Evaluation of preplant, preememgence, and postemergence herbicides for weed management in canola at Roseau, MN in 1997. Lueschen, William E., Ervin A. Oelke, Erik J. Levorson, Dave G. LeGare, Eric A. Ristau, Leon Wrage, and Mark Zarnstroff. The objective of this study was to evaluate canola injury and weed control with preplant incorporated, preemergence, postemergence, and sequential herbicide applications for weed management in canola. This study was conducted near Roseau, MN on the Mike Baumgartner farm on a Borup sandy clay loam with 3.0% organic matter, pH 8.0, and soil test P and K levels of 14 and 234 lb/A, respectively. The site was fertilized with 110 lb N/A, 30 lb P_2O_5/A, 40 lb K_2O/A, and 20 lb S/A prior to planting. Wheat was the previous crop and the site was moldboard plowed after wheat harvest. The study was designed as a randomized complete block experiment with four replications and a plot size of 12 by 30 ft. Data were collected only on the center 6 feet of each plot. Before application of the PPI herbicides the site was leveled with a field cultivator. After applying the PPI treatments the entire plot area was field cultivated twice to a depth of 3 to 4 inches with the implement operated at a very slight angle to the length of the plot. 'Hyola 401' hybrid canola was treated with granular carbofuran and benomyl and planted at a seeding rate of 12 viable seeds/ft^2 on May 30. After planting the canola, a single row of barley, wheat and oat was planted across the end of each plot, perpendicular to the canola row direction, to allow us to evaluate control of these species without influencing canola yield. These strips were cut off while end trimming plots prior to harvest. A hand-weeded check was included in this study but the data for this treatment was deleted since the plots were not hand-weeded in a timely manner. Treatment information, environmental conditions and crop and weed sizes are listed below:

Date	May 30	June 4	June 18	June 25
Treatment	PPI	PRE	POST I	POST II
Temperature (F)				
air	60	64	70	77
soil (4 inch)	60	65	68	71
Relative humidity (%)	50	60	60	60
Wind (mph:direction)	5:SW	5:W	5-10:SE	10:NW
Sky	clear	clear	p. cloudy	p. cloudy
Soil moisture	moist	wet	moist	dry
Canola				
leaf no.	--	--	2-3	4-5
height (in)	--	--	2-3	5-6
Wild mustard				
leaf no.	--	--	2-3	3-4
height	--	--	2-3	4-6
infestation (plants/ft^2)				
Rainfall after application (in)				
1st week	0.96	0.0	1.01	1.30
2nd week	0.0	0.52	1.30	0.20
3rd week	0.62	1.01	0.20	0.10

Canola injury (stunting) with PPI and PRE treatments were less than 10% except for ethalfluralin and acetachlor which gave 14 and 18% injury on June 25, respectively. Canola injury was observed with POST I dicamba and endothall. When rated 7 days after POST I application, dicamba at 0.063 lb/A, following trifluralin 0.75 lb/A PPI, gave significantly more crop injury (stunting and epinasty) than was observed with the weedy check. Injury from dicamba was also observed on June 30. Both POST I and POST II endothall at all rates of application caused significant leaf burning compared to the weedy check. Tank mixing endothall at 0.375 lb/A with either quizalofop 0.055 lb/A or sethoxydim 0.2 lb/A plus 0.25% nonionic surfactant resulted in significantly more canola injury than was observed when endothall was applied alone at POST I. Other postemergence treatments applied alone or as tank mixtures generally did not cause significant canola injury. The only weed species that was present in this trial was wild mustard. Ethametsulfuron at 0.019 lb/A + 0.25% nonionic surfactant applied POST I, following PPI trifluralin, as a tank mixture with quizalofop applied POST I or as a POST II application following POST I quizalofop were the only treatments that resulted in good to excellent control of wild mustard. Although

ethametsulfuron gave very good control of wild mustard, maximum control with the treatment was not achieved for 3 to 4 weeks after application. The only treatments that gave adequate control of barley, oat and wheat were those that included either quizalofop or sethoxydim as a treatment. The highest canola yields were observed with treatments that included ethametsulfuron applied at POST I. Early season canola injury from dicamba and endothall did not reduce canola yield. [MN Agric. Exp. Sta. Paper No. 97-1-13-0045. Misc. Journ. Series, University of Minnesota, St. Paul, MN.]

