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Ryan Rusk
Iowa State University

Paul C. Kassel
Iowa State University, kassel@iastate.edu

Joshua L. Sievers
Iowa State University, sieversj@iastate.edu

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Yield Response of Soybeans to Headline Fungicide

Abstract
The use of fungicides in corn and soybean production has typically been used to manage severe disease outbreaks. In recent years, fungicides have been applied to fields with low levels of disease because of perceived yield increases. A study was initiated at the Northwest Research Farm in 2006 to study the impact that Headline fungicide applications have on yields of four different soybean varieties.

Keywords
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Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences

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Yield Response of Soybeans to Headline Fungicide

RFR-A1050

Ryan Rusk, farm superintendent
Paul Kassel, ISU field agronomist
Josh Sievers, ag specialist

Introduction
The use of fungicides in corn and soybean production has typically been used to manage severe disease outbreaks. In recent years, fungicides have been applied to fields with low levels of disease because of perceived yield increases. A study was initiated at the Northwest Research Farm in 2006 to study the impact that Headline fungicide applications have on yields of four different soybean varieties.

Materials and Methods
One widely grown soybean variety from Pioneer, Asgrow, Syngenta (NK), and Kruger were evaluated each season from 2006 to 2010. Soybean varieties ranged between a 2.0 and 2.4 relative maturity. Soybean varieties could have been changed from year-to-year (Table 1). Soybeans were sprayed with Headline at 6 oz/acre and non-ionic surfactant at 5 oz/acre (0.25% v/v) when they reached the R3-R4 stage of growth. Spray volumes ranged between 15 and 20 gallons/acre with spray pressures at 40 lb/square inch.

Plot size was eight rows (20 ft) wide by 94 ft long and included four replications each year. The middle six rows of treated plots were sprayed with Headline fungicide when they reached the appropriate growth stage. The middle four rows were harvested for yield. Soybean yields were adjusted to 13 percent moisture. Statistical analysis was used to analyze the yield data, with a significance level of $P \leq 0.05$.

Results and Discussion
Overall, the varieties in this study showed a yield advantage to fungicide 65 percent of the time ($P \leq 0.05$) (Table 1). The most consistent response to fungicide was from NK and Kruger varieties (100% and 80% of the time, respectively). Pioneer and Asgrow varieties showed a yield response 40 percent of the time. It is important to note that only one variety from each company was used each season so broad generalizations should not be made about fungicide response to all varieties within a company’s portfolio.

Combining the data from all years and all varieties shows a 3.0 bushel increase in yield by spraying Headline fungicide (Table 1). Yield increases by year have ranged from 1.9 bushels/acre up to 3.8 bushels/acre. Fungicide response by company ranged from 2.8 bushels/acre to 3.3 bushels/acre.

Consistent yield responses of soybeans to Headline fungicide have been noted, but it is important to note that the continual use of one fungicide mode of action may lead to resistance among fungal diseases and reduce efficacy of these products when disease pressure is high.

Acknowledgements
The authors would like to thank Dan Beran of BASF for the fungicide and financial assistance for this study.
Table 1. Response of soybean varieties to Headline fungicide (2006–2010).

<table>
<thead>
<tr>
<th>Variety</th>
<th>Fungicide</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Average</th>
<th>Response</th>
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<td>Asgrow</td>
<td>Yes</td>
<td>64.8</td>
<td>NS</td>
<td>62.0</td>
<td>**</td>
<td>52.1</td>
<td>NS</td>
<td>61.8</td>
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<tr>
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<td>No</td>
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<td>56.7</td>
<td>51.3</td>
<td>59.1</td>
<td>55.1</td>
<td>56.9</td>
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<tr>
<td>Kruger</td>
<td>Yes</td>
<td>65.4</td>
<td>**</td>
<td>61.4</td>
<td>NS</td>
<td>55.6</td>
<td>**</td>
<td>65.0</td>
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<tr>
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<td>58.7</td>
<td>53.4</td>
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<tr>
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<td>Yes</td>
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<td>**</td>
<td>61.8</td>
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<td>56.7</td>
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<td>64.2</td>
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<tr>
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<td>57.6</td>
<td>54.5</td>
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<td>Pioneer</td>
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<td></td>
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<tr>
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<td>+1.9</td>
<td>+3.4</td>
<td>+3.2</td>
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</tr>
</tbody>
</table>

** = statistically different (P ≤ 0.05).
NS = not statistically different (P ≥ 0.05).

1Asgrow varieties used were: 2006–2007 = Ag2403; 2008–2009 = Ag2406; 2010 = Ag2002.
2Kruger varieties used were: 2006–2007 = K223; 2008–2010 = K201.
3NK varieties used were: 2006–2007 = S23-Z3; 2008 = S20-P3; 2009–2010 = S21-N6.