

## **Performance of Warrant Herbicide for Weed Control in Early and Normal Planted Soybeans at Rochester, MN, in 2011.**

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The objective of this trial was to evaluate the crop response of Warrant herbicide in early and normal planted soybeans in southeastern Minnesota. The research site was a Lawler loam series with a pH of 6.2, O.M of 2.4%, and soil test P and K levels of 99 ppm and 164 ppm, respectively. The field was fall mold board plowed, disked and field cultivated once prior to planting. The soybean variety, Asgrow 1832, was planted on April 18 and May 10, 2011, at a depth of 1.5 inches in 30 inch rows at 150,000 seeds per acre. A randomized complete block design was used with four replications. Preemergence (PRE) and postemergence (POST) treatments were applied with a tractor-mounted sprayer delivering 20 gpa at 32 psi using Turbo Tee 11002 nozzles. Stand count and population estimates of the plots were taken on May 17, 24, and June 1. Plant heights and canopy closure were measured on June 30 and July 11, 2011. Application dates, environmental conditions, and crop stages are listed below. The center two rows of each plot were machine harvested on October 3, 2011.

### **SUMMARY**

Challenging spring planting conditions were the norm for SE Minnesota in 2011. In a typical year, soybean planting will start in the last week of April and is generally finished by the third week of May. In 2011 very few soybeans had been planted even after the second week of May. Cool and wet conditions hampered both corn and soybean planting.

In this trial, soybeans were planted on April 18<sup>th</sup> and May 10<sup>th</sup>. April 18<sup>th</sup> planted soybean stands were reduced by approximately 50 percent regardless of whether a pre-emergence herbicide was used or not. In addition, early post emergent herbicide applications of Warrant did not impact soybean stand counts in the April 18<sup>th</sup> planted soybeans.

Soybean emergence was also impacted by weather for the May 10<sup>th</sup> planted soybeans. Stands were reduced by 33 percent regardless of whether a pre-emergent or early post emergent herbicide was used.

Soybean vigor and crop response to herbicide application was measured by evaluating plant height and canopy closure. For the April 18<sup>th</sup> planted soybeans, plots treated with Valor and the low rate of Warrant pre-emergence were significantly taller (7/11 rating date) than V2 treated applications of Warrant and the untreated check. Canopy closure was also reduced with the high rate of Warrant applied at V2 when compared to the Valor pre-emergence treatment.

For the May 10<sup>th</sup> planted soybeans, plots treated with Valor pre-emergence were significantly taller than plants in the untreated check (7/11 rating date). In addition, the Valor treated plots had significantly faster canopy closure than all of the Warrant treated plots (regardless of application timing) and of the untreated check.

Soybean yields were significantly different by planting date only. The earlier planted soybeans had higher yields than the later planted soybeans. Herbicide treatment, rate, and timing had no impacts on final grain yield. (University of Minnesota Extension Regional Office, Rochester).

<b>Date</b>	<b>4/18 - Early</b>	<b>6/3 - Early</b>	<b>5/10 - Normal</b>	<b>6/7 - Normal</b>
<b>Treatment</b>	PRE	POST	PRE	POST
<b>Temperature</b>				
Air	51.6	75.0	86.0	85.0
Soil	51.6	68.5	72.5	84.9
<b>Relative Humidity (%)</b>	40	78	60	34
<b>Wind (mph)</b>	3	17	20	14
<b>Soil Moisture</b>	Adequate	Adequate	Adequate	Dry
<b>Soybean</b>				
Stage		V2		V3
Height inches)		3.7		2.8
<b>Rainfall after each application</b>				
Week 1	1.63	0.51	0.51	2.26
Week 2	0.45	1.78	1.78	2.89
Week 3	0.97	2.89	0.66	0.19

**Table 1. Plant stand and population before POST Warrant herbicide applications in early and normal planted soybeans at Rochester, MN in 2011.**

Treatment	Rate	Plant Stand & Population						Yield
		5/17		5/24		6/1		
	(rate/A)	Per 8 ft	Plants/a	Per 8 ft	Plants/a	Per 8 ft	Plants/a	(bu/A)
<b>Early Planting – April 18, 2011</b>								
Untreated		32	68,880	31	68,340	-	-	48.5
<b>PRE</b>								
Warrant	3.33 pt/a	35	77,050	34	74,600	-	-	53.2
Warrant	6 pt/a	32	69,150	34	73,240	-	-	51.1
Valor	1.96 oz/a	36	77,590	38	83,580	-	-	51.3
<b>POST (V2 Soybean, 6/3/11)</b>								
Warrant	3.33 pt/a	33	72,420	30	66,160	-	-	51.1
Warrant	6 pt/a	32	71,060	34	72,960	-	-	48.9
<b>Normal Planting – May 10, 2011</b>								
Untreated		-	-	49	107,540	43	93,110	41.3
<b>PRE</b>								
Warrant	3.33 pt/a	-	-	47	102,370	44	96,380	40.3
Warrant	6 pt/a	-	-	45	98,830	42	90,660	42.5
Valor	1.96 pt/a	-	-	47	102,370	41	88,210	40.0
<b>POST (V2 Soybean, 6/7/11)</b>								
Warrant	3.33 pt/a	-	-	51	110,530	49	106,450	40.0
Warrant	6 pt/a	-	-	49	106,450	45	96,920	38.3
<b>LSD (P=0.10)</b>		<b>NS</b>	<b>NS</b>	<b>6.7</b>	<b>14,490</b>	<b>NS</b>	<b>NS</b>	<b>6.3</b>

