Pea herbicide management trial at Waseca, MN - 2002. Becker, Roger L., Vincent A. Fritz, James B. Hebel, Douglas W. Miller, and Bradley D. Kinkaid. 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. A randomized complete block design with three reps was utilized. Plot size was 10 feet by 20 feet. 'Brule 297' peas were seeded at 550,000 plants/A on May 17, 2002. Herbicide application data are provided below. Weed control and injury data are provided in the tables below.

Application Data

Treatment	PPI	PRE	POST
Date	5/17/02	5/21/02	6/14/02
Air Temp (°F)	44	46	74
Sky	partly cloudy	clear	partly cloudy
Wind (mph)	NE 8	SW 10	NW 12
Weed Size (inch)			
Gift	--	--	0.5-4.0
Broadleafs	--	--	0.5-2.0
Rainfall before Application			
Week 1 (inch)	0.41	0.00	1.28
Rainfall after Application			
Week 1 (inch)	0.00	0.23	0.53
Week 2 (inch)	0.74	2.27	2.80

May temperatures were slightly cool (- 74 GGD_{b50}) and soil moisture conditions were 2.25 inches below normal for May. Following preplant incorporated and preemergence applications, it was 8 or 4 days, respectively, to the first rain of only 0.16 inch, 12 or 8 days to > 0.33 inch precipitation. However, June was warmer (+76 GGD_{b50}) and wetter (+2.93 inches) than normal following POST applications. A light rain, 0.04 inch, occurred later the day POST treatments were applied. All weed species were patchy thereby adding to variability in experimental error. Giant foxtail and common cocklebur were heavy pressure where patches occurred, common lambsquarter Powell amaranth, and velvetleaf light pressure scattered throughout. Flumioxazin was compared PPI and PRE at 0.047, 0.063 and 0.094 lb ai per acre. Giant foxtail control was similar to that obtained with standard trifluralin and pendimethalin treatments and was improved with PRE application at the low and middle rates compared to PPI. Flumioxazin provided suppression of common cocklebur and control of lambsquarter, Powell amaranth, and velvetleaf. Control of the broadleaf weeds present did not differ by application method though there was a trend for improve Powell amaranth control PRE.

Clomazone 3ME applied PRE had lower control of Powell amaranth compared to PPI applications. Clomazone in known to be weak on *Amaranthus* spp. with either application method. This finding, though significant (P=0.05), has not been seen in past trials specifically comparing application methods for clomazone and may be an anomaly due to light and sporadic pressure in this study. As in past trials, sulfentrazone at 0.19 provided excellent pea tolerance and broadleaf weed control with a slight weakness providing suppression, not control of the heavy cocklebur populations. In addition to broadleaf control, sulfentrazone provided suppression of giant foxtail. MCBP continues too provide excellent weed control of all weed species without pea injury and excellent pea yield

Imadazolinones imazamox and imazethapyr gave excellent control of all weed species POST, though resulted in delayed maturity which did not occur with PPI imazethapyr in the package mixture with pendimethalin, any other herbicide treatments, or with competition from weedy checks. This trend was evident in past studies, but never was as pronounced as in this trial. Pendimethalin &imazethapyr package mixture gave the best weed control with soil applied treatments, but reduced control of common cocklebur compared to POST applications of imazethapyr. It has been noted previously that imazethapyr is most active on large seeded broadleaf weed species with POST applications.

The addition of COC to bentazon increased early leaf necrosis from 4 to 12 % leaf burn, but resulted in no discernable (significant) growth reduction or stand loss. Yield, however was reduced compared to 18 of the 24 treatments including that of bentazon without the addition of COC. This did not

occur in the past when comparing bentazon plus COC with or without CGA 248757 (then called Action). Since it was felt that Action needed additives to improve the spectrum of weed control, bentazon alone was applied with crop oil concentrate to allow comparison to Action alone and in tank mixtures. The addition of crop oil to bentazon caused injury in these past trials, injury which seemed to persist longer than the growth reduction caused by Action alone. However, in past trials, pea yields showed a nonsignificant trend towards lower yields with the bentazon injury. This year, bentazon + COC clearly reduced yields due to the addition of COC. (Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul).

Table 1. Pea herbicide weed management trial at Waseca, MN - 2002. (Becker et al.)

