

Weed management in imidazolinone-resistant canola at Fosston, 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 herbicides for weed management in imidazolinone-resistant canola. This study was located on the Ellsworth Danielson farm near Fosston, MN on a Knute fine sandy loam soil with 3.7% organic matter, pH 7.2 and soil test P and K levels of 25 and 124 ppm, respectively. A randomized complete block design with four replications and a plot size of 12 by 25 ft was used. Only the center 6 ft of each plot was used for data collection and yields were obtained from a 6 by 19 ft area of each plot. Wheat was the previous crop and the site was chisel plowed twice in the fall after wheat harvest. Prior to spring planting, the site was fertilized with 84 lb N/A, 30 lb P<sub>2</sub>O<sub>5</sub>/A and 9 lb S/A. The site was leveled with a field cultivator just prior to applying the preplant (PPI) herbicides, which were incorporated twice with a field cultivator set to till 3 to 4 inches deep. On May 21 imidazolinone-resistant canola, Pioneer Brand '45A71' that had been treated with granular carbofuran and benomyl, was planted at a seeding rate of 12 viable seeds/ft<sup>2</sup> in rows spaced 6 inches apart. After planting the canola, a single row of wheat, oat and barley were planted across one end of the plot perpendicular to the canola rows to evaluate control of these species. All treatments were applied with a bicycle sprayer equipped with 8002 flat-fan nozzles spaced 19 inches apart on the boom. The sprayer was calibrated to deliver 20 gpa at 22 psi. Application dates, environmental conditions, plant sizes and rainfall data are listed below:

Date	May 20	June 10	June 17
Application	PPI	POST I	POST II
Temperature (F)			
air	70	85	73
soil	63	72	74
Soil moisture	moist	dry	moist
Sky	p. cloudy	clear	p. cloudy
Wind (mph:direction)	5-10:N	8-10:SW	7-11:SW
Relative humidity(%)	50	50	65
Canola			
leaf no.	---	2-3	5
height (in)	---	3-4	6
Green foxtail			
leaf no.	---	2-3	4-5
height (in)	---	2-3	10
infestation (plants/ft <sup>2</sup> )	---	---	158
Wild oat			
leaf no.	---	3	4
height (in)	---	4	12
infestation (plants/ft <sup>2</sup> )	---	---	29
Redroot pigweed			
leaf no.	---	2-4	4-6
height (in)	---	0.5-1	2-3
infestation (plants/ft <sup>2</sup> )	---	---	6
Shepherdspurse			
leaf no.	---	3-4	8
height (in)	---	0.5	1
infestation (plants/ft <sup>2</sup> )	---	---	6
Wild mustard			
leaf no.	---	3-4	7-8
height (in)	---	3-4	5-7
infestation (plants/ft <sup>2</sup> )	---	---	1
Rainfall after application (in)			

1st week	1.25	0.31	6.35
2nd week	0.19	6.35	2.85
3rd week	0.00	2.85	1.88

None of the treatments caused significant crop injury or stand reduction. However, where weeds were not controlled or were controlled by POST II applications, the canola was stunted due to weed competition. Trifluralin alone gave 95% control of green foxtail on June 23 but control decreased to 71% on July 16. As rate of imazamox was increased, green foxtail control increased, specially when evaluated on June 23. By July 16 all imazamox applied at POST I gave better than 90% control. Although POST II imazamox treatments gave 89 to 91% green foxtail control on July 17, control with these treatments was only 55 to 59% on June 23. Wild oat control was better with all imazamox treatments than with trifluralin. The best control of this species was observed with trifluralin PPI followed by POST I imazamox. Redroot pigweed control on July 16 was 90% or better for all treatments except trifluralin alone and POST I clopyralid + sethoxydim. The only treatments that gave adequate control of either wild mustard or shepherdspurse were those that included imazamox. Control of wheat, oat and barley was 80% or higher for all POST I imazamox treatments, except for the 0.016 lb/A rate. Imazamox applied POST II gave only 55 to 58% control of these small grains on June 23. Treatments that did not give good green foxtail and wild oat control on June 23 resulted in reduced canola yields compared to those that gave 85% or better control at this time. The highest yielding treatments were those that received a PPI application of trifluralin followed by POST I imazamox at either 0.016 or 0.032 lb/A (MN Agric. Exp. Sta. Paper No. 97-1-13-0042. Misc. Journ. Series, University of Minnesota, St. Paul, MN).

Table. Weed management in imidazolinone-resistant canola at Fosston, Mn in 1997 (Lueschen, Oelke, Levenson, LeGare, Ristau, and Andol).

Herbicide treatment <sup>a</sup>	Rate (lb/A or %)	Grft 6/23 7/16	Wioa		Rrpw		Wimu		Shpu		Small grains		Yield (lb/A)	
			6/23	7/16	6/23	7/16	6/23	7/16	6/23	7/16	6/23	Wheat		Oat
<u>PPI</u>														
Trifluralin	0.75	95	71	65	43	98	72	18	45	45	40	45	44	946
<u>PPI/POST I</u>														
Trifluralin/endothall	0.75/0.56	95	94	68	49	96	94	0	50	33	58	68	68	1069
Trifluralin/imazamox	0.75/0.016	97	97	93	95	100	100	100	99	90	85	90	87	1514
Trifluralin/imazamox	0.75/0.032	97	98	95	98	100	99	100	99	99	98	99	100	1531
<u>POST I</u>														
Imazamox	0.016	75	91	75	79	90	97	99	97	85	75	75	75	1183
Imazamox	0.032	82	92	82	88	92	99	98	99	90	84	84	83	1192
Imazamox	0.040	88	95	88	88	92	99	99	98	86	82	82	82	1411
Imazamox + sethoxydim	0.016+0.20	85	94	85	84	89	99	99	98	88	87	87	87	1359
Imazamox + sethoxydim	0.032+0.20	85	96	85	90	88	98	99	98	86	88	88	88	1400
Clopyralid + sethoxydim	0.125+0.20	85	95	84	82	23	8	15	18	35	65	65	65	914
<u>POST II</u>														
Imazamox	0.032	59	91	59	85	80	97	71	99	78	55	55	55	995
Imazamox	0.040	55	89	55	86	76	99	79	99	66	58	58	56	1029
Check														
Weedy	---	0	0	0	0	0	0	0	0	0	0	0	0	146
LSD (0.10)		5	15	7	15	8	16	15	23	14	20	21	21	257

<sup>a</sup>Trifluralin=Treflan 4 EC; endothall=Herbicide 273 3 SC; imazamox=Raptor 1 SC. All postemergence treatments, except endothall, were applied as a tank mixture with 1.25% v/v of crop oil concentrate (Cenex Land O'Lakes 17% Class Additive) and 28% N solution.

<sup>b</sup>Bar=barley.