

AGRONOMIC ALERT



Recovery & Damage Assessment of Hail Damaged Corn

Recently, severe storms marched across the region bringing along hail that damaged corn in localized areas. Once the initial shock of viewing a severely damaged corn field has diminished, the stages of determining the extent of the damage begin.

Yield loss in corn due to hail damage results from¹:

1. Leaf area reduction caused by hail-damaged leaves and plant bruising,
2. Stand loss caused by plant death.

The severity of each of these factors is important to accurately assess the extent of hail damage and how yield potential may be affected. Evaluating the health of the growing point can be done soon after the storm, but making a decision regarding the yield potential of the field is premature, because the plants have not been given enough time to recover. To accurately assess potential yield loss from hail, corn plants should be evaluated 7 to 10 days after the storm³. At that time, it should be easier to more accurately distinguish between living plants and plants unable to withstand the hail damage itself or subsequent disease infection.

Defoliation and Bruising Effects

Defoliation results in the loss of photosynthetically active leaf area. The severity of the loss depends not only on the amount of leaf area removed, but also the corn growth stage when damage occurs. Keep in mind that leaf damage usually looks worse than it really is, especially in the first few days after a storm. Shredded leaves that remain green and attached to the plant will often continue to produce photosynthates for the plant (Table 1).

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Hail damaged corn at V3 stage.

Table 1. Estimated potential yield loss in corn from defoliation. Please note the corn growth stage is based on the 'indicator leaf' method and not the 'V stage' method developed by Iowa State University.

Source: J. V. Vorst. 1993. Assessing hail damage to corn. NCH-1. National Corn Handbook.

Corn Growth Stage	Percent Leaf Area Destroyed				
	20	40	60	80	100
% Potential Yield Loss					
7 Leaf	0	1	4	6	9
8 Leaf	0	1	5	7	11
9 Leaf	0	2	6	9	13
10 Leaf	0	4	8	11	16
11 Leaf	1	5	9	14	22
12 Leaf	1	5	11	18	28
13 Leaf	1	6	13	22	34
14 Leaf	2	8	17	28	44
15 Leaf	2	9	20	34	51
16 Leaf	3	11	23	40	61
17 Leaf	4	13	28	48	72
18 Leaf	5	15	33	56	84
19-21 Leaf	6	18	38	64	96
Tassel	7	21	42	68	100
Silked	7	20	39	65	97
Brown Silk	6	18	36	60	90
Pre-Blister	5	16	32	54	81
Blister	5	16	30	50	73

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Assessing the extent of stem and whorl bruising and how it affects the health and productivity of the plant is difficult. Bruising may allow an avenue for infection, which may increase the risk for stalk lodging later in the season. Most foliar fungicides are not labeled to control stalk rots; however, they can help protect the health of the plant thereby reducing the susceptibility to stalk rots. Additionally, hail damage alone is not sufficient justification to spray a fungicide. Conditions favoring disease development, such as a susceptible hybrid, wet and damp conditions throughout much of the year, drought conditions during grain set that favor cannibalization, and/or continuous corn fields that have high levels of inoculum, may warrant a fungicide application. Consult your local agronomist for additional information. Fields that contain severely bruised plants may need to be evaluated at the end of the season.

Stand Losses

By V6, the growing point is generally above the soil surface. Wind, hail, and/or driving rains may cause stalks to break below the growing point. If stalks are broken below the growing point, they will not recover to produce an ear. After V10, potential yield loss and stand reductions are on nearly a one-to-one ratio (for example: 80% stand = 80% yield potential) and are in addition to losses shown in the defoliation table (Table 1)². Stand loss at this stage will likely result in considerably greater loss of yield potential compared to leaf defoliation.



Corn with leaves damaged by hail.

Estimating Total Yield Loss

Many factors are involved in estimating total loss of yield potential. These include effects from defoliation, stand loss, plant bruising, possible disease infection of damaged plants, stalk lodging later in the season, and environmental conditions during the remainder of the growing season². Growers should scout for and monitor for stalk rot and lodging, increased nitrate levels in fields intended for animal feed, and late-season weed flushes due to increased light penetration in defoliated areas. Potential yield loss figures due to damaged or missing plants are only estimates. True yield loss from a hail storm cannot be fully determined until harvest.

Sources:

¹ R.L. Nielsen. 2011. *Recovery from hail in young corn*. Purdue University Cooperative Extension. www.agry.purdue.edu (verified 6/12/2011).

² J. Lauer. 1994. *Assessing hail damage in corn*. University of Wisconsin Cooperative Extension. <http://corn.agronomy.wisc.edu> (verified 6/12/2011).

³ J. V. Vorst. 1993. *Assessing hail damage to corn*. NCH-1. National Corn Handbook.

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. Technology Development by Monsanto and Design® is a registered trademark of Monsanto Technology LLC. All other trademarks are the property of their respective owners. ©2011 Monsanto Company. 06.16.2011.EJP