Pea herbicide management trial at Waseca, MN - 1997. Becker, Roger L., Vincent A. Fritz, James B. Hebel, and Douglas W. Miller. The objective of this experiment was to evaluate weed control and pea injury with several soil applied and postemergence herbicides. This study was conducted on a Webster clay loam soil with pH 6.4. A randomized complete block design with three reps was utilized. Plot size was 10 feet by 20 feet. 'Columbia' peas were seeded at 550,000 plants/A on May 13, 1997. Herbicide application data are provided below. Peas were harvested on July 22, 1997 from a 42 by 110 inch area within each plot. Weed control and pea harvest data are provided in the table below.

Application Data

Treatment	PPI	PRE	POST
Date	5/13/97	5/13/97	6/17/97
Air Temp (°F)	40	48	62
Sky	partly cloudy	cloudy	sunny
Wind (mph)	S 0-4	SE 5-7	SE 12-14
Gift			
Density (#/ft^2)	--	--	15-25
Size (inch)	--	--	2-4
Cocb			
Density (#/ft^2)	--	--	0.09
Size (inch)	--	--	2-4
Vele			
Density (#/ft^2)	--	--	0.5
Size (inch)	--	--	2-4
Rainfall before Application			
Week 1 (inch)	0.59	0.59	0.05
Rainfall after Application			
Week 1 (inch)	0.32	0.32	1.30
Week 2 (inch)	1.69	1.69	1.55

Precipitation averaged 1.5 inch below normal in April and minimal rainfall following application resulted in reduced performance of soil applied herbicides. Grass control was fair to good with all soil applied products. Giant foxtail pressure was very heavy and uniform throughout the trial area, while velvetleaf and cocklebur was very patchy resulting in high variability and high LSD values. Weed control was best expressed at the later rating (July 7, 1997) which will be discussed. There was no significant pea injury expressed by the later rating, so only the early evaluation (June 24, 1997) will be discussed.

The best giant foxtail control with soil applied products was obtained with dinitroaniline herbicides (trifluralin at 0.75 lb ai/A and pendimethalin at 1.5). Similar control was obtained with reduced rates of trifluralin (0.5) tank mixed with clomazone (0.5). Cocklebur and velvetleaf populations that developed when trifluralin or pendimethalin were used alone did not decrease pea yield. The encapsulated clomazone formulation (3 ME) was compared preemergence with preplant incorporated applications of the 4 EC formulation. Giant foxtail control, cocklebur suppression, and velvetleaf control did not differ between the two formulations compared at the 0.5 lb rate. Performance of the two clomazone formulations also did not differ used in combination with trifluralin preplant incorporated. Clomazone alone provided fair giant foxtail control, and considering the environmental conditions, performance only modestly improved with the addition of reduced rates of trifluralin. Clomazone alone provided fair to good control of velvetleaf and provided only suppression of cocklebur.

Sulfentrazone soil applied at 0.31 lb provided giant foxtail control that was equal to or less than that provided with clomazone (0.375 or 0.5), slightly lower compared with metolachlor (3.0), and considerably lower when compared with trifluralin or pendimethalin used alone. Velvetleaf control or cocklebur suppression with sulfentrazone did not differ when compared with clomazone at either clomazone use rate. Sulfentrazone caused slight pea leaf necrosis, but this injury did not persist into the July rating period.

Imazamox (0.032) and imazethapyr (0.047) provided excellent and good foxtail control, respectively. Both products provided excellent control of cocklebur and velvetleaf with no visible crop injury. There was no yield reduction with use of either herbicide at these use rates. The use of both imazamox and imazethapyr resulted in the lowest tenderometer readings (154 and 173, respectively) but the significance or expected outcomes with earlier harvest targeting tenderometer readings around 100 cannot be determined from this study. Pea harvest was later than the desired maturity in this study with tenderometer readings typically in the 190's to 200 range.

