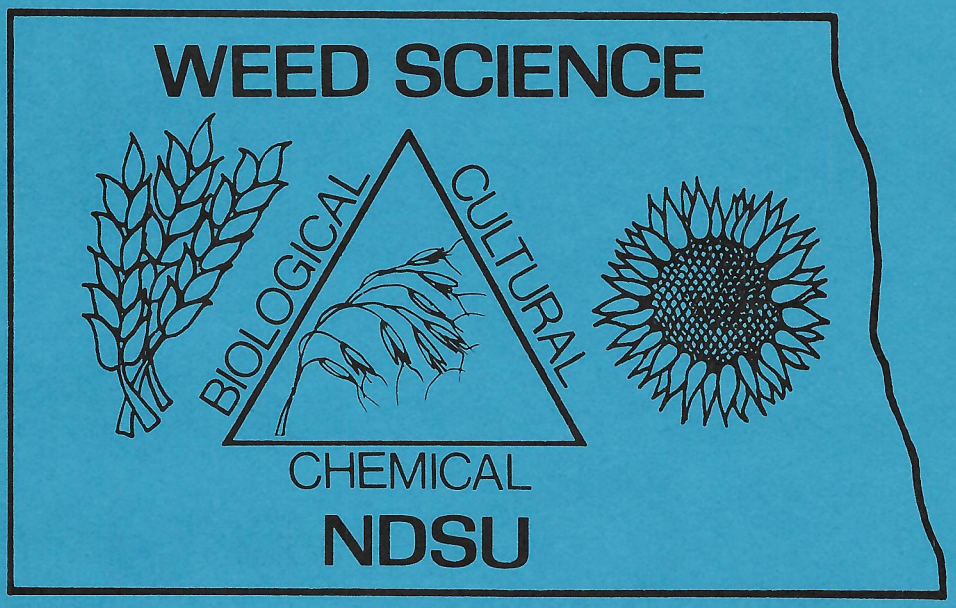
1982
NORTH DAKOTA
WEED CONTROL
RESEARCH



Weed Research Projects, Department of Agronomy
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Not for publication

SUMMARY OF 1982
WEED CONTROL TRIALS

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CLIMATIC DATA - FARGO

Date	Precipitation						Temperature											
	April	May	June	July	Aug.	Sept.	April		May		June		July		Aug.		Sept.	
							Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1							43	26	77	44	61	37	80	52	91	50	82	50
2	.13			.09	T		43	16	80	47	66	33	79	66	102	66	74	49
3	.01	T	T				20	10	87	60	71	49	91	58	88	61	80	44
4		.01					26	10	77	51	75	47	94	63	95	58	90	56
5			T	T			27	18	65	45	74	57	93	66	92	64	71	48
6			.47	T			30	12	65	31	69	56	76	59	91	69	70	43
7			T		.38	T	36	24	58	28	59	45	73	56	87	61	77	52
8	T	T	.05	1.12	T		34	24	65	31	58	42	84	57	72	56	87	61
9	T	.52	.54	.35			42	28	61	47	60	45	75	63	68	46	84	63
10	T	.14		T			38	27	64	49	70	41	73	57	72	43	89	63
11		.01				.08	48	28	54	44	72	45	82	54	78	51	73	58
12	.09	.05			.02	.29	50	36	59	47	72	39	86	57	73	59	58	44
13	T	.01		.05	T		51	28	60	48	79	49	78	62	85	65	61	39
14	.11	.49	.17	.03		.14	63	42	65	53	77	56	84	58	79	64	52	45
15	.01	.09		.01		.19	71	46	71	59	71	44	83	69	87	64	57	44
16		.07	T	.30	.25	.12	53	33	70	56	78	52	87	68	85	60	58	41
17		.18		.05	.06	T	57	29	71	56	68	49	78	56	87	66	62	41
18		.04			.02		62	36	63	53	67	45	76	54	94	69	75	36
19		T	.02	.54		T	51	33	63	49	72	40	77	59	81	60	54	42
20				T			48	25	68	46	71	48	91	65	84	50	60	31
21					.20		55	29	67	40	75	45	81	61	91	62	68	36
22					T	T	70	29	75	40	77	41	84	55	77	59	77	45
23			.04			T	83	40	76	49	91	60	89	68	72	55	68	49
24		.01	T	T	T		83	51	70	56	72	46	84	64	74	53	61	37
25		T		.08	.01		58	32	68	58	72	41	80	60	75	49	62	30
26					.02		58	24	74	50	78	51	81	58	67	43	72	46
27			T	T	.01	.07	63	32	77	54	82	59	80	56	66	33	66	45
28		T	.32			.23	66	40	77	55	65	48	82	55	69	51	75	50
29	.10	.06		.02			62	37	70	52	72	43	76	58	75	51	60	43
30	T	.14			.11		69	37	56	48	75	46	83	53	61	43	57	34
31				T	.04				59	41			86	62	76	56		

CLIMATIC DATA - CASSELTON

Date	Precipitation					
	April	May	June	July	Aug.	Sept.
1						
2						
3						
4						
5						
6			.40			
7					.65	
8		.10	.40	.50		
9		.38		.05		
10		.43				
11						.30
12						.49
13	.28		.15			
14				.19		
15		.62				
16		.65		.31	.35	
17		.25			1.10	
18				.60		
19						
20						
21					.45	
22						
23			.05			
24		.48			.05	
25						
26						
27						
28		.25	.30			
29	.10					
30		.20				
31						

CLIMATIC DATA - CROOKSTON

Date	Precipitation						Temperature											
	April	May	June	July	Aug.	Sept.	April		May		June		July		Aug.		Sept.	
							Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1						.01	38	17	67	39	54	40	73	49	83	59	77	48
2	.45						38	32	76	39	59	36	79	61	84	62	80	48
3	.06			T	T		32	7	79	56	64	43	79	62	89	63	72	38
4		1.00					23	6	82	58	71	44	88	60	81	57	78	45
5		.08		.55			24	16	70	44	76	56	844	65	87	58	89	48
6			.04	T	.78		27	13	62	39	74	63	86	59	82	65	68	40
7			.52				36	23	64	31	66	52	77	55	84	60	69	45
8		.01					36	26	56	30	57	47	72	56	84	57	73	54
9			.71	.32	.03		39	30	58	38	55	47	80	59	71	46	86	62
10	.02	.50	.13	.18			38	23	57	45	57	43	71	59	67	43	83	59
11		.22	.01				47	26	57	43	69	51	75	52	71	43	87	64
12	.12						51	37	53	45	70	41	81	55	76	53	70	54
13		.03			.07	.40	47	30	56	48	73	50	87	62	73	61	58	37
14			.03				63	37	58	49	81	54	77	58	86	63	59	41
15		.22					66	43	59	55	76	44	85	64	79	65	52	44
16	.03	.71		T			66	39	74	56	70	45	84	61	86	59	57	39
17		.23		.06	.33	.33	52	30	68	55	77	52	83	56	79	58	55	43
18				T		.08	58	34	62	53	66	47	77	52	85	63	60	39
19		.02		.38	.03		56	31	58	51	65	42	78	55	91	63	75	42
20			.11	.07			54	26	58	42	68	46	75	58	83	51	53	31
21			T	1.22			55	32	63	41	68	45	90	61	83	57	58	31
22					.14		70	32	64	41	70	41	79	53	87	57	67	38
23			.05		.17	.01	81	40	73	44	72	51	80	59	78	53	75	49
24			.02	.14	T		82	45	75	53	84	57	87	68	73	50	62	38
25							82	37	72	58	65	40	82	57	71	47	59	28
26				T	T		56	27	72	50	71	47	80	58	67	40	60	36
27			.17				61	33	78	52	77	58	80	57	64	35	69	44
28			.10			.61	64	42	80	53	79	53	80	54	63	37	55	49
29		.08	.60	.35		.06	64	37	79	49	62	44	83	57	70	51	68	45
30	.09			.01			67	39	72	46	69	45	75	54	72	38	55	37
31		.06			T				57	43			82	58	58	48		

CLIMATIC DATA - MINOT

	Precipitation						Temperature											
							April		May		June		July		Aug.		Sept.	
Date	April	May	June	July	Aug.	Sept.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1					T		33	19	67	37	66	38	73	48	91	57	77	48
2							35	17	77	43	68	41	8	54	93	69	73	46
3	.08						18	3	82	54	71	44	82	59	87	53	76	46
4	T			.07		T	22	0	88	47	71	48	86	62	89	55	84	52
5	.12		.04	.25			22	7	65	35	76	50	87	59	85	55	81	45
6			T				24	6	61	35	79	55	79	55	90	57	70	42
7	T	T	1.05	T			31	19	42	26	67	47	72	50	88	63	79	47
8	T		.13	.07			31	20	50	25	65	45	74	48	80	52	88	48
9	T	.38	1.82	.70	.23		38	26	45	27	50	42	77	55	70	44	92	56
10	T	.46	.02	T	.14		35	13	44	35	68	40	73	55	70	43	94	58
11		.02		T			37	17	45	34	72	42	80	57	72	42	97	53
12	T			T		T	57	35	54	39	72	45	82	60	81	50	74	51
13		.04		.52	.11		57	31	58	45	75	46	86	58	82	51	74	41
14	.10	T	.02			.02	63	36	59	47	80	52	78	58	86	53	61	41
15	.07	.78			.02		71	34	70	47	76	49	79	58	90	57	54	29
16	.03	.46	.02		T		55	33	54	47	78	55	86	64	81	54	61	30
17		.63	113	T			53	29	55	48	81	47	89	53	88	57	66	38
18		T	.02		.05		59	32	56	47	55	47	75	49	90	58	68	39
19			.03	T	.09		65	31	62	49	66	48	79	56	94	59	79	39
20							48	24	65	46	73	45	86	56	83	54	57	31
21					T		50	28	59	43	74	48	86	56	86	54	65	33
22		T			T		55	35	67	44	75	51	79	55	91	51	73	42
23				.04	.03		72	44	71	45	84	54	82	58	75	49	76	48
24		.70	.03	T	.01		83	48	74	43	83	50	88	63	70	44	72	32
25							77	37	68	43	71	46	84	60	73	44	65	32
26					T	T	46	26	73	44	74	47	83	58	60	36	71	46
27			.09	.19	T	.06	59	28	78	51	83	55	82	53	64	32	68	42
28			1.50		T	2.13	63	38	67	54	81	56	80	56	59	31	52	40
29		.40	.08		T	.49	64	39	75	39	63	46	81	53	81	51	52	34
30		T			.17	.01	52	36	61	36	68	47	77	51	76	47	49	29
31	.03	.01			.36				56	37			86	53	53	42		

CLIMATIC DATA - WILLISTON

Date	Precipitation						Temperature											
							April		May		June		July		Aug.		Sept.	
	April	May	June	July	Aug.	Sept.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1							40	20	77	38	67	43	79	53	91	64	74	45
2	.28		T				39	10	87	48	70	43	79	57	91	74	79	48
3							20	0	86	51	71	42	88	56	91	55	86	49
4	T			.02			21	6	84	42	77	46	88	58	90	51	85	58
5	.12	T	.29	.33	.08		25	10	56	34	76	47	83	57	92	61	80	48
6		.05	.32		.70	.10	32	13	53	29	74	52	75	55	92	64	76	47
7	T				.10		32	24	49	24	62	45	79	50	87	60	90	53
8	.01	.15	.73	.06			37	20	49	32	63	47	79	57	78	50	92	52
9		.05	.11	.16			37	26	40	35	66	39	66	52	75	49	91	54
10		.33					51	14	41	39	72	40	80	54	76	40	91	61
11		.17	T			.03	66	28	52	38	72	49	83	57	83	59	80	49
12	.01				T		63	35	57	44	76	47	84	59	82	63	70	42
13							67	35	67	40	81	53	84	54	90	53	68	38
14	T			.06	T		70	38	72	45	81	54	81	62	94	63	55	41
15	T	.59		T			61	36	72	47	78	52	79	59	94	54	62	30
16		.37					52	29	55	46	78	55	76	60	90	61	64	43
17		.01					57	28	58	48	74	50	75	48	91	61	70	35
18					.04		59	28	63	49	68	40	82	51	95	63	78	48
19	.65	.05					42	29	67	47	72	53	88	57	94	59	75	37
20	T						43	23	60	41	76	48	89	60	93	54	64	35
21		.05					56	30	38	48	80	49	86	56	92	64	82	41
22				T	.06		74	35	71	42	88	55	92	57	89	54	80	41
23		.14			.05		78	42	70	48	88	65	93	66	71	49	74	41
24		.01					77	42	58	42	80	47	87	58	73	48	72	37
25							61	34	72	40	77	48	85	57	73	51	81	45
26			.09		.05		58	27	78	48	84	56	82	55	64	40	81	44
27				1.04		1.70	63	30	78	52	82	56	82	56	60	35	68	39
28		.87	1.28	.04		.67	70	36	70	58	82	60	83	57	86	48	42	36
29		.77					68	42	62	35	68	52	83	54	85	52	43	31
30		.08	.03		.73	T	66	32	50	36	72	47	89	52	72	40	43	30
31				.03					66	34			90	57	76	45		

CLAMATIC DATA - LANGDON

	Precipitation						Temperature											
							April		May		June		July		Aug.		Sept.	
Date	April	May	June	July	Aug.	Sept.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1							28	13			55	36	70	50	85	55	75	41
2	T					.04	30	15			60	37	78	60	77	55	71	44
3	.10			.03			26	0			63	40	78	55	83	52	71	42
4				T			18	-1			74	45	85	57	84	57	79	46
5			.05	1.50			18	6			68	55	87	59	80	53	76	42
6			.45	T	.94		23	5			63	53	77	53	80	61	73	41
7			.92				28	14			62	47	71	46	78	61	72	45
8						.13	30	23			53	41	70	48	76	54	81	50
9			.55	.18	.05		32	26			46	40	72	54	64	46	87	59
10	.04		.11				37	11			63	41	70	55	62	38	90	55
11				.05			33	21			69	45	76	53	67	44	66	42
12	.05					T	50	30			65	39	78	42	74	50	62	38
13				.02	.04		54	27			72	48	84	51	66	41	100	38
14			.35		T		47	31			79	46	71	50	80	55	52	28
15	T			.50	.11		64	31			69	44	78	50	81	60	56	30
16							61	31			68	49	84	62	77	52	56	40
17			.25	.10		T	49	27			75	42	79	51	77	55	58	40
18					.03		53	29			57	40	72	44	82	60	75	36
19			.12				53	27			56	38	71	52	88	55	50	28
20			.03			.02	44	22			63	40	76	60	80	51	61	29
21			T	.12	.13		50	28			65	43	85	55	82	56	70	34
22					.05		51	31			68	42	80	50	75	49	76	45
23						T	70	37			68	51	74	56	72	44	55	32
24			.40	.73			80	39			79	52	82	64	72	44	58	30
25							79	34			70	38	78	56	73	48	65	40
26							47	22			68	40	76	51	59	33	62	42
27			.15				56	29			68	40	79	58	59	28	52	40
28			.15		T	1.08	63	32			75	42	76	50	61	33	58	34
29			.02	.16		.10	64	37			63	40	78	51	69	46	49	30
30	T						54	30			65	41	72	49	71	40		
31					.65								79	52	53	45		

