

# BETWEEN THE ROWS

July 15, 2011

ROOT LODGING FROM SUMMER STORMS

ISSUE: 13

## Background

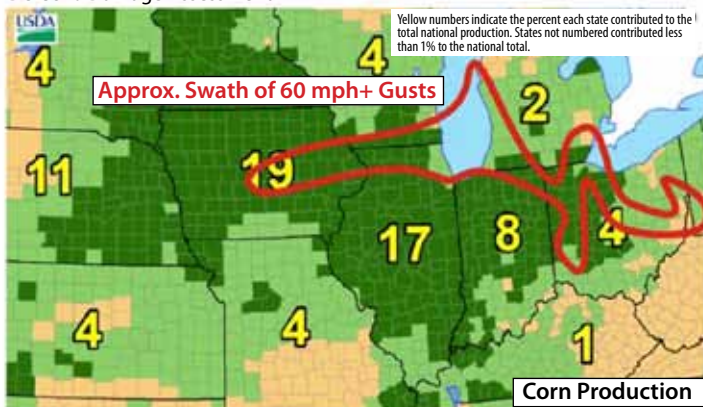
Corn can be impacted by summer thunderstorms that include heavy rain and wind. The timing of the storm relative to the stage of growth and many other agronomic factors can determine if root lodging occurs or green snap of plants may happen. Recent storms across the upper Midwest caused significant root lodging and green snap to occur in many areas. Heavy rains accompanied by severe winds occurred at a time when corn is vulnerable to lodging.

During late June and early July, the corn crop is in a fast vegetative growth stage and the plant height can outgrow the root mass and its ability to hold the plant upright. The brace root system which begins to develop during flowering has not reached adequate size yet to support the plant against wind storms. Rain can soften the soil and make root lodging more pronounced when wind follows. Dry conditions can cause more green snap to occur on corn, and generally corn is vulnerable to green snap through pollination, but it is unpredictable.

## Current Conditions

A severe storm passed through parts of central and eastern Iowa and continued into northern IL and southern WI on July 11 (see map for outline of severe wind area). Heavy rain in some areas was accompanied by strong to severe winds that adversely affected many acres of corn. Both severe root lodging and green snap was a result.

### Derecho Damage Assessment



SOURCE: Commodity Weather Group

The stage of growth of the corn in the affected area varied from around V10-V12 to R1 (pollination). The stage of growth is very important when assessing the impact of the storm damage. The ability of the corn at V10-V12 stage of growth to recover from root lodging is very good. The plant is very likely to grow back to near vertical, but with some lower plant "goose necking". Yield or harvest operations will only have a minor impact (yield may be reduced 0-5%).



As damage affects plants beyond this stage a greater impact will be evident in yield and harvest operations. Plants that do not have the tassel emerged have enough stalk elongation left that allows the plant to partially recover to near vertical. Plants at full height (fully emerged tassel) will only recover at the top part of the plant (generally above the ear). Root lodging at R1 and beyond can cause yield reductions ranging from 10-30% some research has shown. This does not include any harvest loss that may occur while trying to "pickup lodged corn".

Root lodging many times is not uniform across fields or hybrids. Several factors influence the amount and severity of root lodging. Besides the stage of growth, soil conditions and moisture can impact how plants react to wind. Many areas had periods of excess rainfall either during planting or after plants were emerged. Standing water and cool temperatures caused reduced stands or delayed or stunted growth early in the season.

Standing water usually reduces the oxygen level in the soil and causes cooler soil temperatures and compaction. The result on the plant is a reduced root size and slower uptake of nutrients. Reduced root size can increase the root lodging potential. Several fields with root lodging exhibit some tillage or fertilizer application patterns also. Insect feeding damage and soil tilling can also impact the amount of root lodging that occurs.

The yield reduction from root lodging can be attributed to at least two factors. When part of the root is pulled from the soil, nutrient uptake is disrupted. Over a period of time the root system can recover, but some yield can be lost. Lodged corn changes the leaf orientation. The plant no longer has the leaves at the optimum angle to receive the energy from the sun. More leaves are shaded for a period of time, while the plant orientation improves.

### Green Snap

Green snap that occurs in corn is generally in the central and western cornbelt. In our marketing area, it is more sporadic and unpredictable and depends on severity of winds, timing, stage of growth, and hybrid involved. Plants broken below the top ear generally will not contribute to yield. A second ear has the potential to develop, but many times it may be late and have minimal contribution to yield. Plants broken above the ear can continue to develop an ear but at a reduced size because of the lack of leaves to feed the developing kernels.

Stand loss can reduce yields, but not at a direct proportion to lost plants. Hybrids have great ability to recover and compensate for lower plant populations. The yield loss table shows an estimate of yield potential with reduced stands.

### Yield Loss of Corn Due to Stalk Breakage Below the Primordial Ear

| Stand Reduction | Expected Yield Loss |
|-----------------|---------------------|
| 25%             | 10%                 |
| 50%             | 26%                 |
| 75%             | 43%                 |

Source: University of Minnesota

### Summary

- Root lodging can cause some yield reduction depending on the stage of growth the damage occurs. V10-V12 may show 0-5% yield reduction and root lodging at R1 and beyond can cause 10-30% yield reduction.
- Plants can partially recover from severe root lodging, particularly if the damage occurs before pollination.
- Green snap is a sporadic occurrence in our marketing area and is unpredictable.
- Yield reduction from stand loss due to green snap is not proportional, hybrids can compensate for lower populations.
- When evaluating damage, allow time for plant recovery before estimating yield or the impact on harvest operations.

