

Yield Response of Soybeans to Headline Fungicide

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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.

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Table 1. Response of soybean varieties to Headline fungicide (2006–2010).

Variety	Fungicide	2006		2007		2008		2009		2010		Average	Response
Asgrow varieties ¹	Yes	64.8	NS	62.0	**	52.1	NS	61.8	NS	59.4	**	60.0	+ 3.1
	No	62.5		56.7		51.3		59.1		55.1		56.9	
Kruger varieties ²	Yes	65.4	**	61.4	NS	55.6	**	65.0	**	60.9	**	61.7	+ 3.1
	No	61.8		58.7		53.4		61.9		57.2		58.6	
NK varieties ³	Yes	64.7	**	61.8	**	56.7	**	64.2	**	62.0	**	61.9	+ 3.3
	No	60.9		57.6		54.5		61.3		58.8		58.6	
Pioneer varieties ⁴	Yes	64.8	NS	63.5	NS	53.6	**	64.5	**	60.9	NS	61.5	+ 2.8
	No	62.6		60.7		51.0		59.8		59.3		58.7	
Combined	Yes	64.9		62.2		54.5		63.9		60.8			
Total	No	62.0		58.4		52.6		60.5		57.6			
	Response	+2.9		+3.8		+1.9		+3.4		+3.2			

** = statistically different ($P \leq 0.05$).

NS = not statistically different ($P \geq 0.05$).

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.

⁴Pioneer varieties were: 2006–2007 = 92M32; 2008 = 92M11; 2009–2010 = 92Y30.