CLIMATIC DATA - CARRINGTON

Date	Precipitation						Temperature											
	April	May	June	July	Aug.	Sept.	April		May		June		July		Aug.		Sept.	
							Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1						.04	38	22	77	34	64	40	80	49	85	50	77	48
2							38	15	80	49	69	37	83	64	91	51	77	45
3			.10				21	-2	87	55	74	47	88	57	99	63	82	40
4		.07					22	6	86	49	76	49	86	59	85	53	90	51
5	T		.02	.96			24	11	66	33	76	56	81	62	84	58	84	47
6			.25				29	14	64	36	72	54	78	57	86	61	85	37
7							33	20	53	28	59	44	74	51	83	63	83	49
8			.20		.12		33	26	59	25	60	43	82	53	72	49	94	61
9		.03	1.69	.75			34	25	52	38	66	41	82	52	68	47	93	66
10		.56					37	21	52	46	70	39	75	57	71	40	95	53
11	.15	.18	T				52	21	55	41	70	44	79	55	78	40	91	54
12	T				.19		56	39	55	41	72	41	87	57	78	58	62	43
13				.35			56	27	55	47	78	52	83	60	74	58	63	39
14			.04		.03		68	37	62	48	79	51	81	55	87	60	63	39
15	T	.48		.06	.70		63	36	67	51	75	45	84	64	81	61	60	33
16		.41		.05	.22	T	54	33	64	54	76	52	90	68	80	59	58	37
17		.17		.30	.14		59	30	60	51	76	49	91	50	91	60	63	41
18			.08				60	32	60	49	60	44	77	48	91	68	75	42
19			.04	.13			58	32	64	47	69	41	84	58	89	62	68	36
20	T						50	26	63	41	68	46	92	60	83	50	62	25
21				.08			53	25	69	42	70	45	78	64	92	57	73	31
22							70	32	73	41	79	48	79	53	86	54	80	31
23			.07				83	46	77	45	85	59	90	63	74	48	71	44
24		.30		.55			83	46	73	50	70	54	90	67	71	47	64	33
25				.01	T		73	40	74	46	70	53	79	51	71	52	72	29
26				T			57	25	75	50	70	44	80	55	70	40	70	38
27			.12			.54	63	31	74	49	79	52	77	59	70	30	69	45
28			.61	.32	T	.15	63	34	78	50	62	46	82	51	73	45	63	51
29	.07	*		.12		.08	59	37	72	42	66	47	80	53	73	47	58	34
30		.15			.29	.15	68	33	62	45	73	43	82	50	72	43	51	31
31					.29				60	38			84	59	77	49		

KEY TO ABBREVIATIONS AND EVALUATIONS

Crop injury, crop stand and weed control ratings are based on a visual estimate using a scale of 0 to 100 with 0 = no effect and 100 = complete kill.

All preplant incorporated or preemergence treatments were applied in 17 gpa of water and all postemergence treatments except barban were applied in 8.5 gpa of water at 35 psi. Barban treatments were applied in 4.7 gpa water at 45 psi.

All treatments were applied with a bicycle wheel-type plot sprayer unless otherwise stated in the table. Preplant incorporation was by field cultivator + harrow or as stated in table and preemergence incorporation was by harrowing twice.

In sugarbeet experiments, weeds were counted in 40 square feet of the treated four rows and in 20 square feet of each of the two row untreated areas on the sides of the treated area. Sugarbeets were counted in 60 feet of row in th treated area.

Treatments with a + indicates tank mixtures and with an α indicates formulation mixtures.

Species

Abwo = Absinth wormwood
Barl = Barley
Bdlf = Broadleaf
Bygr = Barnyardgrass
Cath = Canada thistle
Cobu = Common cocklebur
Colq = Common lambsquarter
Copu = Common purslane
Dobr = Downy brome
Fach = False chamomile
Flwe = Flixweed
Fxtl = Foxtail species
Grft = Green foxtail
Grpw (Gfpw) = Greenflower pepperweed
Howe = Horseweed
Kocz = Kochia
Lesp = Leafy spurge
Mael = Marshelder
Mats = Marestail
Mesa = Meadow salsify
Nfcf = Nightflowering catchfly
Pest (Soth) = Perennial sowthistle
Powe = Pondweed
Prlt = Prickly lettuce
Prpw = Prostrate pigweed
Rrpw = Redroot pigweed
Ruth = Russian thistle
Soyb (Sobe) = Soybean
Sugb (Sube) = Sugarbeet
Sunf (Sufl) = Sunflower
Tamu = Tansy Mustard
Taoa = Tame oat
Tumu = Tumble mustard
Tymu = Tame yellow mustard
VSF = Volunteer sunflower
Vwht = Volunteer wheat
Wht = Wheat
Wibu = Wild buckwheat
Wimu = Wild mustard
Wioa = Wild oats
Yeft = Yellow foxtail

Methods

PPI = Preplant incorporated
PEI = Preemergence incorporated
PE = Preemergence
P, PO, POST = Postemergence

Miscellaneous

DF = Dry flowable
F = Fall
FL (F) = Flowable
S = Spring
L = Liquid
G = Granules
Inc(I) = Incorporation
%ir = Percent injury rating
%sr = Percent stand reduction
HT = Plant height
DMA = Dimethylamine
DEA = Diethylamine
SOTM = Soybean oil with 5.5% TMULZ VO
TM, LOTM = Linseed oil with 5.5% TMULZ VO
MOIS = Percent moisture
OC = Petroleum oil concentrate(17% emulsifi
Popl = Population
SPK = Spike stage
SURF, S = Surfactant
TW = Test weight
WP = Wettable powder
WK = Surfactant by Dupont
X-77 = Surfactant by Ortho
Bivt = Bivert

LIST OF HERBICIDES TESTED IN 1982

Common Name or Code Name	Abbreviation[a]	Chemical Name	Trade Name
AC-222293	None	Not released	None
Acetochlor	Acet,MON 097	2-chlor-N(ethoxymethyl)-6'-ethyl-o-aceto-toluidide	None
Acifluorfen	Acif,MC10978	sodium 5- 2-chloro-4-(trifluoromethyl)-phenoxy -2-nitrobenzoate	Blazer, Tackle
Alachlor	Alac	2-chloro-2',6'-diethyl-N-(methoxymethyl) acetanilide	Lasso
Ametryn	Amet	2-(ethylamino)-4-(isopropylamino)-6-(methylthio)-s-triazine	Evik
Amitrole	Amit	3-amino-s-triazole+ammonium thiocyanate	Amitrole
Asulam	Asul	methyl sulfanilylcarbamate	Asulox
Atrazine	Atra	2-chloro-4-(ethylamino)-6-(isopropyl-amino)-s-triazine	AAtrex
Barban	Barb	4-chloro-2-butynyl-m-chlorocarbanilate	Carbyne
BAS-506 H	None	Not released	None
Benazolin	Bena	4-chloro-2-oxo-3-benzothiazoline acetic acid	None
BAS-9052 OH	None	2-(N-ethoxybutyrimidoyl)-5-(2-ethylthio-propyl)-3-hydroxy-2-cyclohexen-1-one	Poast
Bentazon	Bent	3-isopropyl-1H-2,1,3-benzothiadiazin-(4) 3H-one 2,2-dioxide	Basagran
Bifenox	Bife	methyl-5(2,4-dichlorophenoxy)-2-nitrobenzoate	Modown
Bromoxynil	Brox	3,5-dibromo-4-hydroxybenzonitrile	Brominal, Buctril
Buthidazole	Buth	3- 5(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl -4-hydroxy-1-methyl-2-imidazolidinone	Ravage
Butylate	Buty	S-ethyl diisobutylthiocarbamate	Sutan
Chloramben	Clam,Chlor	3-amino-2,5-dichlorobenzoic acid	Amiben
Chlorflurenol	None	methyl 2-chloro-9-hydroxyfluorene-9-carboxylate	Maintain
Chlorpropham	CIPC	isopropyl m-chlorocarbanilate	Furloe
Chlormequat chloride	CCC	(2-chloroethyl)trimethylammonium chloride	Cyclocel
Chlorsulfuron	Clsu	2-chloro-N (4-methoxy-6-methyl-1,3,5-triazine-2-yl)aminocarbonyl -benzene sulfonamide	Glean
Cyanazine	Cyan	2-. 4-chloro-6-(ethylamino)-s-triazine-2-yl amino -2-methylpropionitrile	Bladex
CGA-82725	None	2-propynl 2- 4(3,5-dichloro-2-pyridyloxy) phenoxy propanoate	None
Cycloate	Cycl	S-ethyl N-ethylthiocyclohexanecarbamate	Ro-Neet
Dalapon	Dala	2,2-dichloropropionic acid	Dowpon
Desmedipham	Desm	ethyl m-hydroxycarbanilate carbanilate	Betanex
Diallate	Dial	S-(2,3-dichloroally)diisopropylthio-carbamate	Avadex
Dicamba	Dica	3,6-dichloro-o-anisic acid	Banvel
Diclofop	Dicl	2- 4-(2,4-dichlorophenoxy)phenooxy propanoic acid	Hoelon

Common Name or Code Name	Abbreviation[a]	Chemical Name	Trade Name
Diethatyl	Diet	N-chloroacetyl-N-(2,6-diethylphenyl)-glycine ethyl ester	Antor
Difenzoquat	Dife	1,2-dimethyl-3,5-diphenyl-1H-pyrazolium	Avenge
Dinoseb	Dino,DNBP	2-sec-butyl-4,6-dinitrophenol	Dow General, Premerge
Diuron	Diur	3-(3,4-dichlorophenyl)-1,1-dimethylurea	Karmex
DOWCO 356	None	2-(3,5-dichlorophenyl)-2-(2,2,2-trichloroethyl)oxirane	Tandem
DOWCO 453	None	Methyl 2-(4-((3-chloro-5-trifluoromethyl)-2 pyridinyl)oxyphenoxy) propanoate	None
DPX-5648	None	2-Carbomethoxy-N- (4,6-dimethylpyrimidin-2-yl)aminocarbonyl benzenesulfonamide	Oust
DPX-T6376	None	Methyl 2- (4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino carbonyl amino sulfonyl benzoate	None
DPX-A5967	None	Not released	None
DPX-A5969	None	Not released	None
EL 187, Isouron	isou	N- 5-(1,1-dimethyl ethyl)-3isoxazoyl-N-N-dimethyl urea	Conserve
EL 5219	None	Oryzalin+trifluralin (1:1 mixture)	None
EL 8778	None	Isouron+atrazine (1:1 mixture)	None
Endothall	Endo	7-oxabicyclo 2,2,1 heptane-2,3-dicarboxylic acid	Herbicide 273
EPTC	None	S-ethyl dipropylthiocarbamate	Eptam
Ethalfluralin	Etha	N-ethyl-N-(2-methyl-2-prophenyl)-2,6-dinitro-4-(trifluromethyl) benzenamine	Sonalan
Ethepon	Ethe	2-chloroethylphosphonic acid	Etherel
Ethofumesate	Etho	2-ethoxy-2,3-dihydro-3,3-dimethyl-5-benzofuranyl methanesulfonate	Nortron
Flamprop	Flam	N-benzoyl-N-(3-chloro-4-florophenyl)-DL-alanine	Mataven
Fluchlorulin	Fluc	N-(2-chloroethyl)-2,6-dinitro-N-propyl-4-(trifluoromethyl)aniline	Basalin
FOE-2602	None	Not released	None
Glyphosate	Glyp	N-(phosphonomethyl)glycine	Roundup
Hexazinone	Hexa	3-cyclohexyl-6-(dimethylamino)-1-methyl-s-triazine-2,4(1H,3H)-dione	Velpar
HOE 00661	None	Ammonium(3-amino-3carboxypropyl)methyl phosphinate	None
HOE 0581	None	Not released	None
Linuron	Linu	3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea	Lorox
M 3785	None	2,4-D+3,6-dichloropicoliric acid	None
M 3972	None	3,6-dichloropicolinic acid	Lontrel
M 4505	None	Picloram	None
M 4506	None	Picloram	None
MBR 20457	None	Not released	None
MBR 18337	None	Not released	None
MBR 22359	None	Not released	None
MBR 23709	None	Not released	None
MC 10108	None	methyl 5- 2-chloro-4-(trifluoromethyl)-phenoxy -2-nitrobenzoate	None

Common Name or Code Name	Abbreviation [a]	Chemical Name	Trade Name
MCPA	None	(4-chloro-o-tolyl)oxy acetic acid	Numerous
MCPP	None	2 (4-chloro-o-tolyl)oxy propionic acid	Numerous
Mefluidide	Mefl	N- 2,4-dimethyl-S- (trifluoromethyl) sulfonyl amino phenyl acetamide	Embark,
Metham-sodium	Metham	sodium methyldithiocarbamate	Vistar
Metolachlor	Meto	2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl acetamide	Vapam
Metribuzin	Metr	4-amino-6-tert-butyl-3-(methylthio)-as-triazine-5(4H)one	Dual Sencor, Lexone
MK 143	None	Not released	None
MK 144	None	Not released	None
MK 145	None	Not released	None
MK 146	None	Not released	None
MK 147	None	Not released	None
MO-70434	None	Not released	None
MSMA	None	monosodium methanearsonate	Bueno-6
Napropamide	None	2-(α-naphthoxy)-N,N-diethylpropionamide	Devrinol
Naptalam	Napt	N-1-napthylphtalamic acid	Alanap
NC 20484	None	2,3dihydro-3,3dimethyl-5-benzofuranyl-ethanesulfonate	None
NC 21349	None	Not released	None
Oryzalin	Oryz	3,5-dinitro-N^4,N^4-dipropylsulfanilamide	Surflan
Paraquat	Para	1,1'-dimethyl-4,4'-bipyridinium ion	Paraquat
Pendimethalin	Pend	N-(1-ethylpropyl)-2,6-dinitro-3,4-xylidine	Prowl
Phenmedipham	Phen	methyl m-hydroxycarbanilate m-methyl carbanilate	Betanal
Picloram	Picl	4-amino-3,5,6-trichloropicolinic acid	Tordon
PPG 124	None	p-chlorophenyl N-methylcarbamate	None
PPG 884	None	Not released	None
PPG 1294	None	Not released	None
PPG 1295	None	Not released	None
PP 009	None	butyl 2- 4-((5-trifluoromethyl-2-pyridyl) oxy)phenoxy propanoate	Fusilade
Pronamid	None	3,5-dichloro (N-1,1-dimethyl-2-propynyl) benzamide	Kerb
Prometryn	Prom	2,4-bis(isopropylamino)-6-(methylthio)-s-triazine	Caparol
Propachlor	Prcl	2-chloro-N-isopropylacetanilide	Bexton,
Propanil	Prnl	3,4-dichloropropionanilide	Ramrod
Propham	Prph	isopropyl carbanilate	Stam,Stampede
Pyrazon	Pyra	5-amino-4-chloro-2-phenyl-3(2H)-pyridazinone	Chem Hoe-143
R-25788	None	N,N-diallyll-2,2-dichloroacetamide	Pyramin
R-33865	Ext	Not released	None
R-40244	None	1-(m-trifluoromethylphenyl)-3-chlor-4-chloromethyl-2-pyrrolidine	None
RH-8817	None	Not released	None
SC-0224	None	Not released	None
SC-1058	None	Not released	None
SD 45328	None	alanine,N-benzoyl-N-(3-chloro-4-fluorophenyl-1-ethyl ester	None
			Wildex

Common Name or Code Name	Abbreviation	Chemical Name	Trade Name
SD-95451	None	Not released	None
SD-96638	None	Not released	None
SN-55048	None	Not released	None
SN-83209	None	Not released	None
SSH 0860	None	1-amino-3-(2,2-dimethylpropyl-6-(ethylthio) 1,3,5-triazine-2,4C1H,3H-dione)	None
TCA	None	trichloroacetic acid	None
Tebuthiuron	None	N- 5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2-yl -N,N'-dimethylurea	Graslan
Terbutryn	Terb	2(tert-butylamino)-4-(ethylamino)-6-(methylthio)-s-triazine	Igran
Triallate	Tria	S-(2,3,3-trichloroallyl)diisopropylthiocarbamate	Far-go
Trifluralin	Trif	α,α,α-trifluoro-2,6-dinitro-N-N-dipropyl-p-toluidine	Treflan
2,4-D	None	(2,4-dichlorophenoxy)acetic acid	Numerous
UBI S-734	None	2- 1-(2,5-dimethylphenyl)ethylsufonyl pyridine N-oxide	None
Vernolate	Vern	S-propyl dipropythiocarbamate	Vernam

[a] Abbreviations in the tables may consist of only the first one, two or three listed letters when space was limited. Abbreviations of numbered compounds varies with available space, but usually was the first letters and numbers.

