

Oilseed Sunflower Response to Headline (Pyraclostrobin)



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Objective

Evaluate oilseed sunflower response with Headline (pyraclostrobin) fungicide under low rust severity levels.

Materials and Methods

The field experiments were conducted on a Heimdahl-Emrick loam soil with 6.7 to 6.9 pH and 2.8 to 3.2% organic matter at the NDSU Carrington Research Extension Center. Experimental design was a randomized complete block with three replicates. Mycogen '8N429CL' was planted on June 10, 2005 and May 31, 2006; and '8N386CL' was planted on May 21, 2007, and May 14, 2008, in 30-inch rows. Headline treatments were applied to the center 6.67 ft of 10- by 30-ft plots with a CO₂-pressurized, hand-held plot sprayer at 17 gal/A and 30 to 35 psi through TJ-60, or flat-fan 80015 or 8002 nozzles. In 2008, sunflower leaf rust was first noted in the trial on July 28 and rust scores were determined by visually evaluating the upper four leaves of five plants/plot (Figure 1). Harvest dates were October 26, 2005; October 16, 2006; November 19, 2007; and October 27, 2008.



Figure 1. Sunflower rust.

Results and Discussion

In 2005, sunflower rust was absent from the trial when visually evaluated August 5 and 18, and September 2 (data not shown). Sunflower maturity tended to be delayed with Headline compared to the untreated check (Table 1). Seed yield, test weight and oil content were similar among treatments. In 2006, sunflower rust was not detected in trial until September 14, with severity at 0.1% across treatments (data not shown). Sunflower maturity tended to be delayed with Headline compared to the untreated check (Table 2). Seed yield and quality were similar among treatments. In 2007, sunflower rust was present on August 31 and September 25, but severity among treatments was low at 0.1% (data not shown). Sunflower development time, seed yield, and oil were similar among treatments (Table 3). Test weight with the early Headline treatment was greater than the untreated check. In 2008, sunflower rust incidence was high in September but severity was low and generally similar among treatments (Table 4). Seed yield was less with Headline at 6 fl oz/A applied at R1, R2, and R4 stages of growth compared to other fungicide treatments. Seed moisture, test weight, and oil content were similar among treatments.

Table 1. Sunflower response to Headline, Carrington, 2005.

No.	Treatment ¹			R9 Jday	Seed yield lb/A	Test weight lb/bu	Seed oil %
	Name	Rate	Unit				
1	Headline	3	fl oz/a	273	1488	28.8	41.7
	NIS	0.25	%v/v				
2	Headline	6	fl oz/a	273	1413	29.2	42.1
	NIS	0.25	%v/v				
3	Headline	9	fl oz/a	273	1652	28.6	41.7
	NIS	0.25	%v/v				
4	Untreated check	x	x	272	1575	28.9	42.2
Mean				273	1532	28.9	42.0
CV (%)				0.4	9.9	1.0	1.7
LSD (P=0.05)				NS	NS	NS	NS

¹Treatments applied at R1 stage. NIS=Induce.

Table 2. Sunflower response to Headline, Carrington, 2006.

No.	Treatment				First flower Jday	R9 Jday	Seed yield lb/A	Test weight lb/bu	Seed oil %
	Name	Rate	Unit	Crop stage					
1	Headline	3	fl oz/a	R2	217	259	1183	26.2	38.2
	NIS ¹	0.25	%v/v						
2	Headline	6	fl oz/a	R2	217	259	1320	25.9	38.3
	NIS	0.25	%v/v						
3	Headline	6	fl oz/a	R3	217	259	1361	25.6	37.4
	NIS	0.25	%v/v						
4	Untreated check	x	x	x	217	258	1353	26.2	38.1
Mean					217	259	1304	26.0	38.0
CV (%)					0.4	0.2	13.3	4.0	2.0
LSD (P=0.05)					NS	NS	NS	NS	NS

¹NIS=Induce.

Table 3. Sunflower response to Headline, Carrington, 2007.

No.	Treatment				First flower Jday	R9 Jday	Seed yield lb/A	Test weight lb/bu	Seed oil %
	Name	Rate	Unit	Crop stage					
1	Headline	6	fl oz/a	V4	214	266	1023	28.7	40.8
	NIS ¹	0.25	%v/v						
2	Headline	6	fl oz/a	R2	215	266	972	28.2	40.0
	NIS	0.25	%v/v						
3	Headline	6	fl oz/a	R4	214	267	927	27.7	40.7
	NIS	0.25	%v/v						
4	Untreated check	x	x	x	214	266	882	28.1	41.2
Mean					214	266	951	28.2	40.7
CV (%)					0.1	0.2	20.6	0.9	2.4
LSD (P=0.05)					NS	NS	NS	0.5	NS

Table 4. Sunflower response to Headline, Carrington, 2008.

No.	Treatment ¹			Sunflower rust ²						Seed			
	Name	Rate	Crop stage	22-Aug		5-Sep		19-Sep		Yield ³	Moisture	Test weight	Oil
			fl oz/A	inc.	sev.	inc.	sev.	inc.	sev.	lb/A	%	lb/bu	%
1	Headline	3	V12-14	2	0.1	5	0.1	5	0.4	1173	9.6	32.0	45.2
	Headline	3	V12-15										
2	Headline	6	R2	0	0.0	5	0.1	5	0.7	1227	9.9	31.2	44.0
3	Headline	6	R1	2	0.1	5	0.2	5	0.2	1049	9.2	31.6	44.6
4	Headline	6	R2	1	0.1	5	0.1	5	0.4	909.8	9.0	31.5	43.9
5	Headline	9	R2	2	0.1	5	0.1	5	0.2	1287	9.7	31.6	44.5
6	Headline	6	R3	1	0.1	5	0.1	5	0.1	1378	9.9	32.0	45.2
7	Headline	6	R4	0	0.0	4	0.1	4	0.1	1119	10.2	31.2	43.9
8	untreated check	x	x	2	0.1	5	0.1	5	0.7	no data			
Mean				1	0	5	0	5	0	1163	10	31.6	44.5
CV (%)				92.5	75.1	13.5	70.0	4.2	76.8	13.7	5.2	1.8	3.0
LSD (P=0.05)				NS	NS	NS	NS	1	NS	239	NS	NS	NS

¹All Headline treatments included NIS (Induce) at 0.25% v/v.

²Incidence=number of leaves with disease from total of five; severity=average % among affected leaves.

³LSD (P=0.10).

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