

Canola injury with preplant incorporated herbicides at Roseau and Paul, MN in 1997. Lueschen, William E., Ervin A. Oelke, Erik J. Levorson, David G. LeGare, Eric A. Ristau, and Karen Andol. The objective of this study was to evaluate potential injury to canola with four preplant incorporated herbicides. This study was conducted at two locations: near Roseau, MN on the Mike Baumgartner farm and at the University of Minnesota St. Paul Campus, St. Paul, MN. A randomized complete block design with a split plot treatment arrangement, four replications and a plot size of 6 by 25 ft was used. Main plots were five herbicide treatments and subplots were three canola varieties. The four PPI herbicide treatments were applied and incorporated twice with a field cultivator. The sethoxydim was applied when canola was 3 inches tall. Seed for both locations was prepackaged for a seeding rate of 12 viable seeds/ft<sup>2</sup> and the seed was treated with granular carbofuran and benomyl. Plots were maintained in a near weed-free condition to prevent differences in weed competition among treatments. At Roseau, the entire study was treated with ethametsulfuron + NIS at 0.019 lb/A + 0.25% for control of wild mustard. All herbicide treatments were applied at a spray volume of 20 gpa using 22 psi with a bicycle sprayer. The spray boom was equipped with 8002 nozzles and CO<sub>2</sub> was used as the pressure source. Pertinent information for the two locations follows:

	<u>Roseau</u>	<u>St. Paul</u>
Soil information		
type	Borup sandy clay loam	Waukegan silt loam
organic matter (%)	3.0	2.6
pH	8.0	6.5
P (lb/A)	14	200
K (lb/A)	234	484
Fertilization (lb/A)		
N	110	100
P	30	0
K	40	0
S	20	0
Previous crop	wheat	corn
Fall tillage	chisel plow	moldboard plow
Planting	5/29	4/25
PPI applications	5/29	4/25
Temperature		
air temp (F)	70	60
soil temp (4 in)	65	57
Relative humidity (%)	40	65
Wind (mph:direction)	0-5:N	5:SW
Rainfall after PPI applications (in)		
1st week	0.96	0.20
2nd week	0.0	0.72
3rd week	0.52	0.15

Very dry conditions were experienced at St. Paul prior to and for 6 weeks following planting. At Roseau, wet soil conditions due to heavy winter snowfall delayed planting but no precipitation was received at this location for the entire month of May. Canola emerged very unevenly at both locations as evidenced by the injury assigned to the check treatment, i.e. postemergence sethoxydim. With only one exception, there was no significant interactions between herbicide treatments and canola varieties. Canola injury, primarily stunting or uneven growth, was greater with sulfentrazone and ethalfluralin than for pendimethalin and trifluralin, especially for the second rating date. Stand reduction was greatest for sulfentrazone compared to all other herbicide treatments at both locations. Ethalfluralin resulted in greater stand reduction than trifluralin which was similar to pendimethalin. Maturity of canola was not affected much by herbicide treatment at St. Paul, however, at Roseau sulfentrazone delayed maturity by 7 to 9 days compared to the

other herbicide treatments. All herbicide treatments resulted in similar canola yields at St. Paul. However, at Roseau all PPI herbicide treatments resulted in similar yields but these yields were 267 to 426 lb/A lower than the check treatment. It was very surprising to us that the sulfentrazone treatments yielded as well as they did because of the heavy stand losses observed with this treatment. Canola has the ability to compensate for stand loss by producing more branches and more seeds/plant. Neither protein nor oil content of canola was influenced by herbicide treatments. Varietal differences were observed for canola seed yield with 'Hyloa 401' and 'Sponsor' producing the highest yield at St. Paul and Roseau, respectively. MN Agric. Exp. Paper No. 97-1-13-0043, Misc. Journ. Series, University of Minnesota, St. Paul, MN.

Table. Canola injury with preplant incorporated herbicides at Roseau and St. Paul, MN in 1997 (Lueschen, Oelke, Levorson, LeGare, Ristau and Andol).

