurs below the growing point, at a stalk node at or near the soil surface. Snapped plants will not recover, nor contribute appreciably to yield.



- Many factors affect the severity of brittle snap injury, including growing conditions, field geography, crop management practices, soil type and hybrid genetics.
- Growth regulator herbicides can increase the incidence and severity of brittle snap injury by impacting cell division in the nodal area and increasing stalk brittleness.
- Growers should plant a package of hybrids and manage growth regulator herbicides carefully to spread the risk of brittle snap.

Source:

Carter, P.R. and K.D. Hudelson. 1988. Influence of simulated wind lodging on corn growth and grain yield. J. Prod. Agric. 1:295-299.



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