**Table 2. Plant height and canopy closure after POST Warrant herbicide applications in early and normal planted soybeans at Rochester, MN in 2011.**

Treatment	Rate	Plant Height		Canopy Closure	Yield
		6/30	7/11	7/11	
	(rate/A)	(Inches)	(Inches)	(Inches between row)	(bu/A)
<b>Early Planting – April 18, 2011</b>					
Untreated		11.4 ab	17.0 bc	9.6 abc	48.5
<b>PRE</b>					
Warrant	3.33 pt/a	12.1 a	19.4 a	7.8 abc	53.2
Warrant	6 pt/a	12.1 a	18.4 ab	8.0 abc	51.1
Valor	1.96 oz/a	12.6 a	19.1 a	7.0 c	51.3
<b>POST (V2 Soybean, 6/3/11)</b>					
Warrant	3.33 pt/a	10.5 bc	16.6 bc	10.2 ab	51.1
Warrant	6 pt/a	10.8 bc	16.8 bc	10.4 a	48.9
<b>Normal Planting – May 10, 2011</b>					
Untreated		9.4 c	15.5 c	9.1 abc	41.3
<b>PRE</b>					
Warrant	3.33 pt/a	9.9 c	16.4 bc	9.5 abc	40.3
Warrant	6 pt/a	10.1 c	16.8 bc	9.8 ab	42.5
Valor	1.96 pt/a	9.9 c	17.8 abc	7.4 bc	40.0
<b>POST (V2 Soybean, 6/7/11)</b>					
Warrant	3.33 pt/a	9.9 c	16.3 bc	10.0 ab	40.0
Warrant	6 pt/a	9.7 c	16.8 bc	9.3 abc	38.3
<b>LSD (P=0.10)</b>		<b>0.9</b>	<b>1.3</b>	<b>1.6</b>	<b>6.3</b>

**Table 3. Plant stand and population before POST Warrant herbicide applications in early planted soybeans at Rochester, MN in 2011.**

Treatment	Rate	Plant Stand & Population				Yield
		5/17		5/24		
		Per 8 ft	Plants/a	Per 8 ft	Plants/a	
	(rate/A)					(bu/A)
<b>Early Planting – April 18, 2011</b>						
Untreated		32	68,880	31	68,340	48.5
<b>PRE</b>						
Warrant	3.33 pt/a	35	77,050	34	74,600	53.2
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Warrant	3.33 pt/a	33	72,420	30	66,160	51.1
Warrant	6 pt/a	32	71,060	34	72,960	48.9
<b>LSD (P=0.10)</b>		<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>	<b>NS</b>

**Table 4. Plant height and canopy closure after POST Warrant herbicide applications in early planted soybeans at Rochester, MN in 2011.**

Treatment	Rate	Plant Height		Canopy Closure	Yield
		6/30	7/11	7/11	
		(Inches)	(Inches)	(Inches between row)	
	(rate/A)				(bu/A)
<b>Early Planting – April 18, 2011</b>					
Untreated		11.4 ab	17.0 b	9.6 ab	41.3
<b>PRE</b>					
Warrant	3.33 pt/a	12.1 ab	19.4 a	7.8 b	40.3
Warrant	6 pt/a	12.1 ab	18.4 ab	8.0 ab	42.5
Valor	1.96 oz/a	12.6 a	19.1 a	7.0 b	40.0
<b>POST (V2 Soybean, 6/3/11)</b>					
Warrant	3.33 pt/a	10.5 b	16.6 b	10.2 ab	40.0
Warrant	6 pt/a	10.8 ab	16.8 b	10.4 a	38.3
<b>LSD (P=0.10)</b>		<b>1.2</b>	<b>1.6</b>	<b>2.1</b>	<b>NS</b>

**Table 5. Plant stand and population before POST Warrant herbicide applications in normal planted soybeans at Rochester, MN in 2011.**

Treatment	Rate	Plant Stand & Population				Yield
		5/24		6/1		
		Per 8 ft	Plants/a	Per 8 ft	Plants/a	
	(rate/A)					(bu/A)
<b>Normal Planting – May 10, 2011</b>						
Untreated		49	107,540	43	93,110	41.3
<b>PRE</b>						
Warrant	3.33 pt/a	47	102,370	44	96,380	40.3
Warrant	6 pt/a	45	98,830	42	90,660	42.5
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<b>POST (V2 Soybean, 6/7/11)</b>						
Warrant	3.33 pt/a	51	110,530	49	106,450	40.0
Warrant	6 pt/a	49	106,450	45	96,920	38.3
LSD (P=0.10)		NS	NS	NS	NS	NS

**Table 6. Plant height and canopy closure after POST Warrant herbicide applications in normal planted soybeans at Rochester, MN in 2011.**

Treatment	Rate	Plant Height		Canopy Closure	Yield
		6/30	7/11	7/11	
		(Inches)	(Inches)	(Inches between row)	
	(rate/A)				(bu/A)
<b>Normal Planting – May 10, 2011</b>					
Untreated		9.4	15.5 b	9.1 a	48.5
<b>PRE</b>					
Warrant	3.33 pt/a	9.9	16.4 ab	9.5 a	53.2
Warrant	6 pt/a	10.1	16.8 ab	9.8 a	51.1
Valor	1.96 pt/a	9.9	17.8 a	7.4 b	51.3
<b>POST (V2 Soybean, 6/7/11)</b>					
Warrant	3.33 pt/a	9.9	16.3 ab	10.0 a	51.1
Warrant	6 pt/a	9.7	16.8 ab	9.3 a	48.9
LSD (P=0.10)		NS	0.9	1.0	NS