

THE RESPONSE OF SOYBEANS TO SIMULATED HAIL DAMAGE

Study Guidelines

A demonstration trial was planted on April 4, 2013 at the Monsanto Learning Center at Scott, MS. The trial was designed to assess the response of soybeans to simulated hail damage. Five Asgrow® soybean brands (AG4531, AG4533, AG4632, AG5332, and AG5633) were planted in 38-inch rows at populations of 80,000, 120,000, and 160,000 seeds per acre. A flail mower was used to simulate hail damage (Figure 1). Soybean plants were 24 inches tall and in the R2 (full flowering) growth stage when mowed. Approximately 10 inches of the soybean top growth was mowed out (Figure 2). This removed terminal dominance and allowed soybean plants to branch. Plots were harvested on September 18, 2013 to assess the yield of undamaged and damaged soybeans.



Figure 1 (above). Tractor flail mower used to simulate hail damage in the demonstration trial.

Figure 2 (left). Approximately 40% of the soybean top growth was cut off with the flail mower when plants were in the R2 stage of growth.



Results and Observations

Soybeans in this demonstration trial yielded in the 70 bushel per acre range. At harvest, the mowed soybeans were about 10 inches shorter than the undamaged plants. When yields were averaged across the five Asgrow® soybean brands at the low (80,000 seeds per acre) and high (160,000 seeds per acre) planting populations, there was no difference in yield between damaged and undamaged plants (Figure 3). The data suggests that when soybean plants are moderately damaged by hail (not completely defoliated), they have the potential to recover without affecting yield.

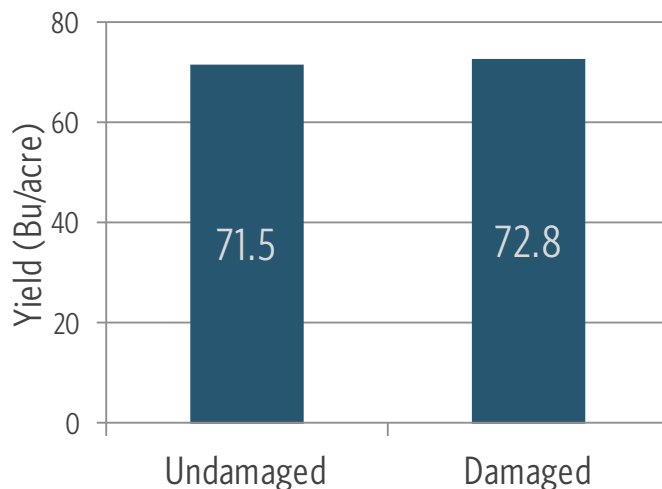


Figure 3. Yield of undamaged and damaged soybeans when averaged across five Asgrow® soybean brands and two planting populations.

When averaged across the Asgrow® soybean brands and planting populations, yield differences were greater at the lower planting population (Figure 4). This indicates that soybeans may recover better from hail damage at lower populations, possibly because of plants being able to branch out more.

All five Asgrow® soybean brands in this testing responded similarly at the low planting population of 80,000 seeds per acre (Figure 5). However, at the high planting population of 160,000 seeds per acre, AG4533 brand yielded less when they were damaged (Figure 6). AG4531 and AG4632 brands had the highest yield increases when damaged.

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Summary Comments

- Hail damage to soybeans can result in reduced stands, leaf defoliation, stem damage, and pod damage. After soybean plants advance in their vegetative growth, they have the capacity to recover from severe defoliation. Hailstorms that occur during the reproductive stages of development, especially pod fill (R3 to R6), can do the most damage. Hail that damages soybeans later in the season can also leave the crop susceptible to disease and insect damage.
- Soybean plants have the ability to recover by branching out after a hail event. Results of this demonstration suggest that, although soybean plants damaged by hail may look bad, plants can recover and yield may not be greatly affected. Yield loss predictions should be based on the stage of growth at the time of damage, and the degree of plant damage.
- Hail can drive down into the soybean crop canopy causing foliar damage and extensive bruising and stem damage which may not be accounted for in this testing. Therefore, a hail storm causing similar visual injury could be more damaging to yield and overall plant health than that caused by the flail mower injury in this demonstration.

