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Should Hail Damaged Crops be Sprayed With a Fungicide?

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Abstract

Last week severe storms hit several counties in Iowa with hail ranging from softball to pea size causing significant crop damage. Hail damage to corn may negatively affect yield potential (see Elmore and Abendroth, 2009) but may have little effect on soybean yield potential (see Pedersen, 2008).

Keywords

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Should Hail Damaged Crops be Sprayed With a Fungicide?

By Alison Robertson and Daren Mueller, Department of Plant Pathology

Last week severe storms hit several counties in Iowa with hail ranging from softball to pea size causing significant crop damage. Hail damage to corn may negatively affect yield potential ([see Elmore and Abendroth, 2009](#)) but may have little effect on soybean yield potential ([see Pedersen, 2008](#)).

There have been reports from previous years of hail-damaged crops benefiting from an application of fungicide. To date, we know of only one statistically sound study to test the effect of fungicide on damaged corn that has been done. To compare the effect of a fungicide on hail-damaged corn, we need a non-hail damaged check to compare the effect of a fungicide on both hail damaged and non-hail damaged corn at the same site.

Carl Bradley, Extension Plant Pathologist at University of Illinois, conducted such [a study in 2007](#) near Champaign, IL. In this replicated study, a weed-eater was used to simulate hail damage. Treatments included "hail-damaged" and "non-hail damaged corn" that was either sprayed or not sprayed with a fungicide. Fungicide applications did not statistically increase yield when applied on tasseling corn that was "hail-damaged" the previous day (Table 1).

Table 1. Effect of simulated hail damage and foliar fungicides applied at tassel emergence on gray leaf spot severity and yield of a susceptible corn hybrid near Champaign, Illinois, in 2007 (Bradley and Ames, 2008)

Simulated Hail ¹	Fungicide	Rate/acre	GLS severity ²	Yield (bu/acre)
No	Untreated		57	174
	Headline	6 fl oz	33	179
	Quadris	6 fl oz	42	170
	Quilt	14 fl oz	40	155
Yes	Untreated		62	141
	Headline	6 fl oz	48	144
	Quadris	6 fl oz	47	142
	Quilt	14 fl oz	35	140
LSD ³			12	11

¹ Hail was simulated by damaging corn with a weed-eater type string mower

² Gray leaf spot severity (0-100 percent scale)

³ Fisher's protected least significant difference ($P = 0.05$)

In the limited number of replicated studies conducted in Iowa that were established on hail-damaged crops, no significant yield responses have been

seen from fungicides. For example, last year a trial was established on hail-damaged soybeans in western Iowa. Severe hail damage occurred in late June when soybeans were at the beginning of the R1 growth stage and fungicide was applied on July 28, when soybeans were at the R2 growth stage. There was no statistical difference between the fungicide-treated (38.6 bu/ac) and the non-treated control (39.9 bu/ac).

Disease risks associated with hail damage

It is important to remember that a fungicide application can not recover yield potential lost due to hail damage. Fungicides protect yield potential by reducing disease. There are some diseases of corn that are favored by wounding, e.g., Goss's wilt, common smut and stalk rot. Similarly bacterial blight and bacterial pustule on soybeans are favored by wounding. Fungicides are not effective against the pathogens that cause these diseases. The foliar diseases that are managed by fungicides (e.g., gray leaf spot, northern corn leaf blight, eye spot, and common rust on corn, and brown spot and frog eye on soybeans) are caused by pathogens that do not require wounds for infection. These foliar diseases will influence the yield response to fungicides more so than hail damage.

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