		Weed control									
		SETFA		XANST		CHEAL		AMAPO		ABUTH	
Treatment[1]	Rate[1]	6/19	7/9	6/19	7/9	6/19	7/9	6/19	7/9	6/19	7/9
	(lb ai/A)	---------- (%) ----------									
Preplant Incorporated											
Trifluralin	0.75	88	87	38	28	93	92	90	92	37	48
Pendimethalin	1.5	76	81	40	53	93	78	95	92	50	48
Clomazone[2]	0.5	74	82	55	38	73	79	95	93	75	94
Pendimethalin + clomazone[2]	0.63 + 0.5	88	88	82	72	85	86	95	96	92	95
Pendimethalin & imazethapyr[3]	0.63 + 0.047	83	91	89	76	93	95	95	95	93	95
Pendimethalin + flumioxazin	0.63 + 0.063	65	73	43	51	85	90	95	95	62	58
Flumioxazin	0.047	35	53	92	60	90	85	88	85	93	95
Flumioxazin	0.063	63	71	80	63	95	95	95	83	87	95
Flumioxazin	0.094	80	75	62	61	93	80	90	95	95	95
Preemergence											
Clomazone[2]	0.5	90	92	75	50	90	93	60	53	80	95
Sulfentrazone	0.19	42	60	73	66	93	96	90	95	84	80
s-metolachlor & CGA-154281[4]	1.91	94	98	45	50	77	73	86	70	71	50
Flumioxazin	0.047	78	76	92	59	95	95	95	95	88	86
Flumioxazin	0.063	71	82	88	67	92	85	90	95	93	95
Flumioxazin	0.094	92	83	77	61	95	95	95	95	95	95
s-metolachlor & CGA-154281 + flumioxazin	1.91 + 0.063	93	96	76	53	95	95	95	95	93	95
Postemergence											
Imazamox + NIS[5] + 28%N[6]	0.032 + 0.25% + 1.25%	--	98	--	99	--	99	--	98	--	99
Imazethapyr + NIS + 28%N	0.047 + 0.25% + 1.25%	--	99	--	99	--	99	--	98	--	99
Quizalofop-P + COC[7]	0.083 + 1.0%	--	99	--	--	--	--	--	--	--	--
Preplant Incorporated and (Postemergence)											
Pendimethalin + (bentazon + COC)	1.5 + (1.0 + 1.25%)	80	76	49	94	0	96	0	96	25	96
Pendimethalin + (bentazon)	1.5 + (1.0)	83	77	67	96	0	96	0	93	22	96
Pendimethalin + (MCPB)	1.5 + (0.75)	91	80	49	97	0	96	0	93	19	96
Quizalofop-P + COC + Handweeded	0.083 + 1.0%	100	100	100	100	100	100	100	100	100	100
Weedy check		--	--	--	--	--	--	--	--	--	--
LSD (0.05)		13	10	ns	26	19	ns	10	15	32	22

[1] Treatments and rates in parenthesis represent a separate application.
[2] Command 3ME
[3] Premix = Pursuit Plus 2.9E.
[4] Dual II Magnum.
[5] NIS = Class Preference nonionic surfactant.
[6] 28%N = 28% UAN fertilizer solution.
[7] COC = Class Crop Oil Concentrate.

Table 2. Pea herbicide weed management trial at Waseca, MN - 2002. (Becker et al.)

		Pea Injury					
		Necrosis	Growth Reduction		S.R.[1]	Pea Harvest	
Treatment[2]	Rate[2]	6/19	6/19	7/9	7/9	Tend.[3]	Yield
	(lb ai/A)	---------- (%) ----------					(Cwt/A)
Preplant Incorporated							
Trifluralin	0.75	0	0	0	0	135	27.2
Pendimethalin	1.5	0	0	2	2	133	26.9
Clomazone[4]	0.5	0	0	0	1	138	27.3
Pendimethalin + clomazone[4]	0.63 + 0.5	0	0	0	1	141	31.0
Pendimethalin & imazethapyr[5]	0.63 + 0.047	0	0	0	1	141	36.8
Pendimethalin + flumioxazin	0.63 + 0.063	0	0	0	0	139	24.9
Flumioxazin	0.047	0	0	0	0	147	25.9
Flumioxazin	0.063	0	0	0	0	148	30.4
Flumioxazin	0.094	0	0	4	1	146	32.2
Preemergence							
Clomazone[4]	0.5	0	0	2	2	135	31.3
Sulfentrazone	0.19	0	0	0	0	143	26.0
s-metolachlor & CGA-154281[6]	1.91	0	0	2	0	156	35.5
Flumioxazin	0.047	0	0	0	0	148	28.6
Flumioxazin	0.063	0	0	0	0	140	30.1
Flumioxazin	0.094	0	0	3	1	145	27.6
s-metolachlor & CGA-154281 + flumioxazin	1.91 + 0.063	0	0	0	0	141	32.8
Postemergence							
Imazamox + NIS[7] + 28%N[8]	0.032 + 0.25% + 1.25%	0	0	0	3	89	32.2
Imazethapyr + NIS + 28%N	0.047 + 0.25% + 1.25%	0	0	0	3	89	32.4
Quizalofop-P + COC[9]	0.083 + 1.0%	0	0	0	0	140	34.6
Preplant Incorporated and (Postemergence)							
Pendimethalin + (bentazon + COC)	1.5 + (1.0 + 1.25%)	12	0	2	3	124	17.1
Pendimethalin + (bentazon)	1.5 + (1.0)	4	0	0	0	131	29.0
Pendimethalin + (MCPB)	1.5 + (0.75)	0	0	0	0	147	32.6
Quizalofop + COC + Handweeded	0.083 + 1.0%	0	0	0	0	144	29.3
Weedy check		0	0	0	0	142	14.7
LSD (0.05)		1	ns	ns	ns	14	10

[1] S.R. = Stand reduction.
[2] Treatments and rates in parenthesis represent a separate application.
[3] Tend. = Tenderometer reading (relative scale of measure).
[4] Command 3ME
[5] Premix = Pursuit Plus 2.9E.
[6] Dual II Magnum.
[7] NIS = Class Preference nonionic surfactant.
[8] 28%N = 28% UAN fertilizer solution.
[9] COC = Class Crop Oil Concentrate.