Sources and Legals

Klein, R.N. and C.A. Shapiro. 2011. Evaluating hail damage to soybeans. University of Nebraska-Lincoln extension publication EC128. <http://extension.unl.edu/>; Roozeboom, K. 2008. Hail damage on soybeans. Kansas State University Extension Agronomy e-Updates number 145. <http://www.agronomy.edu>.

The information discussed in this report is from a single site, 2 rep demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

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.

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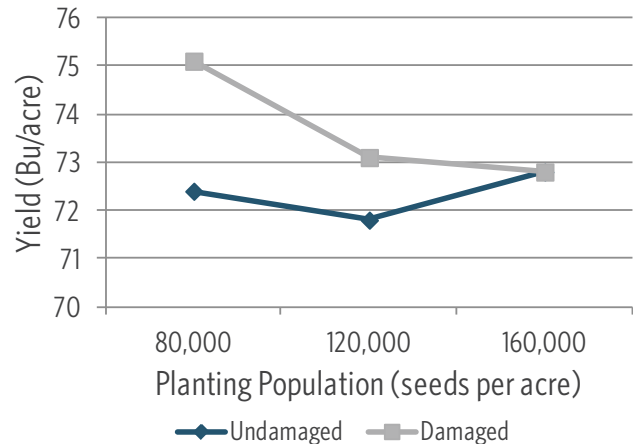


Figure 4. Yield of undamaged and damaged soybeans at three planting populations when averaged across four Asgrow® soybean brands.

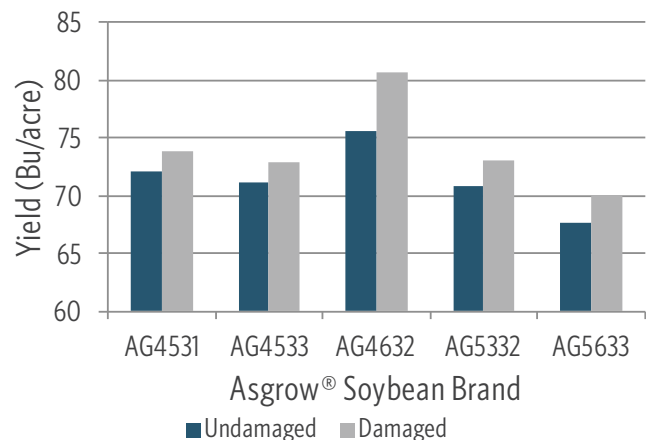


Figure 5. Yield of undamaged and damaged Asgrow® soybean brands when planted at the low population of 80,000 seeds per acre.

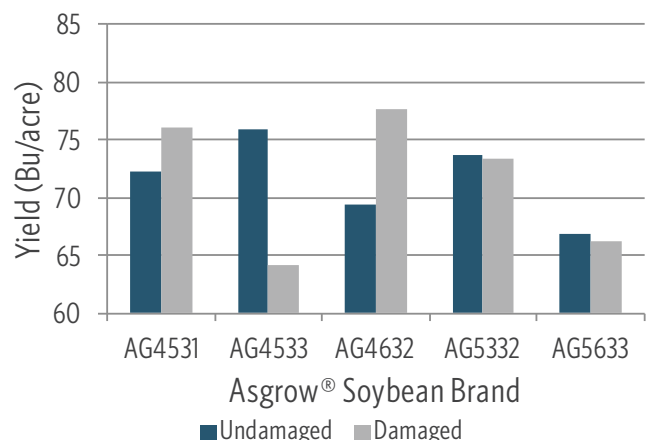


Figure 6. Yield of undamaged and damaged Asgrow® soybean brands when planted at the high population of 160,000 seeds per acre.