Table. Evaluation of preplant, preemergence and postemergence herbicides for weed management in canola in 1997 (Lueschen, Oelke, Levorson, LeGare, Ristau, and Andol).

Treatments	Rate	Canola		Wild mustard		Barley	Wheat	Oat	Yield
		6/25	6/30	6/30	7/15	6/30	6/30	6/30	
	(lb/A or %)	(%)							(lb/A)
PPI									
Ethalfluralin	0.95	14	13	13	30	53	53	53	1281
Pendimethalin	1.24	10	11	11	30	48	50	48	1394
Trifluralin	0.75	10	11	11	24	53	60	55	1220
Trifluralin	1.0	9	9	9	20	40	40	40	1417
PPI trifluralin 0.75/POST I as follows									
Clopyralid	0.125	8	9	10	46	45	45	45	1423
Dicamba	0.063	27	19	18	43	45	48	45	1136
Endothall	0.375	16	10	10	40	48	53	45	1399
Endothall	0.56	24	13	13	29	58	58	58	1403
Endothall	0.75	26	15	15	46	55	60	55	1456
Endothall	1.125	33	16	18	48	60	58	60	1454
Sethoxydim+COC	0.2+1.25%	16	13	13	13	78	78	78	1247
Quizalofop+COC	0.055+1.0%	9	10	10	30	73	73	73	1221
Ethametsulfuron+NIS	0.019+0.25%	13	11	25	94	53	53	53	1739
Preemergence									
Metolachlor	2.44	0	10	10	30	40	45	40	1333
Dimethenamid	1.41	8	10	10	26	35	35	35	1103
Acetochlor+dichlormid	2.4	18	13	16	43	50	53	50	1263
POST I (weeds 2-3 inches tall)									
Clopyralid	0.125	4	10	10	32	45	43	43	1262
Endothall	0.56	15	9	10	53	43	45	43	1643
Sethoxydim+COC	0.2+1.25%	5	6	6	15	73	73	73	1398
Quizalofop+COC	0.055+1%	6	13	11	25	65	65	65	1073
Sethoxydim+endothall +NIS	0.2+0.375+0.25%	29	18	16	13	75	75	75	1355
Quizalofop+endothall +NIS	0.055+0.375+0.25%	26	13	13	8	60	60	60	1513
Sethoxydim+clopyralid +NIS	0.2+0.125.0.25%	4	10	13	14	60	60	60	1394
Quizalofop+clopyralid +NIS	0.055+0.125+0.25%	3	9	9	41	75	75	75	1490
Quizalofop+ethametsulfuron									

+NIS	0.055+0.019+0.25%	10	8	38	95	88	88	88	1689
POST I (weeds 2-3 inches tall)/POST II (weeds 5-6 inches tall)									
Sethoxydim+NIS/ endothall	0.2+0.25%/0.375	-	17	19	46	70	70	70	1499
Sethoxydim+COC/ endothall	0.2+1.25%/0.375	-	18	16	25	83	80	83	1477
Quizalofop+COC/ endothall	0.055+1%/0.375	-	18	18	28	78	78	78	1342
Quizalofop+NIS/ endothall	0.055+0.25%/0.375	-	23	20	35	80	80	80	1160
Quizalofop+COC/ ethametsulfuron	0.055+1%/0.019+0.25	-	14	33	84	80	80	80	1471
Hand-weeded check		5	9	0	0	0	0	0	1255
LSD (P=.10)		7	4	5	24	14	14	13	278

[a]Treatments: acetochlor + dichloramid=Surpass 6.4E; clopyralid=Stinger 3L; Dicamba=Banvel 4l; dimethanamid=Frontier 7.5E; endothall=Herbicide 273 3\L; ethametsulfuron=Muster 75DF, metolachlor=DUAL II 7.8E; pendimethalin=Prowl 3.3 E; quizalofop=Assure II 0.88E; sethoxydim = Poast 1.53E; trifluralin=Treflan 4E and NIS=nonionic surfactant Spray Boosters from Cenex Land O'Lakes.