Multispecies evaluation of postemergence herbicides, Casselton, ND, 1982. Crops and weeds were planted May 28. Herbicides were applied in 17 gpa at 40 psi June 22 when Era wheat and Park barley had 3.5 leaves, Marmath oats had 3 leaves, Culbert flax was 3 inches tall, Evans soybeans were first trifoliolate, Fleetwood navy beans were first to early second trifoliolate, Hybrid 894 sunflowers had 4 leaves, Bush monofort sugarbeets had 2 to 4 leaves, Funks G4171 corn was 6 inches tall, redroot pigweed was 1.5 inches tall, wild mustard had 2 to 4 leaves, kochia was 1 to 3 inches in diameter, green and yellow foxtail was 1 to 2 inches tall, and common lambsquarters was 1 to 2 inches tall. The air temperature was 70F and the relative humidity was 52% during application. Weed control and crop injury was evaluated July 16.

Treatment	Rate (lb/A)	Percent Control												
		Wht	Bar	Oats	Flax	Dryb	Soyb	Sunfl	Sugbt	Corn	Rrpw	Fxtl	Wimu	Colq
Acifluorfen	.37	2	0	0	100	9	0	46	17	13	94	2	99	45
Bentazon	1	2	0	0	5	7	0	82	97	2	83	0	100	58
MK-144	.0625	0	0	0	0	15	3	0	10	6	23	19	34	7
MK-144	.125	0	0	0	8	15	6	0	15	3	48	15	46	14
MK-144	.25	0	0	0	27	37	9	2	50	0	73	15	81	25
MK-145	.0625	0	0	0	0	0	0	0	0	3	0	3	5	0
MK-145	.125	0	0	0	25	14	8	5	22	2	21	5	55	22
MK-145	.25	3	0	0	26	22	9	3	18	2	44	20	54	33
MBR 23709	1	38	29	30	2	13	24	53	50	3	55	77	85	26
MBR 23709	1.5	66	58	56	2	19	37	52	58	17	45	89	93	18
MO 70434	1	2	2	1	33	51	32	67	93	0	97	14	100	90
MO 70434	2	7	5	4	53	70	69	99	100	0	99	33	100	98
NAPT + DNBP (Dyanap)	1.5	0	0	0	2	33	0	75	75	16	55	0	88	32
NAPT + DNBP (Dyanap)	3	0	0	0	5	52	5	78	81	15	80	0	94	42
Mean		8	7	6	21	25	14	40	49	6	58	21	74	36
High Mean		66	58	56	100	70	69	99	100	17	99	89	100	98
Low Mean		0	0	0	0	0	0	0	0	0	0	0	5	0
Coeff. of Variation		44	39	40	45	68	62	22	22	84	32	54	10	35
LSD (1 percent)		8	6	6	21	39	20	20	24	11	56	26	17	29
LSD (5 percent)		6	4	4	16	29	15	15	18	8	40	19	13	21
No. of Reps.		3	3	3	3	3	3	3	3	3	2	3	3	3

Multispecies evaluation of preplant incorporated herbicides, Casselton, ND, 1982. Herbicides were applied and incorporated twice with a field cultivator plus harrow May 28. Era wheat, Park barley, Marmath oats, Culbert flax, Fleetwood navy beans, Evans soybeans, Hybrid 894 sunflowers, Bush monofort sugarbeets, Funks G4171 corn, redroot pigweed, and wild mustard were seeded May 28. Kochia, green and yellow foxtail, and common lambsquarters were natural infestations. Weed control and crop injury were evaluated June 21 to 25.

Treatment	Rate (lb/A)	Percent Control													
		Wht	Bar	Oats	Flax	Dryb	Soyb	Sunfl	Sugbt	Corn	Kochia	Fxtl	Rrpw	Wimu	Colq
Trifluralin	1	68	27	96	37	2	2	0	97	86	97	99	99	2	100
SD 95481	.5	40	43	55	21	14	5	18	33	81	71	94	83	57	93
SD 95481	1	77	93	96	42	30	8	16	64	90	98	98	92	78	97
SD 96638	.5	80	80	90	43	22	5	14	40	95	95	96	94	50	96
SD 96638	1	94	97	99	68	47	14	10	71	99	96	99	99	81	97
MO 70434	1	52	33	78	62	52	39	42	91	19	98	85	99	97	98
MO 70434	2	85	78	99	90	84	81	76	100	58	100	94	100	100	100
R-40244	.5	9	7	22	2	27	22	12	50	7	98	5	99	97	87
Bromoxynil	.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MO 70434	.5	22	10	35	35	15	17	16	45	8	95	67	96	92	93
Mean		53	47	67	40	29	19	20	59	54	85	74	86	65	86
High Mean		94	97	99	90	84	81	76	100	99	100	99	100	100	100
Low Mean		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Coeff. of variation		14	17	13	23	60	24	47	20	13	12	5	7	14	6
LSD (1 percent)		17	19	21	22	41	11	23	28	17	24	9	13	21	11
LSD (5 percent)		12	14	15	16	30	8	17	20	13	17	7	10	15	8
No. of Reps.		3	3	3	3	3	3	3	3	3	3	3	3	3	3

Multispecies evaluation of preemergence herbicides, Casselton, ND, 1982. Era wheat, Park barley, Marmath oats, Culbert flax, Fleetwood navy beans, Evans soybeans, Hybrid 894 sunflowers, Bush monofort sugarbeets, Funks G4171 corn, redroot pigweed, and wild mustard were planted and the herbicides were applied May 28. Kochia, green and yellow foxtail, and common lambsquarters were natural infestations. Weed control and crop injury were evaluated June 21 to 25.

Treatment	Rate (lb/A)	Percent Control													
		Wht	Bar	Oats	Flax	Dryb	Soyb	Sunfl	Sugbt	Corn	Kochia	Fxtl	Rrpw	Wimu	Colq
Chloramben	3	0	3	23	40	18	10	10	72	19	99	98	99	86	99
MK-143	.5	0	0	0	20	14	12	9	75	8	93	36	93	71	86
MK-143	1	0	0	0	62	21	23	13	82	6	96	61	96	90	97
MK-143	1.5	8	0	10	98	44	49	16	100	3	99	84	100	99	100
MO 70434	.5	8	2	20	36	12	7	13	57	3	80	62	80	96	70
MK-146	.5	2	0	8	91	43	40	16	100	8	98	90	99	99	99
MK-146	1	8	0	5	100	58	40	25	100	2	99	86	99	100	100
MK-147	.25	2	0	2	28	11	9	15	84	8	93	48	95	80	86
MK-147	.5	12	2	15	93	34	36	19	98	5	98	77	99	99	99
MK-147	1	15	5	20	97	49	53	38	100	17	99	88	99	100	100
MBR 22359	2	95	90	98	59	20	26	44	75	85	96	98	99	72	96
MBR 22359	3	95	90	96	68	33	37	54	69	83	96	98	99	85	99
MBR 23709	2	36	15	30	12	17	7	3	46	28	92	83	96	71	78
MBR 23709	3	70	40	55	27	13	14	24	70	29	98	95	98	93	99
MBR 20457	2	92	88	92	55	37	76	61	58	84	96	96	96	61	95
MBR 20457	3	93	90	96	57	41	78	48	58	68	99	97	99	66	99
SD 95481	1	1	1	0	30	12	10	5	43	27	90	75	63	55	77
SD 95481	2	0	0	20	59	13	7	14	58	58	83	83	75	66	81
SD 96638	1	0	0	33	72	11	13	12	55	67	73	80	78	50	61
SD 96638	2	13	8	60	89	26	36	19	73	84	88	92	77	63	69
MO 70434	1	8	3	8	32	9	10	3	70	0	85	59	87	96	70
MO 70434	2	57	30	72	78	48	55	44	100	4	99	80	99	99	90
Mean		28	21	35	59	27	29	23	75	32	93	80	92	82	89
High Mean		95	90	98	100	58	78	61	100	85	99	98	100	100	100
Low Mean		0	0	0	12	9	7	3	43	0	73	36	63	50	61
Coeff. of Variation		33	37	40	19	54	61	54	16	50	7	14	9	10	11
LSD (1 percent)		20	17	30	24	31	39	27	26	35	15	25	18	17	21
LSD (5 percent)		15	13	22	18	23	29	20	19	26	11	18	14	13	16
No. of Reps		3	3	3	3	3	3	3	3	3	3	3	3	3	3

Sugarbeet seed treatments, St. Thomas, N.D., 1982. Great Western R1 sugarbeet seed was treated with SC-1030 at 0.005 or 0.015% wt/wt. EPTC was applied to the center 4 rows of 6-row plots and incorporated by operating a rototiller 4 inches deep and the sugarbeets were planted in 22 inch rows May 12. Sugarbeet injury was evaluated June 15. Sugarbeets were counted July 8 in 60 feet of row in the four treated rows and in the two untreated rows between each treatment.

Treatment	Rate of Seed Treatment	Rate of Herbicide	June 15 Sgbt inj ratg	July 8 Sgbt Stand Reduc
			(%)	
EPTC SC-1030 (.015%)		3	30	32
EPTC SC-1030 (.015%)		5	65	43
EPTC SC-1030 (.005%)		3	28	20
EPTC SC-1030 (.005%)		5	55	44
EPTC		3	30	25
EPTC		5	68	43
No herbicide SC-1030 (.015%)			5	11
No herbicide SC-1030 (.005%)			0	9
Mean			35	28
High mean			68	44
Low mean			0	9
Coeff. of variation			22	46
LSD(1 Percent)			16	26
LSD(5 Percent)			12	19
No. of reps			4	4

Summary

All EPTC treatments caused significant sugarbeet injury and stand loss. The seed treatment did not protect the sugarbeets from EPTC injury.

Over-the-top weed control in sugarbeets, Glyndon, 1982. Great Western R1 sugarbeets were planted and TCA at 6 lb/A was surface applied April 28. Treatments were applied July 12, July 14, July 21, July 26, July 28, August 2 and August 9 when sugarbeets were 14, 17, 24, 24, 24, 26 and 28 inches tall, respectively and kochia was 36, 38, 54, 60, 60, 64 and 66 inches tall, respectively. The electrical discharge system was used July 21, July 28, August 2, and August 9. The recirculating sprayer and Bobar rope wick with acifluorfen were used July 12 and July 26. The weed puller was used July 14, July 26, and August 2. Acifluorfen was mixed 1 part herbicide to 30 parts water. Plots were cultivated June 8 and were harvested October 19.

Treatment	Time of Application	Sgbt inj (%)	Kocz cntl (%)	Sucrose (%)	Root Yield (ton/a)	Impurity Index	Extrac Sucros (lb/a)	Beet Popul #/60ft
EDS Time 1		0	17	13.8	4.3	1220	996	16
EDS Time 1&2		2	51	13.6	8.5	1303	1966	30
EDS Time 1&2&3		4	61	13.1	5.0	1401	1036	21
EDS Time 1&2&3&4		7	66	13.9	7.3	1273	1647	29
EDS Time 2		1	39	14.1	7.4	1218	1750	26
EDS Time 3		1	16	13.5	2.1	1339	455	12
EDS Time 4		6	30	13.5	6.8	1354	1487	29
EDS (Double Bar) Time 1&2		1	39	13.8	7.5	1285	1676	28
EDS (Double Bar)Time 1&2&3		3	64	13.6	9.6	1271	2116	33
EDS (Double Bar) Time 2		0	28	14.0	7.0	1264	1628	26
EDS (Double Bar) Time 3		2	30	14.1	7.7	1223	1828	27
EDS on weedfree bts Time 1		2	100	14.2	20.3	1249	4686	50
EDS on weedfree bts Time 2		6	100	13.7	18.8	1312	4136	48
EDS on weedfree bts Time 4		10	100	13.2	17.5	1391	3656	48
Hand weeded check		0	100	13.9	21.2	1287	4754	54
Weedy check		0	0	13.5	7.6	1348	1675	30
Weed puller Time 1		0	35	14.4	11.9	1147	2827	38
Weed puller Time 1&2		0	41	14.2	14.8	1161	3516	47
Weed puller Time 1&2&3		0	36	14.4	14.2	1161	3375	50
Weed puller Time 2		16	30	13.9	10.2	1275	2385	34
Weed puller Time 3		28	42	13.7	7.7	1311	1708	32

(Table continued on next page)

Table . Continued

Treatment	Time of Application	Sgbt inj (%)	Kocz cntl (%)	Sucrose (%)	Root Yield (ton/a)	Impurity Index	Extrac Sucros (lb/a)	Beet Popul #/60ft
RCS 1X	Time 1	1	19	13.1	8.1	1413	1802	30
RCS 2X	Time 1	4	45	14.6	9.6	1137	2393	38
RCS 1X	Time 2	3	43	14.4	8.3	1140	2055	32
RCS 2X	Time 2	4	56	14.1	8.8	1190	2091	35
RCS 1X	Time 1&2	4	41	13.9	10.1	1232	2349	37
RCS 2X	Time 1&2	5	50	13.7	11.7	1323	2564	43
Bobar 1X	Time 1	1	19	13.7	7.8	1263	1750	32
Bobar 2X	Time 1	0	33	14.5	7.5	1075	1875	30
Bobar 1X	Time 2	1	7	13.9	7.6	1227	1832	33
Bobar 2X	Time 2	2	17	13.7	3.7	1335	854	16
Bobar 1X	Time 1&2	2	23	14.1	8.8	1157	2067	35
Bobar 2X	Time 1&2	2	35	14.3	9.6	1172	2260	37
Mean		3	43	13.9	9.7	1256	2218	33
High mean		28	100	14.6	21.2	1413	4754	54
Low mean		0	0	13.1	2.1	1075	455	12
Coeff. of variation		198	34	4.3	40.8	10	43	36
LSD(1 Percent)		13	27	1.1	7.3	228	1758	22
LSD(5 Percent)		10	21	0.8	5.5	173	1330	17
No. of reps		4	4	4.0	4.0	4	4	4

Summary

Sugarbeets from the hand weeded check yielded significantly more than all treatments except the electrical discharge system on hand weeded beets and two treatments with the weed puller. The weed puller used twice or three times were the only non-hand weeded plots to yield more than the weedy check. Only the hand weeded treatments, the double bar electrical discharge system used three times and the single bar electrical discharge system used three or four times gave 60% or greater control of kochia.

Number of cultivations and herbicide treatment on sugarbeet yield, Fargo, 1982.

Preplant incorporated herbicides were applied and rototiller incorporated four inches deep and Bush Monofort sugarbeets were planted May 5. Desmedipham was applied June 11 when sugarbeets had 4 to 6 leaves, desmedipham + BAS 9052 was applied June 17 when sugarbeets had 6 to 8 leaves, and desmedipham + ethofumesate was applied June 25 when sugarbeets had 10 to 12 leaves. The single cultivation was June 22, two cultivations were June 15 and 22, three cultivations were June 15, June 22, and July 1, and four cultivations were June 4, June 22, July 1 and July 15. Sugarbeets were harvested September 23.

