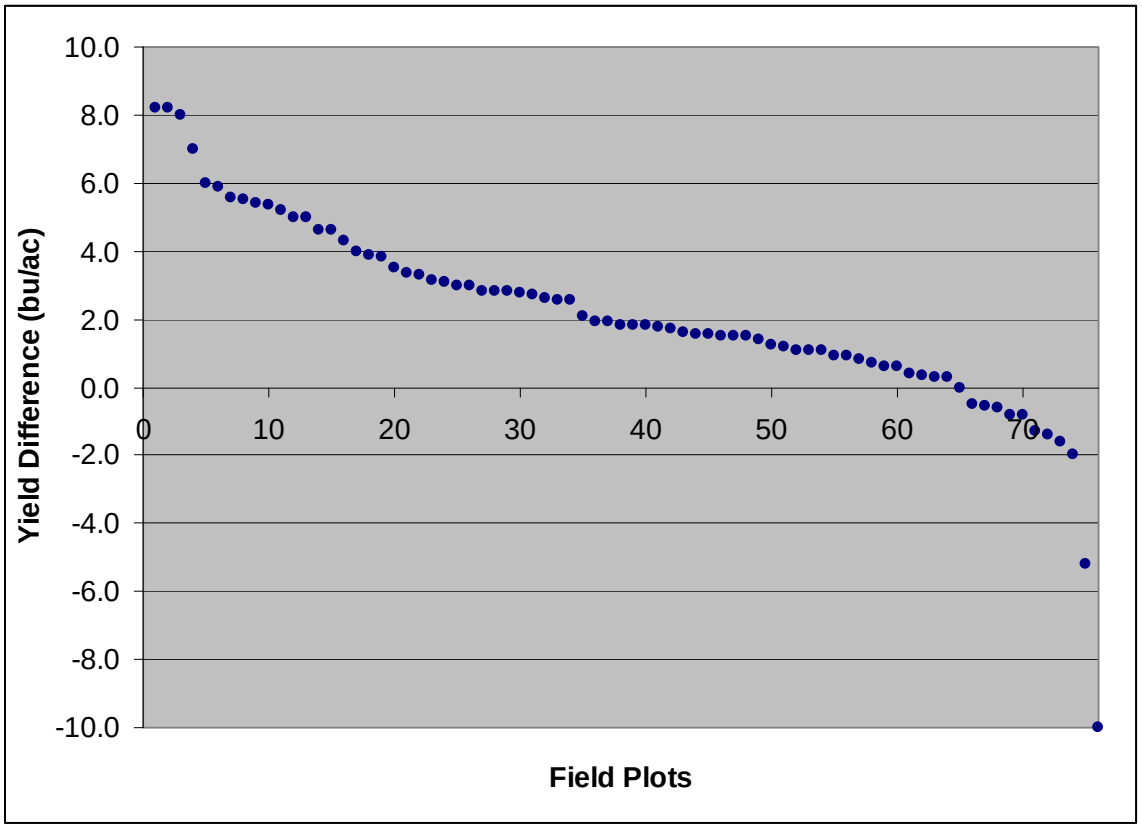
Is the Soybean Variety Important for Making Accurate Fungicide Application Decisions?

Purpose:

Foliar fungicide applications have increased soybean yields with an average yield response in Ontario of 2.1 bu/ac over the last 6 years.(Figure 1). However, only about 30% of the spray decisions produce a yield response that was economically beneficial to the producer. So far, no clear correlation to disease pressure, tillage practice, seed variety, or weather has been demonstrated for the level of yield response achieved with a fungicide application. Recent work in corn has revealed that the yield response is highly dependent on the hybrid. This project is designed to assess whether soybean variety plays a significant role in the yield response to foliar fungicides. If some varieties respond more than others, in addition to other factors, this information could be important in making economic management decisions.

Figure 1: Soybean Response to Foliar Fungicide in Ontario (2005-2010)



Methods:

This project compared the yield response of 20 soybean varieties to Headline foliar fungicide. The varieties were carefully chosen based on different parentage and a range of observed disease resistances. Trials were planted in 2 locations replicated 4 times each year. These sites were near Exeter and Chatham, Ontario. Seed quality

parameters including oil, protein, seed size, and germination were measured to determine if the fungicide had any impact on seed quality.

Fields were treated as a whole when applying herbicides, fertilizers, and tillage practices.

At each field site soil samples were collected at planting time. Field sites were also assessed for disease and insect pressure, once during both July and September.

