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Hail and Fungicides Update 2013

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Abstract
When crop hail damage occurred in the past, farmers could either replant or see if crops would grow out of the damage, depending on extent and timing of hail. However, there have been significant changes in production practices for corn and soybean, especially concerning fungicide use and the labeling of fungicides for the mitigation of plant stress such as hail injury.

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Hail and Fungicides Update 2013

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When crop hail damage occurred in the past, farmers could either replant or see if crops would grow out of the damage, depending on extent and timing of hail. However, there have been significant changes in production practices for corn and soybean, especially concerning fungicide use and the labeling of fungicides for the mitigation of plant stress such as hail injury.

One reason that fungicide applications are considered for a hail-damaged crop is that disease infection is more likely to occur after wounding. However, foliar diseases managed by fungicides do not require wounds for infection. It is also argued that crops could be more susceptible to fungal pathogens as a result of increased stress. Another reason fungicides are considered after hail damage is that physiological benefits gained from a fungicide application will help sustain or increase yield of damaged crops. It is important to note that claims by the chemical industry do not state fungicide applications recover yield potential lost due to hail damage. But some claims do suggest fungicide application to hail-damaged crops will protect the remaining green tissue and allow plants to maximize yield after sustaining damage.

In 2012, we used a custom made hail machine to shoot ice at soybean plants (Figure 1), and weed eaters in corn plots (Figure 2), to simulate hail damage. We examined various pesticides, pesticide application timings, and hail damage timings in corn and soybean at two locations in Iowa.

Figure 1. The business end of the hail machine “hailing” soybean plants. Photo courtesy Amy Asmus.
In this first year of the study, averaging data from all 2012 treatments within each corn and soybean experiment indicated:

- Non-injured plots yielded more than those receiving simulated hail;
- Simulated hail applied at growth stage R4 (full pod) resulted in less yield loss than hail simulated at growth stage R1 (beginning bloom) for soybean;
- Simulated hail applied at growth stage R2 (blister) resulted in more yield loss than hail simulated at growth stage VT (tasselling) for corn;
- In general, an application of fungicide to corn seven days after a simulated hail event resulted in greater yields compared to applying the fungicide at two days after the simulated hail event;
- Application of fungicide in corn usually resulted in increased yield over non-application across all treatment averages (both hailed and non-hailed); and
- In soybean, fungicide application resulted in increased yield about 60 percent of the time across all treatments (both hailed and non-hailed). Breaking this down we see that:
  - Treatments with Headline® averaged 1.2 bu/acre more, Domark® averaged 0.4 bu/acre less, and Stratego® YLD averaged 2.8 bu/acre less than untreated controls.
  - Treatments with Headline® plus insecticide averaged 1.8 bu/acre more than plots with insecticide alone.

Current research suggests using fungicides is most beneficial in response to a disease threat, which did not exist during the dry conditions of 2012. These preliminary data, along with the need for testing these treatments in the context or a more “normal” season, suggest application of fungicides on hail-damaged crops merits additional research. We are repeating the experiment in 2013 with additional treatments and we will keep you posted.

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