Table 1. Cultivation number and herbicide treatment effect on extractable sucrose/A.

Herbicide (When Applied)	Rate lb/A	Sugarbeet Extractable Sucrose					
		Number of Cultivations					Herb.
		0	1	2	3	4	Mean
		(lb/A)					
Hand weeded check		4801	4929	5327	5660	5271	5198
Cultivation alone		3005	3865	3926	4240	3458	3735
Ethofumesate + cycloate (PPI) 3+4		4319	4650	4732	4856	4414	4581
EPTC (PPI) 3, desmedipham (June 11) 1		4233	4472	4981	4770	4578	4607
Desmedipham (June 11) 0.75, desmedipham + BAS 9052 + OC (June 17) 0.75+0.2+1 qt, desmedipham + ethofumesate (June 25) 0.75+1.5		4007	4456	4866	5076	4455	4550
Cultivation Mean		4129	4476	4766	4916	4435	4542

LSD (0.05) Cultivation and Herbicide Means = 216
Cult x Herb = 579

Table 2. Cultivation number and herbicide treatment effect on sugarbeet root yield.

Herbicide (When Applied)	Rate lb/A	Sugarbeet Root Yield					
		Number of Cultivations					Herb.
		0	1	2	3	4	Mean
		(T/A)					
Hand weeded check		21.3	21.1	22.2	22.4	21.0	21.6
Cultivation alone		12.9	16.5	16.7	16.4	14.1	15.3
Ethofumesate + cycloate (PPI) 3+4		18.6	19.3	20.7	20.1	19.0	19.6
EPTC (PPI) 3, desmedipham (June 11) 1		18.3	19.0	20.4	19.7	18.8	19.2
Desmedipham (June 11) 0.75, desmedipham + BAS 9052 + OC (June 17) 0.75+0.2+1 qt, desmedipham + ethofumesate (June 25) 0.75+1.5		17.5	17.6	20.4	19.8	19.1	18.9
Cultivation Mean		17.7	18.7	20.1	19.7	18.4	18.9

LSD (0.05) Cultivation and Herbicide Means = 0.9
Cult x Herb = 2.0

Table 3. Cultivation number and herbicide treatment effect on sucrose content.

Herbicide	(When Applied)	Rate lb/A	Percent Sucrose					
			Number of Cultivations					Herb Mean
			0	1	2	3	4	
			(%)					
Hand weeded check			14.6	14.6	14.8	15.3	15.1	14.9
Cultivation alone			14.4	14.8	14.7	15.5	15.2	14.9
Ethofumesate + cycloate (PPI)		3+4	14.5	15.0	14.4	14.9	14.3	14.6
EPTC (PPI) 3, desmedipham (June 11)		1	14.5	15.0	15.8	15.0	14.8	15.0
Desmedipham (June 11) 0.75, desmedipham + BAS 9052 + OC (June 17) 0.75+0.2+1 qt, desmedipham + ethofumesate (June 25)		0.75+1.5	14.6	14.9	14.8	15.8	14.7	14.9
Cultivation Mean			14.5	14.9	14.9	15.3	14.8	14.9

LSD (0.05) Cultivation and Herbicide Means = 0.4
Cult x Herb = 0.9

Increased numbers of cultivations up to three increased or tended to increase sugarbeet yields. However, the fourth cultivation reduced sugarbeet yield. The sugarbeet canopy was nearly closed on July 15 when the fourth cultivation was done. This late cultivation may have caused excessive sugarbeet injury.

EPTC and cycloate plus insceticides, St. Thomas 1982. Herbicides and tank mixed herbicides plus liquid formulation insecticides were applied and incorporated by a rototiller set 4 inches deep and ACH 30 sugarbeets were planted May 13. Weed control and sugarbeet injury were evaluated June 15. Plots were cultivated and hand weeded between June 30 and July 3. Sugarbeets were harvested September 20.

Treatment	Rate (lb/a)	Sgbt inj ratg (%)	Wioa cntl ratg (%)	Sucrose (%)	Root Yield (ton/A)	Impurity Index	Extract Sucrose (lb/A)	Sgbt Popul Plts/ 80ft.	Sgbt Damage Scale 0-5
EPTC+Dyfonate	2.5+2	28	99	13.4	14.7	1245	3214	73	2.6
EPTC+Dyfonate	2.5+4	24	100	13.7	16.2	1205	3642	82	2.5
Cycloate+Dyfonate	4+2	6	94	13.9	16.6	1137	3839	97	2.3
Cycloate+Dyfonate	4+4	5	89	14.0	17.7	1135	4131	89	2.6
EPTC+Lorsban	2.5+2	20	97	13.9	15.0	1077	3517	77	2.9
Cycloate+Lorsban	4+2	6	91	13.8	15.3	1153	3485	85	2.8
EPTC	2.5	25	99	13.6	15.3	1244	3395	86	2.9
Cycloate	4	5	89	13.2	17.2	1231	3689	82	3.1
Mean		15	95	13.7	16.0	1178	3614	84	2.7
High mean		28	100	14.0	17.7	1245	4131	97	3.1
Low mean		5	89	13.2	14.7	1077	3214	73	2.3
Coeff. of variation		25	3	4.8	6.9	9	10	16	21.4
LSD(1 Percent)		7	5	1.3	2.2	212	719	26	1.4
LSD(5 Percent)		5	4	1.0	1.6	156	528	19	1.0
No. of reps		4	4	4.0	4.0	4	4	4	3.0

Summary

EPTC caused greater sugarbeet injury ratings than cycloate. Sugarbeets treated with EPTC+dyfonate or EPTC yielded less or tended to yield less extractable sucrose/A than sugarbeets treated with cycloate + dyfonate or cycloate. Sugarbeets yielded similarly when treated with EPTC+Lorsban or cycloate+Lorsban. EPTC gave wild oat control superior to cycloate.

Fall and spring incorporated herbicides, Crookston, MN., 1982. Fall herbicides were applied to the center four rows of 6-row plots October 30 with a rototiller operated 4 inches deep. Soil surface was moist at application. Spring herbicides were applied and incorporated with a rototiller operated 4 inches deep and Hilleshog 309 sugarbeets were planted in 22 inch rows May 7. Sugarbeet injury and green foxtail control were evaluated June 15 and July 26. Prostrate pigweed control was evaluated June 15 and sugarbeets were counted July 12 in 60 feet of row in the four treated rows and in the two untreated rows between each treatment.

Treatment	Time of Application	Rate (lb/a)	June 15 Sgbt inj ratg	June 15 Prpw cntl ratg	June 15 Grft cntl ratg	July 26 Sgbt inj ratg	July 26 Grft cntl ratg	July 12 Sgbt stand reduc
			(%)					
Cycloate	Fall	4	0	20	73	0	93	5
Cycloate+R-33865	Fall	4	0	18	91	0	98	0
Cycloate	Fall	6	1	59	96	4	93	2
Cycloate+R-33865	Fall	6	3	74	96	0	90	4
EPTC	Fall	4	0	18	53	0	65	15
EPTC+R-33865	Fall	4	0	38	88	0	70	6
Cycloate	Spring	3	1	81	93	0	73	9
Cycloate	Spring	4	4	92	100	5	95	19
EPTC	Spring	2	14	89	100	0	100	18
EPTC	Spring	3	24	93	100	0	93	24
Cycloate+R-33865	Spring	3	0	81	99	0	96	6
EPTC+R-33865	Spring	2	18	81	100	5	96	13
Mean			5	62	91	1	88	10
High mean			24	93	100	5	100	24
Low mean			0	18	53	0	65	0
Coeff. of variation			95	24	12	415	17	114
LSD(1 Percent)			10	29	21	9	29	22
LSD(5 Percent)			7	21	16	7	22	16
No. of reps			4	4	4	4	4	4

Summary

Only spring applied EPTC caused significant sugarbeet injury. Significant sugarbeet stand loss was caused by EPTC spring applied at 2 and 3 lb/A and by cycloate spring applied at 4 lb/A. Green foxtail control on June 15 was better with fall applied cycloate at 4 lb/A plus R-33865 and fall applied EPTC at 4 lb/A + R-33865 than with the same herbicides without R-33865. Green foxtail control on July 26 was better with fall cycloate than with fall EPTC.

Preplant incorporated herbicides, Galchutt, N.D., 1982. Herbicides were applied to the center four rows of 6-row plots and rototiller incorporated and Hilleshog 309 sugarbeets were planted in 22 inch rows on April 26. The rototiller was operated 4 inches deep for treatments containing EPTC and cycloate and 2 inches deep for the others. Sugarbeet injury and weed control were evaluated June 14 and June 24. Sugarbeets were counted in 60 feet of row and weeds were counted in 40 square feet of the treated area and the adjacent untreated areas on June 28. Injury ratings on June 24 and stand reductions were averaged to form the combined data columns.

Table 1.

Treatment	Rate lb/a	June 14 Sgbt inj ratg	June 24 Sgbt inj ratg	June 28 Sgbt stand reduc	Sgbt inj comb	June 14 Rrpw cntl ratg	June 24 Rrpw cntl ratg	June 28 Rrpw stand reduc	Rrpw cntl comb
		(%)							
EPTC	2	0	0	5	3	50	48	6	27
Cycloate	4	0	3	-21	-10	48	38	-39	-1
EPTC+Cycloate	2+2	11	0	1	0	88	68	33	50
EPTC+Cycloate	1.5+2.5	0	3	-2	0	81	76	26	51
Ethofumesate	3.75	0	0	-3	-1	95	95	77	86
Diethatyl	6	4	0	1	0	97	91	76	84
Ethofumesate+Cycloate	3+3	10	5	1	3	97	95	89	93
Diethatyl+Cycloate	4+3	5	0	-12	-6	94	91	68	80
Diethatyl+Pyrazon-L	4+6	5	0	-7	-4	86	86	62	74
Diethatyl+Pyra-L+TCA	4+6+4	3	0	-19	-10	90	83	48	66
Diethatyl+EPTC	3+1.5	10	0	-5	-3	91	88	57	73
Ethofumesate+Pyrazon-L	3+6	3	4	-7	-2	90	88	65	77
Ethofume+Pyra-L+Cyclo	3+6+3	16	9	-12	-2	97	96	86	91
EPTC&R-33865	2	6	4	2	3	60	45	10	28
Cycloate&R-33865	4	1	0	-7	-4	60	38	21	30
Diethatyl+S-734-F	6+1.5	13	10	-1	4	93	89	79	84
Ethofume+S-734-F	3.75+1.5	9	0	-8	-4	96	91	74	83
Diethatyl+TCA	6+6	3	3	-14	-6	86	78	47	62
Ethofumesate+TCA	3.75+6	4	0	-8	-4	95	93	76	85
Mean		5	2	-6	-2	84	78	50	64
High mean		16	10	5	4	97	96	89	93
Low mean		0	0	-21	-10	48	38	-39	-1
Coeff. of variation		87	224	-224	-382	7	16	44	21
LSD(1 Percent)		9	9	26	15	11	23	42	25
LSD(5 Percent)		7	6	19	11	8	17	31	19
No. of reps		4	4	4	4	4	4	4	4

(Experiment continued on next page)

Preplant incorporated herbicides, Galchutt, N.D., 1982. (continued)
Table 2.

Treatment	Rate lb/a	June 14 Colq cntl ratg	June 24 Colq cntl ratg	June 28 Colq stand reduc	Colq cntl comb	June 14 Wimu cntl ratg	June 24 Wimu cntl ratg	June 14 Grft Yeft cntl ratg	June 24 Grft Yeft cntl ratg
		(%)							
EPTC	2	70	54	25	39	18	28	96	97
Cycloate	4	78	64	50	57	35	24	94	87
EPTC+Cycloate	2+2	92	81	47	64	68	59	100	99
EPTC+Cycloate	1.5+2.5	90	80	41	61	53	55	99	99
Ethofumesate	3.75	82	79	52	66	83	76	85	66
Diethatyl	6	59	38	37	38	49	48	88	84
Ethofumesate+Cycloate	3+3	93	92	83	88	94	94	99	96
Diethatyl+Cycloate	4+3	91	81	49	65	64	69	96	96
Diethatyl+Pyrazon-L	4+6	93	93	80	86	94	89	91	88
Diethatyl+Pyra-L+TCA	4+6+4	89	94	69	81	91	90	89	81
Diethatyl+EPTC	3+1.5	81	70	41	56	60	70	100	99
Ethofumesate+Pyrazon-L	3+6	89	91	58	75	95	94	73	73
Ethofume+Pyra-L+Cyclo	3+6+3	98	97	84	91	99	98	97	96
EPTC&R-33865	2	70	69	22	45	43	44	100	97
Cycloate&R-33865	4	81	78	39	59	40	40	95	90
Diethatyl+S-734-F	6+1.5	78	70	28	49	59	63	99	100
Ethofume+S-734-F	3.75+1.5	86	81	50	66	76	79	99	100
Diethatyl+TCA	6+6	62	63	35	49	36	55	91	88
Ethofumesate+TCA	3.75+6	84	80	52	66	81	79	92	86
Mean		82	76	49	63	65	66	94	91
High mean		98	97	84	91	99	98	100	100
Low mean		59	38	22	38	18	24	73	66
Coeff. of variation		12	13	41	18	23	23	5	9
LSD(1 Percent)		18	18	38	21	29	28	8	16
LSD(5 Percent)		14	14	28	16	22	21	6	12
No. of reps		4	4	4	4	4	4	4	4

Summary

Six herbicide treatments gave sugarbeet injury on June 14 but the June 24 rating combined with sugarbeet stand reduction did not indicate significant sugarbeet injury by any treatment. EPTC+cycloate gave or tended to give superior weed control and less sugarbeet injury than EPTC alone. Ethofumesate and ethofumesate+pyrazon gave less than average control of foxtail. Treatments which included pyrazon and ethofumesate+cycloate gave over 90% wild mustard control and over 75% common lambsquarters control. Other treatments gave less than 80% control of wild mustard and less than 66% control of common lambsquarters. Only ethofumesate+cycloate and ethofumesate+pyrazon+cycloate gave over 90% combined control of redroot pigweed.

Preplant incorporated herbicides, St. Thomas, N.D., 1982. Herbicides were applied to the center 4 rows of 6-row plots and rototiller incorporated May 12. ACH 30 sugarbeets were planted in 22 inch rows on May 13. The rototiller was operated 4 inches deep for treatments including EPTC or cycloate and 2 inches deep for the others. Sugarbeet injury and wild oat contol were evaluated June 15 and June 30. Green and yellow foxtail control was evaluated June 15 and wild buckwheat on June 30. Sugarbeets were counted July 8 in 60 feet of row in the four treated rows and in the two untreated rows between each treatment.

