



Mid-season Root Lodging and Brittle Snap

Root lodging that occurs near or during pollination will likely have a negative impact on yield and harvestability

Potential contributing factors to mid-season root lodging:

- Restricted root development due to unfavorable soil conditions during the growing season
- Reduced root growth due to nitrogen deficiency
- Water-saturated soils at the time of a wind event
- Corn rootworm damage



A combination of wet soils and strong winds can lead to lodging even if roots systems are healthy; however, plants with damaged or restricted roots are more susceptible to lodging

The extent of yield loss and lodging due to rootworm feeding is affected by many factors:

- timing of root feeding
- weather conditions
- soil type and tillth
- genetic differences among hybrids for
 - root growth rate
 - total root mass, and
 - root regeneration capacity.



Corn rootworm damage reduces a plant's structural support and makes it more susceptible to lodging

Corn rootworm feeding is most extensive in early through mid-July in most regions of the Corn Belt

Mid-season root lodging is more likely to have an impact on yield than lodging at earlier growth stages

- In a 2-year study of simulated wind lodging, yield was reduced by 15-25% with lodging after V17, compared to only 3-4% with lodging at V10-V12
- Yield loss will likely be greater if root systems have been damaged by rootworm feeding



- Root lodging during pollen shed can cause silks to be covered by the leaves of lodged plants, reducing pollination success
- The later that root lodging occurs in the growing season, the less able corn is to straighten back up afterward without pronounced goose-necking
- As corn nears its full height, stalk elongation is nearly complete, making recovery after lodging unlikely

- The most common sites for breakage at this stage are at the nodes – immediately below, at or above the primary ear node.
- Upon reaching mature height, the risk of brittle snap diminishes as cell walls are strengthened by the deposition of lignin and other structural materials.



Root lodging in this field occurred very late in the season. Plants will not recover from lodging, which will make harvest more challenging

From V12 through tasselling, the corn plant is undergoing its most rapid stage of growth and is more susceptible to brittle snap

- A key factor which increases the incidence of brittle snap from V12 to tasselling is the enlargement in leaf surface area and plant height, which increases wind resistance during a period of potentially severe storms and wind events
- Snapped plants often have visible ear shoots on the stalk shortly after the wind damage event. However, the severely reduced leaf surface area usually results in limited or no grain production on injured plants.



Any conditions which promote high yield and rapid growth may, unfortunately, also promote greater brittle snap damage. It is often the most productive fields that incur damage.

Sources:

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.

Nielsen, R.L. 2002. Root Lodging Concerns in Corn. <http://www.kingcorn.org/news/articles.02/RootLodge-0711.html>