Sethoxydim (0.15) and quizalofop (0.096) both provided excellent grass control, no control of broadleaf weeds, and caused no injury to pea. CGA 248757 (Action) was compared at two postemergence rates sequential to trifluralin preplant incorporated underlay treatments. Tank mixing bentazon (1.0) with CGA 248757 (0.0036) improved cocklebur control compared with the higher rate of CGA 248757 (0.0045) used alone, either treatment resulted in excellent velvetleaf control. The reduced CGA 248757 rate tank mixed with bentazon reduced pea growth reduction and leaf necrosis injury (June rating) compared with the higher CGA 248757 rate used alone. There was no significant decrease in yield with the higher rate of CGA 248757 used alone compared with the lower use rate tank mixed with bentazon, although trends showed a potential for yield reduction. Bentazon (1.0) provided excellent velvetleaf and cocklebur control applied sequentially to trifluralin, and caused no crop injury resulting in some of the highest pea yields. MCPA (0.375 lb ae/A) provided fair cocklebur and velvetleaf control and no visible injury when tank mixed with trifluralin, also resulting in excellent pea yields. (Dept. Of Agronomy and Plant Genetics, University of Minnesota, St. Paul).

Table. Pea herbicide weed management trial at Waseca, MN - 1997. (Becker et al.)

		Weed control						Pea injury					
		Gift		Cocb		Vele		G.R.[1]		Necrosis		Pea harvest	
Treatment[2]	Rate[2]	6/24	7/7	6/24	7/7	6/24	7/7	6/24	7/7	6/24	7/7	Tend.[3]	Yield
	(lb ai/A)	(%)											(Cwt/A)
Preplant Incorporated													
Trifluralin	0.75	87	82	0	0	10	10	0	0	0	0	200	53.7
Pendimethalin	1.5	89	83	0	0	54	42	2	0	0	0	194	43.5
Clomazone	0.375	60	45	30	60	73	77	2	0	0	0	197	35.1
Clomazone	0.5	70	58	38	33	83	71	3	0	0	0	195	44.1
Clomazone + trifluralin	0.375 + 0.375	83	69	10	28	68	62	2	0	0	0	198	55.2
Clomazone + trifluralin	0.5 + 0.5	84	78	20	15	75	70	0	0	0	0	196	49.2
Preplant Incorporated and (Preemergence)													
Trifluralin + (clomazone)	0.375 + (0.375)	85	78	30	47	68	75	0	0	0	0	190	29.8
Preemergence													
Clomazone	0.5	68	63	0	30	60	74	0	0	0	0	198	43.7
Sulfentrazone	0.31	52	43	12	45	75	73	0	0	3	0	198	31.0
Metolachlor & safener	3.0	77	70	0	0	30	0	0	0	0	0	197	33.3
Postemergence													
Imazamox + NIS[4] + 28%N[5]	0.032 + 0.25% + 1.25%	58	92	32	98	72	98	0	0	0	0	154	45.1
Imazethapyr + NIS + 28%N	0.047 + 0.25% + 1.25%	63	84	30	99	80	96	0	0	0	0	173	41.3
Sethoxydim + COC[6]	0.15 + 1.0%	64	96	0	0	0	0	0	0	0	0	195	45.7
Quizalofop + COC	0.096 + 1.0%	74	90	0	0	0	0	0	0	0	0	194	42.6
Preplant Incorporated and (Postemergence)													
Trifluralin + (CGA 248757 + COC)	0.375 + (0.0045 + 1.25%)	75	62	92	75	99	96	8	0	32	0	186	36.9
Trifluralin + (CGA 248757 + bentazon + COC)	0.375 + (0.0036 + 1.0 + 1.25%)	76	61	95	95	99	96	3	0	17	0	196	46.3
Trifluralin + (bentazon + COC)	0.375 + (1.0 + 1.25%)	78	64	90	96	89	93	0	0	0	0	192	55.2
Trifluralin + (MCPA[7])	0.375 + (0.0375)	80	68	40	63	40	43	0	0	0	0	182	53.1
Handweeded check		100	100	100	100	100	100	0	0	0	0	186	39.7
Weedy check		--	--	--	--	--	--	0	0	0	0	196	30.4
LSD (0.05)		12	15	32	33	25	29	3	ns	3	ns	17	15.1

[1] G.R. = Growth reduction.
[2] Treatments and rates in parenthesis represent a separate application.
[3] Tend. = Tenderometer reading (relative scale of measure).
[4] NIS = Class Preference nonionic surfactant.
[5] 28%N = 28% UAN fertilizer solution.
[6] COC = Class Crop Oil Concentrate.
[7] Chiptox MCPA sodium salt amine.