Treatment	Rate (lb/a)	June 15 Sgbt inj ratg	June 15 Wioa cntl ratg	June 15 Grft Yeft cntl ratg	June 30 Sgbt inj ratg	June 30 Wioa cntl ratg	June 30 Wibw cntl ratg	July8 Sgbt stand reduc
		(%)						
EPTC+Diallate	2+1	19	98	99	3	93	0	17
Cycloate+Diallate	4+1	5	96	99	1	87	0	9
Diethatyl+Diallate	6+2	6	98	99	3	98	0	15
Ethofumesate+Diallate	3.75+2	13	100	97	3	96	60	10
Diethatyl+TCA	6+6	9	96	98	1	93	0	13
Ethofumesate+TCA	3.75+6	6	91	96	1	90	94	2
Diethatyl+Cycloate	4+3	21	94	99	16	89	0	28
Ethofumesate+Cycloate	3+3	18	93	100	6	96	54	14
EPTC+Cycloate	2+2	16	99	100	2	96	0	9
EPTC+Cycloate	1.5+2.5	11	95	100	3	91	25	-10
S-734-F	1.5	0	76	95	3	61	0	8
S-734-F	3	15	94	100	3	85	0	7
Diethatyl+EPTC	4+2	28	96	98	13	94	40	16
Diethatyl+S-734-F	6+1.5	18	97	100	7	94	0	14
Ethofumesate+S-734-F	3.75+1.5	28	100	100	13	98	63	32
Mean		14	95	99	5	91	22	12
High mean		28	100	100	16	98	94	32
Low mean		0	76	95	1	61	0	-10
Coeff. of variation		52	5	3	100	9	63	113
LSD(1 Percent)		14	9	5	10	15	42	26
LSD(5 Percent)		10	7	4	7	11	30	19
No. of reps		4	4	4	4	4	2	4

Summary

Diethatyl+cycloate, diethatyl+EPTC, and ethofumesate+S-734 gave more sugarbeet injury on June 30 than the other treatments. All treatments except S-734 at 1.5 lb/A gave good to excellent control of wild oat. Treatments which included ethofumesate gave or tended to give better wild buckwheat control than the other treatments.

Soil applied herbicides, Argyle, MN., 1982. Preplant incorporated herbicides were applied to the center 4 rows of 6-row plots and rototiller incorporated, ACH 30 sugarbeets were planted in 22 inch rows, and preemergence herbicides were applied May 8. The rototiller was operated 4 inches deep for treatments including EPTC and cycloate and two inches deep for the other PPI treatments. Sugarbeet injury and green foxtail control were evaluated July 26. Sugarbeets were counted July 30 in 60 feet of row in the four treated rows and in the two untreated rows between each treatment.

Treatment	Rate (lb/a)	July 26 Sgbt inj ratg	July 26 Grft cntl ratg	July 30 Sgbt stand reduc
			(%)	
S-734-F	1.5	0	100	-7
S-734-F	3	0	100	-6
TCA	6	0	72	-19
EPTC	2.5	0	97	-3
Cycloate	4	0	94	-18
Diethatyl	6	0	95	-3
Ethofumesate	3.75	0	95	-3
Diethatyl+TCA Preemerge	6+6	0	95	15
Diethatyl+TCA PPI	6+6	0	96	20
Ethofumesate+TCA Preemerge	3.75+6	0	100	-5
Ethofumesate+TCA PPI	3.75+6	0	94	-9
EPTC+Cycloate	2+2	0	99	-12
EPTC+Cycloate	1.5+2.5	0	99	-13
EPTC+Diallate	2.5+1	0	98	-6
EPTC+TCA	2.5+6	0	96	-16
EPTC+S-734-F	2.5+1.5	0	100	-11
Diethatyl+S-734-F	6+1.5	0	100	7
Ethofumesate+S-734-F	3.75+1.5	0	100	4
Cycloate+TCA	4+6	0	99	1
Cycloate+S-734-F	4+1.5	0	100	-7
Pyrazon-L+TCA	6+6	0	85	-8
Pyrazon-L+S-734-F	6+1.5	0	100	-10
Diethatyl+EPTC	4+2	0	99	6
Diethatyl+Cycloate	4+3	0	97	-5
Ethofumesate+Cycloate	3+3	0	100	-6
Diethatyl+Cycloate+Diallate	4+3+1	0	98	7
Diethatyl+Diallate	6+1	0	95	6
EPTC+R-33865	2.5	0	99	-16
Cycloate+R-33865	4	0	99	4
Mean		0	96	-4
High mean		0	100	20
Low mean		0	72	-19
Coeff. of variation		0	5	-371
LSD(1 Percent)		0	9	27
LSD(5 Percent)		0	7	20
No. of reps		4	4	4

Summary

None of the treatments caused visible injury to sugarbeets. Negative sugarbeet stand reduction indicates more sugarbeets in the treated than in the untreated area. Sugarbeet stand reduction from diethatyl+TCA tended to be greater than from the other treatments. All treatments except TCA and pyrazon+TCA gave 94% or greater green foxtail control.

Preplant incorporated herbicides, Clara City, MN, 1982. Herbicides were applied and rototiller incorporated and ACH 30 sugarbeets were planted in 22 inch rows on April 30. The rototiller was operated four inches deep for treatments including EPTC and cycloate and two inches deep for the others. Sugarbeet injury and green and yellow foxtail control were evaluated May 28 and June 21. Common lambsquarters and redroot pigweed control was evaluated June 21.

Treatment	Rate (lb/a)	--May 28-- Sgbt inj ratg	Grft Yeft cntl ratg	------ June 21 ------ Sgbt inj ratg	Colq cntl ratg	Rrpw cntl ratg	Grft Yeft cntl ratg
				(%)			
Diethatyl+Pyrazon-L	4+6	1	86	4	87	84	79
EPTC+S-734-F	2.5+1.5	1	96	3	66	51	100
EPTC	2.5	0	88	0	3	3	83
Cycloate	4	0	85	0	41	30	95
EPTC+R-33865	2.5	5	88	4	59	34	97
Cycloate+R-33865	4	0	85	0	78	35	98
Diethatyl+S-734-F	6+1.5	10	95	8	76	86	98
Ethofumesate+S-734-F	3.75+1.5	8	98	9	86	91	100
Diethatyl	6	1	85	5	30	86	82
Ethofumesate	3.75	0	84	1	89	93	84
Diethatyl+TCA	6+6	8	93	10	79	89	91
Ethofumesate+TCA	3.75+6	4	90	9	84	93	91
EPTC+Cycloate	2+2	0	95	0	81	41	96
EPTC+TCA	2.5+6	5	93	3	51	33	93
Diethatyl+Cycloate	4+3	8	98	8	91	95	97
Ethofumesate+Cycloate	3+3	0	93	1	95	98	99
Diethatyl+EPTC	4+2	6	98	5	81	91	93
Mean		3	91	4	69	67	93
High mean		10	98	10	95	98	100
Low mean		0	84	0	3	3	79
Coeff. of variation		138	5	110	20	18	5
LSD(1 Percent)		9	8	8	26	22	9
LSD(5 Percent)		6	6	6	20	17	7
No. of reps		4	4	4	4	4	4

Summary

EPTC+R-33865 gave better green and yellow foxtail control than EPTC alone on June 21. R-33865 did not affect weed control from cycloate. Addition of S-734 or TCA to EPTC, diethatyl, or ethofumesate gave improved control of green and yellow foxtail compared to EPTC, diethatyl, or ethofumesate alone. None of the treatments caused severe sugarbeet injury.

Preplant incorporated herbicides, Grand Forks, N.D, 1982. Herbicides were applied to the center 4 rows of 6-row plots and rototiller incorporated and ACH 30 sugarbeets were planted in 22 inch rows May 24. The rototiller was operated 4 inches deep for treatments including EPTC and cycloate and 2 inches deep for the others. Sugarbeet injury and control of green foxtail and quackgrass were evaluated July 16. Sugarbeets were counted August 11 in 60 feet of row in the four treated rows and in the two untreated rows between each treatment.

Treatment	Rate (lb/a)	July 16 Sgbt inj ratg	July 16 Grft cntl ratg	July 16 Qkgr cntl ratg	Aug.11 Sgbt stand reduc
				(%)	
EPTC	2.5	9	84	70	3
Cycloate	4	5	84	51	22
EPTC+Cycloate	2+2	24	96	81	20
Diethatyl+EPTC	4+2	25	95	85	15
Diethatyl+Cycloate	4+4	24	89	83	-7
Diethatyl+TCA	6+6	13	95	81	16
Ethofumesate+EPTC	3+2	25	99	88	29
Ethofumesate+Cycloate	3+4	20	97	90	10
TCA	12	15	81	74	17
Diethatyl+TCA	6+12	25	91	85	17
EPTC+R-33865	2.5	11	99	78	14
Cycloate+R-33865	4	11	88	73	0
Ethofumesate+TCA	3.75+6	11	94	91	6
Diethatyl+Pyrazon-L	6+6	5	81	45	1
Ethofumesate+Pyrazon-L	3.75+6	14	93	78	23
Diethatyl+Pyrazon-L+TCA	4+6+6	15	89	80	23
Ethofumesate+Pyrazon-L+TCA	3+6+6	11	91	76	1
Mean		15	91	77	12
High mean		25	99	91	29
Low mean		5	81	45	-7
Coeff. of variation		71	6	15	143
LSD(1 Percent)		21	11	21	33
LSD(5 Percent)		16	8	16	25
No. of reps		4	4	4	4

Summary

EPTC+cycloate, diethatyl+EPTC, diethatyl+cycloate, ethofumesate+cycloate, and diethatyl+TCA at 6+12 lb/A caused significant sugarbeet injury ratings. Sugarbeet stand reductions did not agree closely with injury ratings. All treatments except cycloate and diethatyl+pyrazon gave 70% or greater quackgrass control. EPTC+R-33865 gave green foxtail control superior to EPTC alone.

Soil applied and postemergence herbicides, Crookston, MN., 1982. Preplant incorporated herbicides were applied to the center 4 rows of 6-row plots and rototiller incorporated and Hilleshog 309 sugarbeets were planted in 22 inch rows May 7. The rototiller was operated 4 inches deep for treatments including EPTC and cycloate and 2 inches deep for the others. Single application postemergence herbicides and the first half of split applied postemergence herbicides were applied June 15 when sugarbeets had 4 to 8 leaves, redroot pigweed was 2 inches tall, and green foxtail was emerging to 4 inches tall. The second half of the split applications were applied June 21. Air temperature was 73 F and relative humidity 46% on June 15. Air temperature was 68 F and relative humidity was 58% on June 21. Sugarbeet injury was evaluated June 15 before the postemergence herbicides were applied and on July 26. Weed control was evaluated July 26. Sugarbeets were counted in 60 feet of row and redroot pigweed in 40 sq. ft. in the treated four rows and in the two untreated rows between each treatment.

			June 15	--- July 26 ---			-- July 13 --	
Treatment	Time of Application	Rate (lb/a)	Sgbt inj ratg	Sgbt inj ratg	Rrpw cntl ratg	Grft cntl ratg	Sgbt stand reduc	Rrpw stand reduc
			---(%)---					
EPTC	PPI	2.5	15	0	79	85	-5	56
Cycloate	PPI	4	15	0	85	94	14	51
EPTC+Diallate	PPI	2.5+2	28	0	65	100	12	52
Cycloate+Diallate	PPI	4+2	16	6	53	100	19	33
EPTC+TCA	PPI	2.5+6	15	0	85	100	5	59
Cycloate+TCA	PPI	4+6	13	0	63	100	1	51
Diethatyl+TCA	PPI	6+6	36	0	100	98	36	87
Ethofumesate+TCA	PPI	3.75+6	23	0	100	100	20	80
Diethatyl+EPTC	PPI	4+2	35	9	98	96	35	78
Diethatyl+Cycloate	PPI	4+3	33	5	96	98	35	80
Ethofumesate+Cycloate	PPI	3+3	23	8	100	98	-2	57
EPTC+Cycloate	PPI	2+2	29	3	68	100	6	60
Pyrazon-L+TCA	PPI	6+6	15	0	97	90	-11	77
Diethatyl	PPI	6	36	3	100	98	36	93
Ethofumesate	PPI	3.75	20	5	96	90	3	61

Table continued on next page.

Table . Continued

Treatment	Time of Application	Rate (lb/a)	June 15 Sgbt inj ratg	July 26 Sgbt inj ratg	July 26 Rrpw cntl ratg	July 26 Grft cntl ratg	July 13 Sgbt stand reduc	July 13 Rrpw stand reduc
					(%)			
Desmedipham	Post	1	0	0	96	33	-22	78
Desmedipham 2X Split	Post	.75	0	0	100	74	-23	97
Ethofume+Desmed	Post	1.5+0.75	0	0	100	75	-4	98
Etho+Desm 2X Split	Post	.75+.37	0	0	100	75	-8	98
Acifluorfen	Post	0.03	0	0	8	0	-10	20
Acifluorfen	Post	.06	0	0	5	0	-8	18
Acifluorfen	Post	0.125	0	0	6	1	0	34
Acifluorfen	Post	0.25	0	3	39	1	-1	55
Desmedipham+Acifluor	Post	1+0.03	0	0	78	33	-12	52
Desmedipham+Acifluor	Post	1+0.06	0	0	89	36	-17	19
Desmedipham+Acifluor	Post	1+0.125	0	0	95	8	-6	44
Desm+Acif 2X Split	Post	.5+.06	0	0	80	45	-5	56
Desm+Acif 2X Split	Post	.5+.03	0	0	93	49	10	26
EPTC/Desmedipham	PPI/Post	2.5/1	30	0	100	100	12	96
Diethatyl/Desmed	PPI/Post	6/1	25	3	99	100	27	98
Ethofume/Desmed	PPI/Post	3.75/1	20	6	100	100	14	97
Desmed+Endothall	Post	1+0.5	0	0	79	83	-24	52
Desm+Endo 2X Split	Post	.5+.25	0	0	98	95	-20	72
Mean			13	1	80	71	3	63
High mean			36	9	100	100	36	98
Low mean			0	0	5	0	-24	18
Coeff. of variation			55	372	18	20	556	34
LSD(1 Percent)			13	10	27	26	34	40
LSD(5 Percent)			10	8	21	20	25	30
No. of reps			4	4	4	4	4	4

Summary

Diethatyl+TCA, diethatyl+EPTC, diethatyl+cycloate, and diethatyl were the only treatments with greater than 30% injury rating June 15 and greater than 30% sugarbeet stand reduction. Desmedipham+acifluorfen gave or tended to give less redroot pigweed control than desmedipham alone. Preplant incorporated EPTC, diethatyl, or ethofumesate plus postemergence desmedipham gave nearly total weed control.

Postemergence herbicides on hand weeded sugarbeets, Fargo, 1982. Bush Monofort sugarbeets were planted and TCA at 6 lb/A was surface applied May 5. Sugarbeets were cultivated June 15 and hand weeded throughout the season. Postemergence herbicides were applied June 11, June 16, June 25, or August 2 when sugarbeets had 4 to 6, 6 to 8, 10 to 12 leaves, or a closed canopy, respectively. Sugarbeets were harvested September 28.