Herbicide <sup>a</sup>	Rate (lb/A or %)	Variety	Injury			Stand Red.				
			ROS <sup>b</sup> 6/18	STP <sup>b</sup> 5/19	ROS 6/25	STP 6/9	ROS 6/18	STP 5/19	ROS 6/25	STP 6/9
(%)										
<u>Preplant incorporated</u>										
Ethalfuralin	0.95	Hyola 401	28	40	30	30	21	40	31	37
		OAC Summit	31	39	33	33	28	40	38	37
		Sponsor	30	45	33	33	26	41	33	39
Pendimethalin	1.24	Hyola 401	28	39	29	29	20	32	24	25
		OAC Summit	26	33	25	25	24	26	26	19
		Sponsor	26	28	20	20	25	20	24	17
Sulfentrazone	0.375	Hyola 401	40	40	34	34	55	56	68	44
		OAC Summit	48	48	33	33	69	59	78	41
		Sponsor	46	45	34	34	55	61	68	41
Trifluralin	1.0	Hyola 401	23	29	21	21	16	24	14	21
		OAC Summit	25	44	28	28	21	36	18	30
		Sponsor	25	35	26	26	19	30	19	21
<u>POST check</u>										
Sethoxydim <sup>a</sup> + COC	0.2 + 1.25%	Hyola 401	15	34	16	16	15	19	15	17
		OAC Summit	18	34	14	14	16	19	16	15
		Sponsor	18	30	14	14	16	16	14	16
<u>Herbicide Means</u>										
Ethalfuralin	0.95		30	41	32	32	25	40	34	38
Pendimethalin	1.24		27	33	25	25	23	26	25	22
Sulfentrazone	0.375		45	44	33	33	60	59	71	42
Trifluralin	1.0		24	36	25	25	19	30	17	24
Sethoxydim	0.2		17	33	15	15	16	18	15	16
LSD (0.10)			7	5	9	9	7	5	8	6
<u>Variety Means</u>										
Hyola 401			27	36	26	26	26	34	30	19
OAC Summit			30	39	26	26	32	36	35	19
Sponsor			29	37	25	25	28	34	31	17
LSD (0.10)			3	5	4	4	3	5	3	4
Herbicide x Variety (P>F)			0.84	0.26	0.30	0.68	0.34	0.26	0.45	0.66

<sup>a</sup>All treatments were applied and incorporated twice except sethoxydim + COC which was applied postemergence. All treatments at Roseau were sprayed with ethametsulfuron + non-ionic surfactant at 0.019 lb/A + 0.25% for control of wild mustard.

<sup>b</sup>ROS=Roseau, STP=St. Paul

<sup>c</sup>Maturity = days after planting when 90% of the pods were brown.

<sup>d</sup>Sethoxydim applied only at Roseau. Weed pressure at St. Paul did not warrant application.

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Herbicide <sup>a</sup>	Rate (lb/A or %)	Variety	Maturity <sup>c</sup>		Yield		Protein		Oil		
			ROS <sup>b</sup>	STP <sup>b</sup>	ROS	STP	ROS	STP	ROS	STP	
			DAP		lb/A		(%)		(%)		
<u>Preplant incorporated</u>											
Ethalfuralin	0.95	Hyola 401	93	93	1113	1491	26.2	29.1	38.0	35.5	
		OAC Summit	94	93	879	1572	27.3	28.5	36.7	35.8	
		Sponsor	92	94	1285	1191	26.3	29.8	38.1	35.1	
Pendimethalin	1.24	Hyola 401	93	92	1091	1607	27.2	29.2	35.2	35.7	
		OAC Summit	94	94	1059	1306	27.4	29.3	36.3	35.4	
		Sponsor	92	93	1289	1534	26.9	29.0	37.4	35.8	
Sulfentrazone	0.375	Hyola 401	98	94	1087	1532	26.5	28.2	36.8	36.0	
		OAC Summit	103	95	1110	1203	27.1	30.0	38.7	34.9	
		Sponsor	99	94	1351	1317	26.5	29.5	38.5	35.2	
Trifluralin	1.0	Hyola 401	92	92	1394	1686	26.5	27.6	36.9	36.6	
		OAC Summit	93	95	1071	1267	26.8	29.7	37.3	34.8	
		Sponsor	91	95	1288	1325	26.9	29.7	36.8	35.2	
<u>POST check</u>											
Sethoxydim <sup>d</sup>	0.2 + 1.25%	Hyola 401	91	93	1403	1483	26.7	28.8	38.1	36.2	
+ COC		OAC Summit	90	95	1616	1412	25.8	29.5	39.5	35.6	
		Sponsor	90	94	1543	1111	27.1	29.5	38.2	35.5	
<u>Herbicide Means</u>											
Ethalfuralin	0.95		93	93	1092	1418	26.6	29.2	37.6	35.5	
Pendimethalin	1.24		93	93	1146	1482	27.2	29.2	36.3	35.6	
Sulfentrazone	0.38		100	94	1182	1350	26.7	29.2	38.0	35.4	
Trifluralin	1.0		92	94	1251	1426	26.8	29.0	37.0	35.5	
Sethoxydim	0.2		91	94	1518	1335	26.5	29.3	38.6	35.8	
LSD (0.10)			3	1	263	137	0.6	0.41	1.3	0.50	
<u>Variety Means</u>											
Hyola 401			93	93	1217	1560	26.6	28.6	37.0	36.0	
OAC Summit			95	94	1147	1352	26.9	29.4	37.7	35.3	
Sponsor			93	94	1349	1295	26.8	29.5	37.8	35.3	
LSD (0.10)			1	1	112	152	0.34	0.59	0.79	0.57	
Herbicide x Variety (P>F)			0.28	0.44	0.21	0.40	0.05	0.26	0.33	0.71	

<sup>a</sup>All treatments were applied and incorporated twice except sethoxydim + COC which was applied postemergence. All treatments at Roseau were sprayed with ethametsulfuron + non-ionic surfactant at 0.019 lb/A + 0.25% for control of wild mustard.

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