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## Hail and Fungicide Use on Corn

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# Hail and Fungicide Use on Corn

## **Abstract**

Hail annually destroys approximately 1.4 percent of corn (Climate of Iowa 2006). Years like 2009 stand out vividly to many people as major hailstorms cut across parts of Iowa, damaging more than 1 million acres of corn in a single season. Many farmers and agronomists have been interested in the effects of fungicide application on corn after a hail event (Figure 1). In response, a multi-year study looking at mid-season "hail events" with fungicides applied after simulated hail events was completed. Here is a [video](#) of the project.

## **Keywords**

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## **Disciplines**

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## Hail and Fungicide Use on Corn

By Adam Sisson, Daren Mueller and Alison Robertson, Department of Plant Pathology and Microbiology

### Hail in Iowa

Hail annually destroys approximately 1.4 percent of corn (Climate of Iowa 2006). Years like 2009 stand out vividly to many people as major hailstorms cut across parts of Iowa, damaging more than 1 million acres of corn in a single season. Many farmers and agronomists have been interested in the effects of fungicide application on corn after a hail event (Figure 1). In response, a multi-year study looking at mid-season "hail events" with fungicides applied after simulated hail events was completed. Here is a [video](#) of the project.



Figure 1. Battered corn plants after a hail storm. Photo courtesy Daren Mueller.

### Corn hail trial

The purpose of this three-year trial was to determine if fungicide application to corn damaged by hail at VT or R2 reduced foliar disease severity or improved yield compared to hailed corn that did not receive fungicide.

The fungicide treatments were application of Headline® AMP (pyraclostrobin and metconazole; BASF Corporation; 10 fl oz/acre). Two fungicide timings were compared for each hail event at approximately VT and R2: 1) "Immediate" applications were sprayed 2-6 days (averaging 3 days) after a simulated hail event and 2) "Deferred" applications were sprayed 7-12 days (averaging 8 days) after a simulated hail event. Non-hailed and no-fungicide plots were included as controls. Hail was simulated using weed trimmers in 2012 and 2013, and with an ice-application machine in 2014. A p-value of 0.1 was used when statistically analyzing yield and disease data from each of five site years.

## RESULTS

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- Simulated hail decreased yield every time it was applied.
- In three of five site years, plots with simulated hail had less foliar disease than no-hail controls.
- At the two locations without foliar disease differences between simulated hail plots and no-hail controls, a natural hail event occurred over the entire plot, including the no-hail controls.
- Yield responses were numerically higher with the application of a fungicide after VT and R2 stages in 12 of 20 comparisons in simulated hail plots and in 12 of 20 comparisons in no-hail plots at either the “immediate” or “deferred” application timing at any site year. The increases however, were not significantly higher at  $P = 0.1$ .

Results suggest that in fields with low levels of fungal foliar disease, hail-injured corn plants may have less disease than plants without hail injury. Also, pyraclostrobin + metconazole application may not provide yield-increasing plant health benefits after a mid-season hail event when foliar diseases are not present at damaging levels. However, IF you are going to apply a fungicide after hail injury to mid-season corn, it appears that waiting at least a week would be more beneficial than an immediate application.

## Future studies

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We are now studying management of crops after hail events during early vegetative growth or during grain fill. Some of the more severe hail events the past few years have occurred earlier in the season. We have already applied “hail storms” to V5/V6 corn at research farms in Kanawha, Iowa, and Ames, Iowa, in 2015, with fungicide applications following at 7-10 days afterward (Figure 2).



Figure 2. Corn plots immediately after simulated hail (left) and nine days later (right) from hail trials this spring.

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