Treatment	Time of Application	Rate (lb/a)	Sucrose (%)	Root Yield (ton/a)	Impurity Index	Extract Sucrose (lb/a)	Beet Popul #/48ft
DOWCO 453+OC	(June 11)	.1+.25G	14.8	22.9	1489	5281	45
DOWCO 453+OC	(June 11)	.2+.25G	15.3	22.8	1415	5462	46
DOWCO 453+OC	(June 11)	.3+.25G	14.8	23.5	1541	5337	41
Diclofop	(June 11)	2	15.5	24.1	1329	5938	46
Diclofop	(June 11)	4	16.5	21.1	1469	5432	40
BAS 9052+OC	(June 11)	.25+.25G	15.3	23.2	1412	5600	41
BAS 9052+OC	(June 11)	.5+.25G	16.2	22.5	1293	5845	43
BAS 9052+OC	(June 11)	1+.25G	15.5	22.9	1435	5585	45
PP-009+OC	(June 11)	.25+.25G	15.2	22.5	1468	5346	45
PP-009+OC	(June 11 & Aug. 2)	.5+.25G	15.4	24.3	1312	6020	46
PP-009+OC	(June 11)	1+.25G	15.6	23.2	1383	5686	43
PP-009+OC	(June 11 & 25)	.5+.25G	15.4	22.6	1319	5606	44
PP-009+OC	(June 11)	2+.25G	14.8	24.0	1525	5464	44
Acifluorfen	(June 11)	.06	15.7	22.6	1321	5684	43
Acifluorfen	(June 11)	.12	16.5	22.4	1312	5915	45
Acifluorfen	(June 11)	.25	15.8	20.8	1263	5271	46
Acifluorfen	(June 11)	.5	16.2	19.5	1215	5045	44
Acifluorfen	(June 16)	.12	15.5	21.1	1352	5203	42
Acifluorfen	(June 16)	.25	15.6	20.9	1364	5155	43
Acifluorfen	(June 16)	.5	15.4	18.7	1358	4541	42
Acifluorfen	(June 25)	.12	16.0	22.1	1305	5692	44
Acifluorfen	(June 25)	.25	14.9	21.2	1503	4876	41
Acifluorfen	(June 25)	.5	15.3	21.3	1609	4945	44
Untreated check			15.5	24.1	1344	5960	43
Mean			15.5	22.3	1389	5454	44
High mean			16.5	24.3	1609	6020	46
Low mean			14.8	18.7	1215	4541	40
Coeff. of variation			5.8	9.0	13	11	10
LSD(1 Percent)			1.4	3.0	274	906	7
LSD(5 Percent)			1.0	2.3	207	685	5
No. of reps			6.0	6.0	6	6	6

Summary

All acifluorfen treatments except 0.06 and 0.12 lb/A on 4 to 6 leaf sugarbeets and 0.12 lb/A on 10 to 12 leaf sugarbeets caused a reduction in extractable sucrose per acre compared to the hand weeded check. None of the other treatments caused a significant yield loss.

Oil additive with postemergence grass and broadleaf herbicides, Glyndon, MN., 1982. Great Western R1 sugarbeets were seeded 1.25 inches deep in 22 inch rows on April 28. Herbicides were applied to the center four rows of six row plots in 17 gpa of water on May 25 when sugarbeets had 2 leaves, redroot pigweed was emerging to 1 inch tall and kochia was 0.5 to 2 inches tall. Weed control and sugarbeet injury were evaluated June 14. Sugarbeets were counted in 60 feet of row and weeds were counted in 40 sq. ft. in the treated area and in the adjacent untreated area. The oil-herbicide interaction was not significant so the herbicide treatment means are presented in table 2 and the oil additive means are presented in table 3. The combined values are an average of the injury rating and the stand reduction.

Table 1.

Treatment	Rate (lb/a)	6-14 Sgbt %ir	6-8 Sgbt %sr	Sgbt inj comb (%)	6-14 Rrpw cntl ratg (%)	6-21 Rrpw %sr	Rrpw cntl comb (%)	6-14 KOCZ cntl ratg (%)	6-21 KOCZ %sr	KOCZ cntl comb (%)
Desmedipham	1	17	11	14	90	89	90	73	41	58
Desmedipham+OC	1+.25G	28	34	32	97	87	92	88	52	70
Desmedipham&Phenmedipham	1	13	20	17	85	89	87	90	58	74
Desmedipham&Phenmed+OC	1+.25G	22	-2	10	85	86	86	85	63	74
Ethofume+Desmedipham	1.5+.75	35	4	20	100	97	99	96	62	79
Ethofume+Desm+OC	1.5+.75+.25G	25	-6	10	100	97	99	97	55	77
Ethofumesate+Des&Phen	1.5+.75	33	13	24	100	96	98	99	73	87
Etho+Des&Phen+OC	1.5+.75+.25G	43	24	34	99	93	96	97	67	82
Desmedipham+BAS 9052	1+.2	15	14	15	92	87	90	83	65	74
Desmed+BAS 9052+OC	1+.2+.25G	30	9	20	97	83	90	87	75	81
Desmedipham+PP-009	1+.25	10	-28	-9	92	87	90	93	45	70
Desmed+PP-009+OC	1+.25+.25G	23	19	21	93	88	91	93	57	75
Desmedipham+Dalapon	1+2	30	24	27	90	92	91	88	62	76
Desmedipham+Dalapon+OC	1+2+.25G	45	46	46	97	89	93	95	87	92
Desmedipham+Endothall	1+.5	8	-1	4	88	86	87	83	36	60
Desmed+Endothall+OC	1+.5+.25G	23	4	14	88	78	83	83	64	74
Des&Phen+Endothall	1+.5	10	12	11	81	82	82	91	41	66
Des&Phen+Endothall+OC	1+.5+.25G	22	6	14	85	77	81	92	67	79
Des&Phen+Dalapon	1+2	45	42	44	93	82	87	94	84	89
Des&Phen+Dalapon+OC	1+2+.25G	43	30	37	90	88	89	94	82	88
Des&Phen+BAS 9052	1+.2	8	11	10	88	92	90	91	66	79
Des&Phen+BAS 9052+OC	1+.2+.25G	23	19	22	87	91	89	85	58	72
Des&Phen+PP-009	1+.25	13	10	12	83	88	86	92	71	82
Des&Phen+PP-009+OC	1+.25+.25G	27	21	24	83	78	81	90	76	84
Etho+Desm+BAS 9052	1.5+.75+.2	28	20	25	100	98	99	97	67	82
Eth+Des+BAS+OC	1.5+.75+.2+.25G	37	20	28	100	97	99	96	54	75
Mean		25	14	20	92	88	90	91	63	77
High mean		45	46	46	100	98	99	99	87	92
Low mean		8	-28	-9	81	77	81	73	36	58
Coeff. of variation		30	100	45	4	5	4	6	22	11
LSD(1 Percent)		16	31	20	9	10	7	12	30	18
LSD(5 Percent)		12	24	15	7	8	5	9	22	14
No. of reps		3	3	3	3	3	3	3	3	3

(experiment continued on next page)

Table 2. Sugarbeet injury and weed control averaged over oil additive and no oil additive at Glyndon, MN. in 1982.

Herbicide	Rate (lb/A)	Sgbt inj ratg (%)	Sgbt stand reduc (%)	Sgbt inj comb (%)	KOCZ cntl ratg (%)	KOCZ stand reduc (%)	KOCZ cntl comb (%)	Rrpw cntl ratg (%)	Rrpw stand reduc (%)	Rrpw cntl comb (%)
Desmedipham	1	22	22	22	81	46	64	93	88	91
Desm+phenmedipham	0.5+0.5	18	9	14	88	60	74	85	88	87
Ethofumesate+desm	1.5+0.75	30	-1	15	97	59	78	100	97	99
Etho+desm+phen	1.5+0.38+0.38	38	19	29	98	70	84	99	95	97
Desm+BAS 9052	1+0.2	22	12	17	85	70	78	94	85	90
Desm+PP-009	1+0.25	16	-4	6	93	51	72	92	87	90
Desm+dalapon	1+2	38	34	36	92	75	84	93	90	92
Desm+endothall	1+0.5	16	1	9	83	50	67	88	82	85
Desm+phen+endo	0.5+0.5+0.5	15	2	9	93	59	76	82	78	80
Desm+phen+dalapon	0.5+0.5+2	44	36	40	94	83	89	91	85	88
Desm+phen+BAS 9052	0.5+0.5+0.2	16	15	16	88	62	75	87	92	90
Desm+phen+PP-009	0.5+0.5+0.25	20	15	18	91	74	83	83	83	83
Etho+desm+BAS	1.5+0.75+0.2	32	20	26	96	61	79	100	98	99
LSD (5%)		9	17	11	6	16	10	5	6	4

Table 3. Sugarbeet injury and weed control averaged over herbicide treatments at Glyndon, MN. in 1982.

Additive	Sgbt inj ratg (%)	Sgbt stand reduc (%)	KOCZ cntl ratg (%)	KOCZ stand reduc (%)	Rrpw cntl ratg (%)	Rrpw stand reduc (%)
None	20	11	90	60	91	89
Oil concentrate* at 1 qt/A	30	17	91	66	92	87
LSD (5%)	5	10	4	10	3	3

*At Plus 411F

Summmary

Treatments that included dalapon or ethofumesate gave or tended to give greater sugarbeet injury than other treatments. Kochia control ratings were greater than kochia stand reductions indicating that many treated kochia plants recovered from herbicide injury. Desmedipham alone gave less kochia control than any other treatment except desmedipham+endothall. Only ethofumesate+desmedipham+phenmedipham, desmedipham+dalapon+oil concentrate, and desmedipham+phenmedipham+dalapon+oil concentrate or without oil concentrate gave 85% or greater combined control of kochia. Sugarbeet injury was generally increased by the oil additive. Weed control was increased by the oil additive in a few instances but when averaged over all herbicide treatments, the oil additive did not significantly increase weed control. This contradicts the results at St. Thomas, N.D. where weed control was improved by the oil additive.

Postemergence herbicides, Argyle, MN., 1982. ACH 30 sugarbeets were planted 1.25 inches deep in 22 inch rows May 8. Herbicides were applied in 17 gpa of water at 40 psi to the center four rows of six row plots on June 21 when sugarbeets had 8 to 10 leaves, and green foxtail was 1.5 to 8 inches tall. Weed control and sugarbeet injury were evaluated July 26 and sugarbeets were counted July 30 in 60 feet of row in the treated area and in the adjacent untreated areas.

Treatment	Rate (lb/a)	-- July 26 -- Sgbt inj ratg	Grft cntl ratg	July30 Sgbt stand reduc
			(%)	
Desmedipham	1	0	43	-9
Desmedipham+Dalapon	1+2	0	99	-5
Desmedipham+Endothall	1+.5	0	70	-12
Ethofumesate+Desmedipham	1.5+.75	0	66	-9
Desmedipham+BAS 9052+OC	1+.2+.25G	0	100	-16
Desmedipham+PP-009+OC	1+.25+.25G	0	86	-14
Ethofumesate+Desm+BAS 9052	1.5+.75+.2	0	98	-24
Ethofumesate+Desm+PP-009	1.5+.75+.25	0	73	-10
Desm+Endo+BAS 9052+OC	1+.5+.2+.25G	0	97	-6
Desm+Endo+PP-009+OC	1+.5+.25+.25G	0	87	-22
Desmedipham+Acifluorfen	1+.06	0	39	-14
Desmedipham+Acifluorfen	1+.12	0	28	-7
BAS 9052+OC	.2+.25G	0	100	-12
PP-009+OC	.25+.25G	0	83	-14
Desmedipham+BAS 9052	1+.2	0	99	-5
Desmedipham+PP-009	1+.25	0	69	-1
Etho+Desm+BAS 9052+OC	1.5+.75+.2+.25G	0	100	-17
Etho+Desm+PP-009+OC	1.5+.75+.25+.25G	0	97	-4
Mean		0	79	-11
High mean		0	100	0
Low mean		0	28	-24
Coeff. of variation		0	11	-151
LSD(1 Percent)		0	17	32
LSD(5 Percent)		0	13	24
No. of reps		4	4	4

Summary

None of the treatments caused significant sugarbeet injury or stand reduction. Treatments that included PP-009+oil concentrate gave better control of green foxtail than the same treatments without oil concentrate. BAS 9052 gave green foxtail control superior to PP-009.

Postemergence herbicides, Clara City, MN., 1982. ACH 30 sugarbeets were planted 1.25 inches deep in 22 inch rows April 30. Herbicides were applied in 17 gpa of water at 40 psi to the center four rows of six row plots on May 28 when sugarbeets had 2 to 4 leaves, redroot pigweed was from 0.5 to 1 inch tall, common lambsquarters was from 0.5 to 2.5 inches tall, and green and yellow foxtail was emerging to 2.75 inches tall. Weed control and sugarbeet injury were evaluated June 21.

Treatment	Rate (lb/a)	June 21 Sgbt inj ratg	Colq cntl ratg	Grft Yeft cntl ratg	Rrpw cntl ratg
				(%)	
Desmedipham	1	1	96	74	97
Desmedipham+Dalapon	1+2	18	99	96	98
Desmedipham+Endothall	1+.5	9	98	84	98
Ethofumesate+Desmedipham	1.5+.75	11	99	93	99
Desmedipham+BAS 9052+OC	1+.2+.25G	9	98	97	98
Etho+Desm+BAS 9052+OC	1.5+.75+.2+.25G	19	100	99	100
Etho+Desm+PP-009+OC	1.5+.75+.25+.25G	15	98	97	99
BAS 9052+OC	.2+.25G	0	0	98	0
PP-009+OC	.25+.25G	0	0	96	0
Desmedipham+Acifluorfen	1+.06	14	100	76	100
Desmedipham+Acifluorfen	1+.12	18	99	81	99
Mean		10	81	90	81
High mean		19	100	99	100
Low mean		0	0	74	0
Coeff. of variation		51	2	4	1
LSD(1 Percent)		10	3	8	2
LSD(5 Percent)		8	2	6	1
No. of reps		4	4	4	4

Summary

All treatments except desmedipham, BAS 9052 + oil concentrate, and PP-009 + oil concentrate caused sugarbeet injury. All treatments that included desmedipham gave excellent control of common lambsquarters and redroot pigweed. Treatments that included dalapon, BAS 9052, or PP-009 gave excellent control of green and yellow foxtail.

Postemergence herbicides, Galchutt, N.D., 1982. Hilleshog 309 sugarbeets were planted 1.25 inches deep in 22 inch rows April 26. The first half of split applications were applied in 17 gpa of water at 40 psi to the center four rows of six row plots on May 26 when sugarbeets had cotyledonary to 4 leaves, redroot pigweed was emerging to 2 leaves, wild mustard had 2 leaves, common lambsquarters had 2 to 4 leaves, and green and yellow foxtail was 0.5 to 3 inches tall. The second half of the split applications and the rest of the herbicides were applied June 1 when sugarbeets had 2 to 6 leaves, redroot pigweed had 2 to 4 leaves, wild mustard had 4 to 8 leaves, common lambsquarters had 2 to 6 leaves, and green and yellow foxtail was 1 to 4.5 inches tall. Weed control and sugarbeet injury were evaluated June 14 and June 24. Sugarbeets were counted in 60 feet of row and redroot pigweed were counted in 40 square feet in the treated area and in the adjacent untreated areas of each plot on June 29.

Table 1.

Treatment	Rate (lb/a)	June14 Sgbt inj ratg	June24 Sgbt inj ratg	June29 Sgbt stand reduc	June14 Colq cntl ratg	June24 Colq cntl ratg	June14 Wimu cntl ratg	Jun24 Wimu cntl ratg
					(%)			
Desmedipham	1	25	23	2	100	100	100	100
Desmedipham&Phenmedipham	.5+.5	16	20	-14	100	100	100	100
Desmedipham 2X Split	.75	28	29	-14	100	100	100	100
Desm&Phenmed 2X Split	.38+.38	16	15	-9	100	100	100	100
Desmedipham+Dalapon	1+2	36	38	-4	100	100	100	100
Desmed+Dalapon 2X Split	.5+1	11	16	-22	100	100	100	100
Desmedipham+Endothall	1+.5	25	14	-3	100	99	100	100
Desmed+BAS 9052+OC	1+.2+.25G	58	41	0	100	100	100	100
Ethofumesate+Des&Phen	1.5+.8	45	36	-6	100	100	100	100
Desmed+Endoth 2X Split	.5+.25	4	5	-29	100	100	100	100
Desmed&Phenmed+Dalapon	1+2	46	41	1	100	100	100	100
Des&Phen+Dalapon 2X Split	.5+1	33	28	-13	100	100	100	100
Desmed&Phenmed+Endothall	1+.5	29	18	-16	99	100	100	100
Des&Phen+Endo 2X Split	.5+.25	8	5	-10	100	100	100	100
Desmedipham+Acifluorfen	1+.06	43	41	-3	98	98	100	100
Desmedipham+Acifluorfen	1+.12	48	41	-4	100	99	100	99
Desmed+Acifl 2X Split	.5+.06	56	40	-3	100	100	100	100
Mean		31	26	-9	100	100	100	100
High mean		58	41	2	100	100	100	100
Low mean		4	5	-29	98	98	100	99
Coeff. of variation		35	30	-151	1	1	0	1
LSD(1 Percent)		20	15	24	2	2	0	1
LSD(5 Percent)		15	11	18	1	1	0	1
No. of reps		4	4	4	4	4	4	4

(experiment continued on next page)

Postemergence herbicides, Galchutt, N.D., 1982. (continued)

Table 2.

