

# AGRONOMIC ALERT



## GREENSNAP AND CORN LODGING ISSUES

Greensnap mainly occurs in the Western to Central Corn Belt where high winds are more prevalent. Rapidly growing corn in the late vegetative stages to tasseling is most vulnerable to greensnap. Rainstorms, with high winds, impact the likelihood of greensnap as well as root lodging.

### Probability of Greensnap

Fast-growing corn plants have a higher probability for stalk breakage at lower nodes, commonly known as greensnap. Corn plants are most susceptible during rapid growth when cells are dividing and may not be as strong. Productive-looking fields have the potential for greater amounts of greensnap because the nodes of a faster growing plant are more brittle than those of a slower growing plant.

Ironically, corn grown in the most favorable conditions and those that promote early growth increase corn vulnerability to greensnap. Conditions that influence greensnap incidence are:

1. An **environment** favorable for corn growth, i.e.; adequate moisture, adequate to high nitrogen (N), warm temperatures.
2. Factors that increase **early season growth** such as; high N, phosphorus (P), and potassium (K) rates, spring applied N, tillage, and high organic matter.
3. **Plant densities and leaf orientation** have an effect. Leaves of plants in high densities tend to orient perpendicular to the row rather than parallel to it. These plants are more likely to break than plants with other orientations when strong winds are perpendicular to the rows. This orientation seems to explain why we seldom have greensnap events (from straight-line winds) that affect both north-south and east rows. Damage usually occurs in one row orientation or the other, not both.
4. Winds in **early morning or night** when plants are full of water.
5. Use of **plant growth regulators** such as Phenoxy type herbicides (2, 4-D, dicamba, and clopyralid) that stimulate rapid growth. Late application or application during hot, humid conditions may increase risk even more. Figure 1 shows an example of a field that was V8 to V9, sprayed with a plant growth regulator herbicide, and sustained approximately 5 to 10% stand loss from greensnap.
6. **Corn products** vary in their vulnerability to greensnap, due to greensnap tolerance and growth stage.
7. **Wind direction**, row direction, and location in the field can also have an effect on damage.

### Effects of Greensnap

The two stages in which greensnap effects can be most severe are the V5 to V7 (5 to 7 fully developed collars) as the growing point is emerging from the soil and a week to ten days prior (around V12) to tasseling. Corn with greensnap can produce little to no yield. Sometimes lower nodes may develop an ear, but generally do not have enough leaf area to complete kernel fill. Corn products currently available display different levels of greensnap tolerance.



Figure 1. Greensnap injury

### Corn Lodging

High winds may severely lodge or even flatten corn. From a yield standpoint, bent stalks are much better than corn that is snapped off. Before plants tassel, the lower stalk has enough flexibility to bend upward and to bring the upper stem and most of the leaves back to a more upright orientation. The prognosis for corn lodging at or after pollination is less favorable than for corn that lodged earlier.

Stalks develop lignin (become woody) as they get older, which is helpful for standability. However, damage this late in the

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vegetative growth period can result in plants that are less able to grow back toward the sun after lodging. If stalks break (stalk-lodged) rather than root-lodge from the wind, then the “plumbing” of the lower stalks is compromised, water and nutrient flow is reduced or eliminated, and the plants have little chance to grow back upright. If this happens at or just after pollination, low yield potential can be expected. Root systems that pull out of the ground can regenerate active roots, but tend to compromise grain fill.

### Estimating Loss of Yield Potential

Potential yield loss due to green snap depends on the following: crop growth stage, where the snap (or lodging) occur on the plant, the corn products ability to produce secondary ears and tillers, disease potential, leaf defoliation damage to remaining leaves, growing conditions immediately following damage, and weed growth and density after the damage. Research from Iowa State University found yield loss is directly related to the amount of stalk breakage that occurred. For example, if 10 % of the corn plants are broken, that will result in a 10 % yield reduction. This result may be due to timing. If corn ear parameters have already been determined, the corn plants are not able to compensate for reduced plant competition. However, data from the University of Minnesota indicated greensnap that occurs later in the season (V12 growth stage through tasseling) will most often recover with only moderate yield losses. Either way greensnap can result in yield loss; therefore, management and prevention are of great interest.

### Management

Some experts indicate further research is needed to fully understand how to avert greensnap. Current recommendations of how to prevent greensnap include:

1. Find out the greensnap rating for each corn product grown by asking your local agronomist.
2. If susceptibility varies, plant several different corn products.
3. Do not apply growth regulator herbicides (Phenoxy type herbicides such as, 2, 4-D, dicamba, and clopyralid) to corn beyond the V3 corn growth stage. Always follow label directions.
4. Plant corn at a depth of at least 2 inches. Plants with shallow or restricted root systems may have less tolerance to growth regulator herbicides.
5. Investigate crop insurance programs that may give coverage for greensnap.
6. If greensnap does occur, managing weeds prior to their setting seed set using late-season herbicide treatments or mowing may be the best options.

For more information on greensnap or lodging issues, please contact your local agronomist.

Sources: Elmore, R., Abendroth, L., Cummins, G. 2006. Green snap in Iowa. Iowa State University Extension. Integrated Crop Management. ICM>2006>IC-496(19) July 10, 2006. Available on-line: <http://www.ipm.iastate.edu>; Elmore, R. 2005. Root-lodged corn at or before silking. Integrated Crop Management. Iowa State University. IC-494 (21). August 1, 2005; Elmore, R., Hoffmeister Jr., G., Klein, R., Marx, D.B. 2003. Corn Greensnap from Extreme Wind is Influenced by Several Factors. Plant Management Network. Available on-line: <http://www.plantmanagementnetwork.org>; Nafziger, E. 2003. Leaning corn and suffering soybeans. The Bulletin. July 24, 2003; North Dakota State University Extension. 2007. Green Snap Damage. North Dakota State Extension Pro Crop. Available on-line: <http://www.ag.ndsu.edu>; Thomison, P. 2003. Weather Conditions Favorable for “Green Snap”. Ohio State University. Crop Observation and Recommendation Network. Available on-line: <http://agcrops.osu.edu>; White, M., Pope, R. 1998. Green-snap opinions vary. Iowa State University Extension. Integrated Crop Management. ICM>1998>IC-480(18) July 13, 1998. Available online: <http://www.ipm.iastate.edu>



Figure 2. Greensnap injury

**Individual results may vary**, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Technology Development by Monsanto and Design(SM) is a servicemark of Monsanto Technology LLC. All other trademarks are the property of their respective owners. ©2010 Monsanto Company. AT061810; AMB061610