NK® Brand Crop Barometer

More Yield

Better Choices

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Crop Stress – Hail

Severe thunderstorms can often have hail associated with them. With this dry summer to date many localized areas have had hail events. Crop damage can be devastating depending on the stage of crop development. Twenty to fifty percent defoliation of corn plants from 12 leaves to tassel has been reported. In those same areas soybeans have similar defoliation (50%) and are at R1-R3 stage (open flowers visible to pods visible). What does this mean to you if you were within a zone of hail?

Corn

The key to determining potential yield loss is to determine the stage of the crop. Then determine the percent of leaf defoliation. Once determining both of these variables use the side chart to determine potential yield loss.

Although hail damage looks disastrous, it rarely amounts to more than a slight yield loss. For example, at the 13 leaf stage and 30% defoliation, you might anticipate 3% yield loss (see Table 1). During the vegetative stage, the plant still has more emerging leaves to continue to produce chlorophyll. The corn plant is most vulnerable to hail damage at the tassel stage since all of its leaves have emerged.

Table 1. Estimated Percentage Corn Crain Yield Loss Due to Defoliation at Various Growth Stages

Growth Stages	% Leaf Defoliation									
	10	20	30	40	50	60	70	80	90	100
	% Yield Loss									
7 leaf	0	0	0	1	2	4	5	6	8	9
9 leaf	0	0	1	2	4	6	7	9	11	13
11 leaf	0	1	2	5	7	9	11	14	18	22
13 leaf	0	1	3	6	10	13	17	22	28	34
15 leaf	1	2	5	9	15	20	26	34	42	51
17 leaf	2	4	7	13	21	28	37	48	59	72
Tassel	3	7	13	21	31	42	55	68	83	100
Silk	3	7	12	20	29	39	51	65	80	97
Blister	2	5	10	16	22	30	39	50	60	73
Milk	1	3	7	12	18	24	32	41	49	59
Soft dough	1	2	4	8	12	17	23	29	35	41
Dent	0	0	2	4	7	10	14	17	20	23
Mature	0	0	0	0	0	0	0	0	0	0

Agronomy Guide for Field Crops, Publication 811. Ontario Ministry of Agriculture, Food and Rural Affairs. 2002. Pg96.

At this stage yield reductions of 30 % can occur if 50 % defoliation occurs. Even if pollination is successful, the ear's ability to fill will likely be reduced because few leaves remain intact to produce the necessary carbohydrates to complete grain fill.

Soybeans

Soybeans are more resilient than corn due to their ability to regrow from axillary buds. Plants 8-20 inches tall, flowering with pods present in mid-canopy can

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handle significant defoliation before yield loss becomes significant. To estimate yield loss you must determine crop stage and estimate percent defoliation then use the side table.

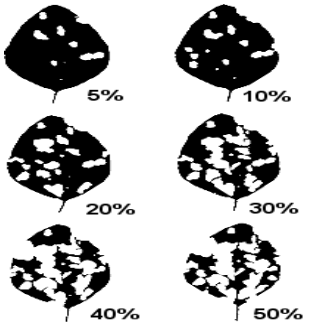
Although 30% defoliation at the R3 stage looks terrible, anticipated yield loss is only around 4%. As soybeans shift to the pod fill stage (R5), yield loss from hail increases significantly as flowering and pod development is complete. Further stress on recovering plants will influence the final yield outcome. Heat and moisture stress will limit the plants ability to recover. Bruised stems and ripped leaves may also become sites of disease infection.

Table 2. Percent Yield Loss at Various Levels of Leaf Area Loss and Growth Stages

	% Leaf Defoliation									
Growth Stage	10	20	30	40	50	60	70	80	90	100
R1	0	1	2	3	3	4	5	6	8	12
R2	0	2	3	5	6	7	9	12	16	23
R3	2	3	4	6	8	11	14	18	24	33
R4	3	5	7	9	12	16	22	30	39	56
R5	4	7	10	13	17	23	31	43	58	75
R6	1	6	9	11	14	18	23	31	41	53

Agronomy Guide for Field Crops, Publication 811. Ontario Ministry of Agriculture, Food and Rural Affairs. 2002. Pg 131.

Bean Leaf Beetle



Bean leaf beetle feeding is on the increase in many areas of South-western Ontario. Adult feeding appears as small round holes between the major leaflet veins. Pod feeding of BLB can increase it's susceptibility to secondary diseases such as Alternaria. The biggest concern is that BLB vectors bean pod mottle virus which causes the plant and seed to become wrinkled and mottled, reducing the quality of the seed. In seed fields and beans grown for Asian export, BLB should be controlled to avoid bean pod mottle virus from contaminating samples. Thresholds for bean leaf beetle range from 16 adult beetles per foot of row in early seedling stages to over 39 per foot of row at V2+ stages. Many fields are at critical defoliation levels.

Soybean Development	% Defoliation
Pre-bloom (i.e., vegetative stages)	30%
Bloom to pod-fill	15%
Pod-fill to maturity (unless pod feeding observed)	25%

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