Treatment	Rate (lb/a)	June14 Rrpw cntl ratg	June24 Rrpw cntl ratg	June29 Rrpw stand reduc (%)	June14 Grft Yeft cntl ratg	June24 Grft Yeft cntl ratg
Desmedipham	1	99	94	92	33	33
Desmedipham&Phenmedipham	.5+.5	91	81	89	60	65
Desmedipham 2X Split	.75	100	99	94	91	84
Desmed&Phenmed 2X Split	.38+.38	100	98	98	98	93
Desmedipham+Dalapon	1+2	98	92	92	73	74
Desmedipham+Dalapon 2X Split	.5+1	100	100	98	100	97
Desmedipham+Endothall	1+.5	100	98	93	51	58
Desmedipham+BAS 9052+OC	1+.2+.25G	100	95	95	100	100
Ethofumesate+Des&Phen	1.5+.8	99	98	94	64	61
Desmedipham+Endothall 2X Split	.5+.25	100	98	98	78	65
Desmedipham&Phenmedipham+Dalapon	1+2	91	84	90	69	69
Des&Phen+Dalapon 2X Split	.5+1	99	90	89	100	96
Desmed&Phenmedipham+Endothall	1+.5	89	80	76	56	60
Des&Phen+Endothall 2X Split	.5+.25	96	86	87	92	86
Desmedipham+Acifluorfen	1+.06	95	91	93	31	28
Desmedipham+Acifluorfen	1+.12	98	91	90	31	34
Desmed+Acifluorfen 2X Split	.5+.06	100	97	97	74	59
Mean		97	92	92	71	68
High mean		100	100	98	100	100
Low mean		89	80	76	31	28
Coeff. of variation		3	4	6	13	12
LSD(1 Percent)		6	7	11	17	16
LSD(5 Percent)		5	5	8	13	12
No. of reps		4	4	4	4	4

Summary

All treatments gave nearly total control of wild mustard and common lambsquarters. Split application of desmedipham or desmedipham+phenmedipham at 0.75+0.75 lb/A gave similar sugarbeet injury and better foxtail control than desmedipham or desmedipham+phenmedipham at 1 lb/A. Split applications of half-rates of desmedipham+dalapon, desmedipham+endothall, desmedipham+phenmedipham+dalapon, and desmedipham+phenmedipham+endothall gave less sugarbeet injury and better foxtail control than the single full-rate applications of the same treatments. Single full-rate treatments that included desmedipham+phenmedipham gave less redroot pigweed control than treatments with desmedipham alone.

Postemergence herbicides, St. Thomas, ND., 1982. ACH 30 sugarbeets were planted 1.25 inches deep in 22 inch rows May 13. Herbicides were applied in 17 gpa of water at 40 psi to the center four rows of six row plots on June 15 when sugarbeets had 4 leaves, wild oats was 6 to 8 inches tall, prostrate pigweed was 1.5 to 3 inches in diameter, wild buckwheat was 2 to 5 inches tall and green and yellow foxtail was 1.5 to 6 inches tall. Weed control and sugarbeet injury were evaluated June 30 and sugarbeets were counted in 60 feet of row in the treated area and in the adjacent untreated areas on July 8.

		June 30 Evaluation					July 8
Treatment	Rate (lb/a)	Sgbt inj ratg	Wioa cntl ratg	Prpw cntl ratg	Wibw cntl ratg	Grft Yeft cntl ratg	Sgbt stand reduc
		(%)					
Desmedipham+Acifluorfen	1+.12	10	13	81	59	23	-2
Desmedipham+DOWCO 453+OC	1+.1+.25G	16	97	88	70	100	-16
DOWCO 453+OC	.1+.25G	0	98	0	0	100	-3
Desmedipham+BAS 9052+OC	1+.2+.25G	11	80	91	69	97	-9
BAS 9052+OC	.2+.25G	0	91	0	0	100	-9
Desmedipham+PP-009+OC	1+.25+.25G	8	89	92	84	86	-0
PP-009+OC	.25+.25G	0	95	0	0	89	-18
Desmedipham+DOWCO 453	1+.1	3	78	73	59	85	-20
Desmedipham+Endothall	1+.5	0	38	70	95	48	-7
Desmedipham+BAS 9052	1+.2	0	54	75	50	84	-8
Desmedipham+Dalapon	1+2	10	65	84	68	75	-3
Desmedipham+PP-009	1+.25	1	59	71	49	60	-1
Desmedipham	1	0	15	73	56	30	5
Mean		5	67	61	51	75	-7
High mean		16	98	92	95	100	5
Low mean		0	13	0	0	23	-20
Coeff. of variation		136	14	14	27	21	-222
LSD(1 Percent)		12	18	16	26	37	30
LSD(5 Percent)		9	13	12	19	27	22
No. of reps		4	4	4	4	3	4

Summary

Sugarbeet stand reductions did not correlate with visual ratings of sugarbeet injury and sugarbeet stand reductions were essentially similar for all treatments. Desmedipham+Dowco 453+oil concentrate and desmedipham+BAS 9052+oil concentrate gave more sugarbeet injury and weed control superior to the same herbicides without oil concentrate. Desmedipham + acifluorfen gave more sugarbeet injury and weed control similar to desmedipham alone. Desmedipham+dalapon gave similar sugarbeet injury, similar control of prostrate pigweed and wild buckwheat, and less control of wild oats and foxtail as compared to desmedipham+Dowco 453+oil concentrate and desmedipham+BAS9052+oil concentrate.

Postemergence grass control and desmedipham combinations, Crookston, 1982. Hilleshog 309 sugarbeets were planted 1.25 inches deep in 22 inch rows on May 7. Herbicides were applied in 17 gpa of water at 40 psi to the center four rows of six row plots on June 15 when sugarbeets had 4 to 6 leaves, wild oats were 4 to 12 inches tall, green and yellow foxtail was 1 to 4 inches tall, redroot pigweed was 1 to 3 inches tall, and common lambsquarters was 3 to 6 inches tall. Weed control and sugarbeet injury was evaluated July 1 and sugarbeets were counted in 60 feet of row in the treated area and in the adjacent untreated areas.

		July 1 Evaluation					July12
		Sgbt	Percent Control				Sgbt
Treatment	(lb/a)	%ir	Wioa	Colq	Rrpw	Gr&Yeft	%sr
SC-1058+OC	.2+.25G	0	13	0	0	15	-34
SC-1058+OC	.3+.25G	0	21	0	0	26	-16
PP-009+OC	.25+.25G	0	83	0	0	85	-35
PP-009+OC	.4+.25G	3	95	0	0	97	12
BAS 9052+OC	.2+.25G	0	82	0	0	85	-5
BAS 9052+OC	.3+.25G	0	91	0	0	98	-18
DOWCO 453+OC	.1+.25G	0	98	0	0	92	-17
DOWCO 453+OC	.2+.25G	0	100	2	0	99	-4
PP-009+Desmedipham+OC	.25+1+.25G	19	86	88	85	85	-10
PP-009+Desmedipham+OC	.4+1+.25G	15	95	86	83	96	-7
BAS 9052+Desmedipham+OC	.2+1+.25G	9	75	89	84	96	-3
BAS 9052+Desmedipham+OC	.3+1+.25G	10	88	91	92	100	-25
DOWCO 453+Desmedipham+OC	.1+1+.25G	4	94	84	81	94	-11
DOWCO 453+Desmedipham+OC	.2+1+.25G	15	99	94	91	100	5
PP-009+Endothall+OC	.25+1+.25G	11	81	15	35	89	-2
BAS 9052+Endothall+OC	.2+1+.25G	0	71	8	20	98	-14
DOWCO 453+Endothall+OC	.1+1+.25G	4	96	14	34	93	-1
Desmedipham+OC	1+.25G	10	19	91	91	33	-3
Endothall+OC	1+.25G	10	32	10	55	75	-4
Desmedipham	1	0	10	84	85	38	4
Endothall	1	0	3	0	25	38	-19
PP-009+Desmedipham	.25+1	10	63	81	88	55	-10
BAS 9052+Desmedipham	.2+1	8	48	81	83	84	-7
DOWCO 453+Desmedipham	.1+1	3	45	82	81	69	10
PP-009+Endothall	.25+1	0	35	3	30	79	-1
BAS 9052+Endothall	.2+1	3	40	1	1	88	-15
DOWCO 453+Endothall	.1+1	5	36	5	13	59	-10
PP-009+Desm+OC Pre-mix	.25+1+.25G	13	74	88	91	79	-6
Diclofop	1.5	0	51	0	0	88	-10
Dalapon+Surfactant	3+.5%	5	54	8	10	60	1
Ethofumesate+Dalapon+Surf.	1+3+.5%	9	74	84	71	79	-9
Mean		5	63	38	43	76	-8
High mean		19	100	94	92	100	12
Low mean		0	3	0	0	15	-35
Coeff. of variation		112	17	19	21	16	-216
LSD(1 Percent)		11	20	14	17	23	33
LSD(5 Percent)		8	15	10	13	17	25
No. of reps		4	4	4	4	4	4

Summary

Ethofumesate+dalapon+surfactant gave weed control superior to dalapon+surfactant. PP-009+oil concentrate (OC), BAS 9052+OC, and Dowco 453+OC gave wild oat control superior to SC-1058+OC, diclofop, and dalapon+surfactant. Desmedipham plus PP-009+OC, BAS 9052+OC, or Dowco 453+OC gave grass control similar to the same herbicides without desmedipham. Thus antagonism was not observed at this location. Desmedipham plus PP-009, BAS 9052, or Dowco 453 gave less grass control without oil concentrate than with oil concentrate.

Postemergence herbicides, Grand Forks, 1982. ACH 30 sugarbeets were planted 1.25 inches deep in 22 inch rows on May 24. Herbicides were applied in 17 gpa of water at 40 psi to the center four rows of six-row plots June 26 when sugarbeets had 2 to 6 leaves, green foxtail was emerging to 1.5 inches tall, and quackgrass was 6 to 8 inches tall. Weed control and sugarbeet injury were evaluated July 16 and sugarbeets were counted in 60 feet of row in the treated area and in the adjacent untreated areas.

Treatment	Rate (lb/a)	July 16 Sgbt inj ratg	July 16 Grft cntl ratg	July 16 Qkgr cntl ratg	Aug.11 Sgbt stand reduc
				(%)	
Desmedipham	1	0	53	5	14
Ethofumesate+Des&Phen	1.5+.8	14	95	41	23
Desmedipham 2X Split	.75	6	71	34	17
Desmedipham+Dalapon	1+2	28	95	64	19
Desmedipham+Dalapon 2X Split	.5+1	21	98	71	19
Ethofumesate+Desmed 2X Split	.75+.5	6	92	30	13
Desmedipham+Endothall	1+.5	1	55	5	15
Desmedipham+BAS 9052	1+.2	0	85	45	20
Desmedipham+Endothall 2X Split	.5+.25	6	60	23	37
Desmedipham+BAS 9052+OC	1+.2+.25G	24	98	76	6
Desm+BAS 9052+OC 2X Split	.5+.1+.25G	18	100	78	5
Desmedipham+Acifluorfen	1+.06	10	55	30	22
Desmedipham+Acifluorfen	1+.12	6	40	15	22
Desmed+Acifluorfen 2X Split	.5+.06	10	50	25	17
Desmedipham&Phenmedipham	1	8	75	68	16
Desmedipham&Phenmedipham+OC	1+.25G	4	81	23	13
Desmedipham&Phenmedipham 2X Split	.75	8	96	50	11
Des&Phen+Dalapon 2X Split	.5+1	16	99	82	4
Mean		10	78	42	16
High mean		28	100	82	37
Low mean		0	40	5	4
Coeff. of variation		85	13	61	127
LSD(1 Percent)		16	20	49	38
LSD(5 Percent)		12	15	37	29
No. of reps		4	4	4	4

Summary

Split applied desmedipham+dalapon, desmedipham+BAS 9052+OC, split applied desmedipham+BAS 9052+OC, and split applied desmedipham+phenmedipham+dalapon gave 70% or greater control of quackgrass. Desmedipham + phenmedipham gave grass control superior to desmedipham.

Postemergence grass control herbicides, Casselton, N.D., 1982. Beta 1345 sugarbeets were planted April 27. Herbicides were applied in 17 gpa of water at 40 psi on May 27 when sugarbeets were cotyledon to 4 leaf, wild oat were just emerging to 11 inches tall, and common lambsquarters was cotyledon to 4 leaf. Wild oat control was evaluated June 14 and July 15 and common lambsquarters control was evaluated June 14. Sugarbeet populations were too erratic for evaluation.

Treatment	Rate (lb/a)	July15 Wioa cntl ratg	-- June 14 -- Wioa cntl ratg	Colq cntl ratg
		----------	(%)	---------
SC-1058+OC	.2+.25G	14	16	0
SC-1058+OC	.3+.25G	77	66	0
PP-009+OC	.25+.25G	99	99	0
PP-009+OC	.4+.25G	100	100	0
BAS 9052+OC	.2+.25G	84	89	0
BAS 9052+OC	.3+.25G	100	100	0
DOWCO 453+OC	.1+.25G	99	100	0
DOWCO 453+OC	.2+.25G	100	100	0
PP-009+Desmedipham+OC	.25+1+.25G	83	98	99
PP-009+Desmedipham+OC	.4+1+.25G	93	100	99
BAS 9052+Desmedipham+OC	.2+1+.25G	50	80	100
BAS 9052+Desmedipham+OC	.3+1+.25G	39	83	98
DOWCO 453+Desmedipham+OC	.1+1+.25G	97	100	98
DOWCO 453+Desmedipham+OC	.2+1+.25G	99	100	99
PP-009+Endothall+OC	.25+1+.25G	93	98	0
BAS 9052+Endothall+OC	.2+1+.25G	79	91	0
DOWCO 453+Endothall+OC	.1+1+.25G	99	99	0
Desmedipham+OC	1+.25G	0	0	100
Endothall+OC	1+.25G	25	36	0
Desmedipham	1	0	0	100
Endothall	1	1	0	0
BAS 9052+Desmedipham	.2+1	13	61	99
DOWCO 453+Desmedipham	.1+1	96	100	100
PP-009+Endothall	.25+1	94	97	0
BAS 9052+Endothall	.2+1	43	66	0
DOWCO 453+Endothall	.1+1	94	98	0
PP-009+Desm+OC Pre-mix	.25+1+.25G	80	97	97

(table continued on next page)

Table . Continued

Treatment	Rate (lb/a)	July15 Wioa cntl ratg	-- June 14 -- Wioa cntl ratg	Colq cntl ratg
		----------(%)----------		
Diclofop	1.5	96	88	38
Dalapon+Surfactant	3+.5%	43	71	13
Ethofumesate+Dalapon+Surf.	1+3+.5%	59	81	75
SC-1058+Desmedipham	.2+1	3	9	98
SC-1058+Endothall	.2+1	15	39	0
SC-1058+Desmedipham+OC	.2+1+.25G	3	4	100
SC-1058+Desmedipham+OC	.3+1+.25G	0	15	97
SC-1058+Endothall+OC	.2+1+.25G	43	65	0
SC-1058+Endothall+OC	.3+1+.25G	54	73	0
Ethofumesate+Desm+BAS 9052	1.5+.75+.2	48	78	100
Barban	1	36	51	0
Mean		59	70	42
High mean		100	100	100
Low mean		0	0	0
Coeff. of variation		23	14	8
LSD(1 Percent)		25	18	6
LSD(5 Percent)		19	13	5
No. of reps		4	4	4

Summary

Sc-1058, dalapon, and barban gave less effective wild oat control than BAS 9052, Dowco 453, PP-009, and diclofop. The addition of desmedipham reduced wild oat control from BAS 9052 and tended to reduce wild oat control from PP-009 on July 15. Dowco 453 gave similar wild oat control alone or in combination with desmedipham. Desmedipham+BAS 9052+oil concentrate and endothall + BAS 9052 + oil concentrate gave better wild oat control than the same herbicides without the oil additive. All treatments that included desmedipham gave excellent common lambsquarters control.