Results:

Table1. Variety Yield Response to Headline Fungicide (2009)

Variety		Exeter			Chatham	
		Untreated (bu/ac)	Headline (bu/ac)		Untreated (bu/ac)	Headline (bu/ac)
1	Secan #1 AM0908A5-DOYN	71.9	74.6		66.4	65.8
2	Secan #2 AM0808B3-DOYN	68.8	71.2		69.1	71.9
3	Secan RCAT MatRix	68.9	70.7		55.9	54.7
4	Secan RCAT MiRRa	66.6	67.9		58.8	60.0
5	Syngenta S14-A7	69.5	69.8		53.4	57.9
6	Syngenta S14-K6	65.9	70.7		59.6	60.8
7	Syngenta S17-A1	70.4	71.0		61.2	61.5
8	Syngenta S21-N6	70.1	71.8		65.2	71.0
9	Monsanto 8-60RY	71.4	71.4		70.3	70.0
10	Monsanto 28-61RY	71.9	75.6		71.5	66.0
11	Monsanto 29-60RY	73.8	76.2		71.7	71.8
12	Monsanto 31-10RY	77.0	75.0		77.3	75.9
13	Hyland RR Respond	69.8	68.3		68.5	70.0
14	Hyland RR Rodney	65.4	70.8		59.6	62.1
15	Hyland HR 12R42	68.1	72.2		57.9	62.6
16	Hyland HS 11R46	71.7	72.8		63.6	59.4
17	Pioneer 91M01	71.4	70.1		59.3	60.5
18	Pioneer 91M41	67.9	70.0		60.9	62.7
19	Pioneer 91Y90	70.7	70.2		67.2	68.3
20	Pioneer 92Y30	70.5	73.1		64.4	66.7
Average Yield		**70.1**	**71.7**		**64.1**	**65.0**

Conclusions – Exeter:

No differences in days to maturity were found in 2009; in 2010 there was a delay of 1.6 days in days to maturity in the plots sprayed with Headline. Seed quality on a scale of 1-5 showed no difference. Seed weight was significantly better for the Headline treated plots by 0.8 grams/100 seeds in 2009 and 1.0 grams/100 seeds in 2010. There was no

difference in the germination of the seed from plants that had been sprayed with Headline compared to those that had not been sprayed.

Yield was better for the Headline treated plots by 1.6 bushels/acre in 2009, and 3.1 bushels/acre in 2010 averaged across all the varieties.

Table 2. Variety Yield Response to Headline Fungicide (2010)

Variety		Exeter			Chatham	
		Untreated (bu/ac)	Headline (bu/ac)		Untreated (bu/ac)	Headline (bu/ac)
1	Secan #1 AM0908A5-DOYN	59.5	66.6		77.5	78.0
2	Secan #2 AM0808B3-DOYN	60.9	66.0		71.7	76.6
3	Secan RCAT MatRix	59.8	64.5		62.9	62.8
4	Secan RCAT MiRRa	54.3	55.9		70.2	68.8
5	Syngenta S14-A7	56.9	63.0		71.1	70.1
6	Syngenta S14-K6	58.9	61.2		61.3	64.3
7	Syngenta S17-A1	61.0	64.4		64.5	70.7
8	Syngenta S21-N6	59.7	64.3		74.8	73.5
9	Monsanto 8-60RY	59.5	68.5		77.5	78.1
10	Monsanto 28-61RY	63.1	66.0		77.7	70.5
11	Monsanto 29-60RY	62.4	67.2		84.1	82.9
12	Monsanto 31-10RY	61.4	66.1		82.0	78.2
13	Hyland RR Respond	55.5	54.6		74.1	75.7
14	Hyland RR Rodney	58.8	58.3		77.5	76.2
15	Hyland HR 12R42	52.8	574		63.7	61.8
16	Hyland HS 11R46	56.4	57.8		68.1	69.5
17	Pioneer 91M01	60.2	61.5		67.7	70.6
18	Pioneer 91M41	59.4	62.6		63.5	63.1
19	Pioneer 91Y90	63.3	58.9		64.4	68.9
20	Pioneer 92Y30	59.4	61.1		69.7	69.4
Average Yield		**59.2**	**62.3**		**71.2**	**71.5**

Conclusions – Chatham:

Days to Maturity showed a 2 day delay in maturity with Headline in 2009 and 1.6 days delay in 2010. Seed quality on a scale of 1-5 showed no difference. Seed weight was better for the Headline treated plots by 1.0 grams/100 seeds in 2009 and 0.6 grams/100 seeds in 2010. There was no difference in the germination of the seed from plants that had been sprayed with Headline compared to those had not been sprayed.

No significant yield difference was detected in either 2009 or 2010.

Summary:

At both sites Headline increased days to maturity; this trend is consistent with other work that has been done with fungicides to date.

Seed size was improved by 2.5% on average in the 2009-2010 period, when using Headline. This improvement in seed size is consistent with other work that has been done involving fungicide use and its impacts on seed size. Seed quality was not significantly impacted by spraying at either site.

While this study has shown yield gains at the Exeter location for the past two years, 1.6 bu/ac in 2009 and 3.1 bu/ac in 2010, there was no increase in yields at the Chatham location over both years. Varieties did not respond differently to the Headline fungicide to date in this study.

Next Steps:

This was the second year of a 3 year project so additional data must be collected to make robust conclusions.

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