Green snap opinions vary

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Abstract
Major windstorms slashed across the center third of Iowa on June 29. Tree and structural damage filled the headlines, but Iowa cornfields suffered as well from a phenomenon called green snap. Green snap is the condition where rapidly growing stalks are broken by strong, sudden winds associated with thunderstorm downbursts. Over one-quarter million corn acres suffered significant green snap from the June 29 storm, based on estimates from field crop specialists.

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Major windstorms slashed across the center third of Iowa on June 29. Tree and structural damage filled the headlines, but Iowa cornfields suffered as well from a phenomenon called green snap. Green snap is the condition where rapidly growing stalks are broken by strong, sudden winds associated with thunderstorm downbursts. Over one-quarter million corn acres suffered significant green snap from the June 29 storm, based on estimates from field crop specialists.

Fast-growing corn is very susceptible to green snap damage. The 5-8-leaf stages (10-24 inches in height) and the 12-leaf through tasseling stages are the most vulnerable growth stages. These are two periods of very rapid growth in the corn plant. New cell walls are extremely fragile and need time to harden and develop.

Several factors affect green snap. The timing and the velocity of the wind are the most important, coupled with the hybrid involved. Because it is only an occasional problem, hybrids are not evaluated for resistance to green snap. Heavy wind during cool morning hours will cause more green snap than if the wind occurred during the heat of the day. Strong-rooted hybrids with less give at the base will have more green snap than shallow-rooted plants. Conditions that favor rapid growth (adequate nitrogen, high temperatures, and good soil moisture) will increase the incidence of green snap. Phenoxy type herbicides (2, 4-D, dicamba, and clopyralid) stimulate rapid growth and dramatically increase the chances of green snap occurring.

Corn that experiences green snap at or near the soil surface will probably not produce a ear. When the damage occurs above the ear, two sources, the University of Minnesota and the University of Nebraska-Lincoln, differ in how much damage to expect.

University of Minnesota (Waseca)

Green snap that occurs later in the season (12-leaf stage through tasseling) will most often recover with only moderate yield losses. Corn produces 6-8 tiny potential ears. Each of these ears can normally be found at the base of each leaf up through about the 12-14-leaf stage. The top ear becomes the dominant ear. The table shows data from University of Minnesota tests done at Waseca in 1994 and 1995, and provides yield losses when the stalk was broken above the top, or dominant ear. Stalks broken below the dominant ear averaged an additional 16 percent less yield.

<table>
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<th>Green snap (%)</th>
<th>Yield (bu/acre)</th>
<th>Yield (%) (undamaged stand = 100%)</th>
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University of Nebraska-Lincoln (Clay Center)

Natural green snap resulting from storms was observed in cornfields in 1993 and 1994 in Nebraska. Data showed that corn plants damaged at the V12 developmental stage through tasseling did not reproductively compensate for the damage. Stand loss resulted in a directly proportional loss in yield. Studies are continuing to determine what characteristics contribute to stalk weakness, and therefore the potential for green snap.

These two studies provide somewhat conflicting data, but it is clear that stand loss translates into yield loss. Given the nature and timing of this year’s weather events, the damage will probably result in significant crop loss. Damaged stalks face heavy weed competition and will be prone to late-season leaf and stalk diseases.

Typically, the best-managed fields are the biggest victims of green snap. Factors that increase green snap also tend to be those that favor high yields. Some apparent relationships and their effect on green snap include the following:

- Post-plant N applications tend to increase green snap over preplant applications.
- Conventional tilled fields warm up and grow more rapidly than no-till fields, leading to higher green snap risk.
- High organic matter soils tend to have more incidence of green snap than low organic matter soils.
- Thunderstorm winds come from varying directions; thus, there is no best row orientation (north-south versus east-west).

Hybrids differ in their susceptibility to green snap so plant several different hybrids. Do not apply growth regulator herbicides to corn beyond the 3-leaf stage. Corn planted at least 2 inches deep is less prone to green snap. Plants with shallow or restricted root systems can have less tolerance to phenoxy herbicides. Investigate crop insurance programs that will give coverage for green snap.

What can you do if green snap has occurred in your field? Replant options are short at best. With planting no longer an option, the biggest concern will be weed growth in the opened canopy, and harvest difficulties from weed interference and weed seed development will be major concerns. The variables that determine the fate of damaged fields include the following:

- crop growth stage,
- where the snap occurred on the plant,
- the hybrid’s ability to produce secondary ears and tillers,
- disease potential,
• leaf defoliation damage to remaining leaves,
• growing conditions immediately following damage, and
• weed density and growth after the damage.

Mowing as weeds start to set seed may help avoid increasing the weed seedbank. Harvest aid herbicide treatments may be considered in some situations, but are too late to prevent seed set. The opened canopy also will remove soil protection, increasing the chance of significant erosion damage in mid- and late summer. If the field lies on particularly erodible soils, clean tillage should be avoided, if possible.

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