General wild oat control in wheat, Fargo 1981-82. Fall triallate treatments were applied October 26 to chisel plowed soil and incorporated once with a field cultivator to a depth of 3 inches immediately after application (FI) or not incorporated (FS). The entire experimental area was field cultivated and harrowed, Era wheat seeded and spring triallate applied and harrow incorporated twice (SLI) April 26. Postemergence treatments were applied May 20 to 1.5 to 2-leaf wheat and wild oat or May 26 to 3.5 to 4-leaf wheat and wild oat. The granular formulation of triallate (G) was applied with a cone applicator and all other treatments with a bicycle wheel sprayer delivering 17 gpa at 35 psi for preemergene treatments and 8.5 gpa for postemergence treatments except barban which was applied in 4.5 gpa at 45 psi. The experimental design was a randomized complete block with 4 replications and experimental units 8 by 24 ft. Wild oat stand was 15 plants/square ft and control rated July 9.

Treatment	Rate lb/A	Wheat Yield bu/A	Wheat %ir	Wheat %sr	% Control Wioa	% Control Fxtl
Triallate-G FGI	1	43.3	0	1	83	0
Triallate-G FGS	1	43.4	0	0	82	0
Triallate FLI	1	41.0	0	0	76	0
Triallate SLI	1	44.6	0	0	77	0
Barban 2-L	0.37	39.2	0	0	82	0
Barban+Nitrogen 2-L	0.37+1G	42.0	0	0	80	0
Diclofop 2-L	0.75	49.6	0	0	91	78
Diclofop 2-L	1	50.7	0	0	93	84
Diclofop+Bromoxynil 2-L	0.75+0.25	57.0	0	0	95	84
SD-45328 2-L	0.25	49.3	0	0	89	0
Barban+Nitrogen 4-L	0.5+1G	40.1	0	0	82	0
Diclofop 4-L	1.25	53.2	0	0	94	96
Diclofop+Bromoxynil 4-L	1.25+0.25	52.4	0	0	92	90
Difenzoquat 4-L	0.75	48.2	4	0	97	0
Difenzoquat 4-L	0.71	47.3	13	0	98	0
Difenzoquat+2,4-D 4-L	0.75+0.25	44.6	4	0	92	0
SD-45328 4L	0.18	47.2	0	0	90	0
SD-45328 4L	0.25	55.0	0	0	100	0
Control		16.1	0	0	0	0
Mean		45.5	1	0	84	23
High mean		57.0	13	1	100	96
Low mean		16.1	0	0	0	0
Coeff. of variation		11.6	155	872	6	15
LSD(1 Percent)		9.9	3	1	9	6
LSD(5 Percent)		7.5	2	1	7	5
No. of reps		4.0	4	4	4	4

Summary

Wild oat control was 75% or greater with all treatments and 90% or greater with diclofop, SD-45328, or difenzoquat; however, difenzoquat caused slight wheat injury. Green foxtail control with diclofop was better at the 4 than 2-leaf stage. Herbicide treatments increased wheat yields 23 to 41 bu/A compared to the untreated control and generally related to wild oat control and/or crop injury.

Effect of various herbicides on wild oat seed production, Fargo 1982. Era wheat was seeded and triallate applied and harrow incorporated twice April 29. Postemergence treatments were applied May 24 to 1.5 to 2-leaf wheat and wild oat or May 29 to 3.5 to 4-leaf wheat and wild oat. Herbicide treatments were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi for preemergence treatments and 8.5 gpa for postemergence treatments. The experimental design was a randomized complete block with 4 replications and experimental units 10 by 30 ft. Wild oat stand was 20 plants/square ft and control related July 12.

		Wheat			Wild Oat			
	Rate	%		Yield	Cntr	Panicles/	Seed/	Seed/
Treatment	oz/A	Inj	SR	bu/A	%	3 ft^2	Panicle	3 ft^2
Triallate PEI	16	0	0	25.1	66	41	37	1517
Barban 2L	6	0	0	22.3	59	71	27	1917
Diclofop 2L	12	0	0	28.2	81	40	32	1280
Difenzoquat 4L	12	0	0	22.5	62	60	23	1380
Tria + barb PEI+2L	16+6	0	0	30.2	88	28	34	952
Tria + dicl PEI+2L	16+12	0	0	33.9	94	4	26	104
Tria + dife PEI+4L	16+12	0	0	31.0	91	10	28	280
Control	-----	0	0	13.6	0	150	35	5250
LSD (0.05)		0	0	6.5	10	30	12	400

SUMMARY

Wild oat control was better with triallate-postemergence herbicide combinations than with the individual herbicides applied alone. Triallate-diclofop combinations reduced wild oat seed production 98% compared to the untreated control.

Fall applications of triallate and trifluralin in wheat, Absaraka 1981-82. Herbicide treatments were applied on a loamy sand soil pH 7.3 and 3.7% organic matter October 30 and not incorporated (S) or incorporated once with a tandem disc to a depth of 3 inch (I) immediately after application. The entire experimental area was field cultivated and harrowed prior to seeding Era wheat May 21. The liquid formulations (L) were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi and the granular formulations (G) applied with a cone applicator. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 27 ft. Foxtail and common lambsquarters densities were light and weed control and crop injury ratings made June 21.

		------Wheat------			% Control		--Wheat---	
Treatment	Rate lb/A	Yield bu/A	%ir	%sr	Fxtl	Colq	Hght	Spike
Triallate-G FGI	1	25.1	0	1	10	0	70	84
Triallate-G FGS	1	24.0	0	4	10	0	67	79
Triallate FLI	1	25.8	0	3	13	0	68	81
Triallate FLS	1	25.8	0	0	0	0	69	87
Trifluralin-G	0.75	20.7	5	33	98	99	67	82
Trifluralin-G	0.75	23.7	3	24	94	94	67	81
Trifluralin FLI	0.75	22.3	0	31	93	98	69	71
Trifluralin FLS	0.75	27.2	0	1	49	33	68	79
Triallate-G+Trifluralin-G FGI	1+0.75	24.3	0	34	95	98	69	76
Triallate-G+Trifluralin-G FGS	1+0.75	26.1	0	19	86	91	70	84
Triallate+Trifluralin FLI	1+0.75	26.9	0	22	94	98	70	83
Triallate+Trifluralin FLS	1+0.75	26.6	0	0	33	28	68	72
Control		24.5	0	0	0	0	71	78
Mean		24.9	1	13	52	49	69	80
High mean		27.2	5	34	98	99	71	87
Low mean		20.7	0	0	0	0	67	71
Coeff. of variation		12.0	358	56	36	30	3	17
LSD(1 Percent)		5.7	4	14	35	28	4	26
LSD(5 Percent)		4.3	3	11	26	21	3	20
No. of reps		4.0	4	4	4	4	4	4

Summary

Foxtail and common lambsquarters control with trifluralin was good with fall application of granules surface applied and incorported or the liquid incorporated. Wheat stand was reduced 19 to 34% with fall application of trifluralin granules surface applied and incorporated or the liquid incorporated alone or in combination with triallate.

Fall applications of triallate and trifluralin, Minot 1981-82. Herbicide treatments were applied on fallowed soil October 27 and not incorporated (S) or incorporated twice with a field cultivator to a depth of 3 inch (I) immediately after application. The entire experimental area was field cultivated and harrowed prior to seeding Coteau wheat April 23. The liquid formulations (L) were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi and the granular formulations (G) applied with a cone applicator. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 30 ft. Wild oat and foxtail densities were light (<2 plants/square ft) and weed control and crop injury ratings made July 14.

		--------Wheat--------			-% Control-	
Treatment	Rate lb/A	Yield bu/A	%ir	%sr	Wioa	Fxtl
Triallate-G FGI	1	54.9	0	3	94	0
Triallate-G FGS	1	56.1	0	0	85	0
Triallate FLI	1	60.6	0	0	93	0
Triallate FLS	1	55.3	0	0	63	0
Trifluralin-G	0.75	51.3	0	5	23	94
Trifluralin-G	0.75	53.6	0	3	13	81
Trifluralin FLI	0.75	49.0	3	13	25	96
Trifluralin FLS	0.75	58.4	0	1	8	55
Triallate-G+Trifluralin-G FGI	1+0.75	50.7	5	16	94	97
Triallate-G+Trifluralin-G FGS	1+0.75	52.6	0	8	82	90
Triallate+Trifluralin FLI	1+0.75	50.8	1	10	95	98
Triallate+Trifluralin FLS	1+0.75	55.1	1	4	65	77
Control		48.3	0	0	0	0
Mean		53.6	1	5	57	53
High mean		60.6	5	16	95	98
Low mean		48.3	0	0	0	0
Coeff. of variation		5.8	289	102	30	18
LSD(1 Percent)		6.0	4	9	33	18
LSD(5 Percent)		4.5	3	7	25	13
No. of reps		4.0	4	4	4	4

Summary

Wild oat control with triallate and green foxtail control with trifluralin was good with fall application of granules surface applied or incorporated and the liquid incorporated. Wheat stand was reduced 10% or more by incorporation of trifluralin liquid or incorporation of granular and liquid triallate-trifluralin combinations.

Fall applications of triallate and trifluralin in wheat, Williston 1981-82. Herbicide treatments were applied on fallowed soil October 28 and not incorporated (S) or incorporated twice with a field cultivator to a depth of 3 inches immediately after application (I). The entire experimental area was field cultivated and harrowed prior to seeding Len wheat May 3. The liquid formulations (L) were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi and the granular formulations (G) with a cone applicator. The experimental design was a randomized complete block with 4 replications and experimental units 10 by 27 ft. Wild oat and Russian thistle densities were light (<2 plants/sq ft) and weed control and crop injury ratings made July 15.

Treatment	Rate lb/A	Wheat Yield bu/A	Wheat % IR	Wheat % Sr	Percent control Wioa	Percent control Ruth
Triallate FGI	1	39.1	0	0	89	0
Triallate FGS	1	33.7	0	0	83	0
Triallate FLI	1	31.5	0	0	90	0
Triallate FLS	1	33.9	0	0	56	0
Trifluralin FGI	0.75	34.8	0	0	48	90
Trifluralin FGS	0.75	29.0	0	0	18	40
Trifluralin FLI	0.75	32.8	0	0	43	90
Trifluralin FLS	0.75	33.6	0	0	0	0
Trial + Trif FGI	1+0.75	33.5	3	8	92	90
Trial + Trif FGS	1+0.75	29.2	0	0	85	50
Trial + Trif FLI	1+0.75	30.7	3	5	93	90
Trial + Trif FGS	1+0.75	26.2	0	0	55	20
Control		27.2	0	0	0	0
Mean		31.9	0	1	58	36
High mean		39.1	3	8	93	90
Low mean		26.2	0	0	0	0
Coeff. of variation		16.9	488	180	24	20
LSD (1 percent)		10.4	4	4	26	15
LSD (5 percent)		7.8	3	3	19	12
No. of reps		4	4	4	4	3

Summary

Wild oat control with fall triallate was good with the granules surface applied or incorporated and the liquid incorporated. Russian thistle control with either formulation of trifluralin applied in the fall was good when incorporated but not surface applied. Incorporated triallate-trifluralin combinations were the only treatments which reduced wheat stand.

Triallate combinations with other herbicides in wheat, Fargo 1982. Era wheat was seeded in 6 inch row spacings, herbicide treatments applied with a bicycle wheel plot sprayer delivering 17 gpa at 35 psi and treatment harrow incorporated twice April 27. The soil was dry to a depth of 1 inch and rainfall for a 2 week period following application was 0.84 inch. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 20 plants/square ft and weed control and crop injury made July 9.

Treatment	Rate oz/A	----Wheat----- %ir	%sr	Percent Control Wioa	Wimu
Triallate	16	0	0	63	0
Triallate+Chlorsulfuron	16+0.12	0	0	75	98
Triallate+Chlorsulfuron	16+0.25	0	0	73	98
Triallate+Chlorsulfuron	16+0.37	0	0	66	99
Triallate+Chlorsulfuron	16+0.5	0	0	74	100
Triallate+Trifluralin	16+12	0	0	66	0
Triallate+SSH-0860	16+16	0	0	70	93
Triallate+SSH-0860	16+24	0	0	68	99
Triallate+Pendimethalin	16+16	0	0	70	0
Triallate+Fluchloralin	16+12	0	0	65	0
Tria+Trif+Chlorsulfuron	16+8+0.25	0	0	73	100
Triallate+DPX-T6376	16+0.12	0	0	73	96
Triallate+DPX-T6376	16+0.25	0	0	70	100
Control		0	0	0	0
Mean		0	0	65	63
High mean		0	0	75	100
Low mean		0	0	0	0
Coeff. of variation		0	0	10	4
LSD(1 Percent)		0	0	12	5
LSD(5 Percent)		0	0	9	4
No. of reps		4	4	4	4

Summary

Wild oat control with triallate generally was slightly better in combinations with other herbicides than when applied alone. Wild mustard control was excellent with all rates of chlorsulfuron, DPX-T6376 or SSH-0860.

Triallate-Carboxin combinations in wheat, Fargo 1982. Triallate was applied and field cultivator incorporated twice (PPI), Era wheat treated or non-treated with carboxin seeded in 6 inch row spacings, and triallate applied and harrow incorporated twice (PEI) April 27. The soil was dry to a depth of 1 inch and rainfall for a 2 week period following application was 0.84 inch. All treatments were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units 8 by 27 ft. Wild oat density was 10 plants/square ft and weed control and crop injury ratings made July 9.

Treatment	Rate lb/A	------Wheat------- %ir	%sr	% Control Wioa
Triallate PPI Control		0	0	0
Triallate PPI	.5	0	0	86
Triallate PPI	.75	0	0	94
Triallate PPI	1	0	5	97
Triallate+Carboxin PPI Control	.	0	0	0
Triallate+Carboxin PPI	.5	0	0	84
Triallate+Carboxin PPI	.75	0	0	91
Triallate+Carboxin PPI	1	0	0	92
Triallate PEI Control		0	0	0
Triallate PEI	.5	0	0	78
Triallate PEI	.75	0	0	77
Triallate PEI	1	0	0	83
Mean		0	0	65
High mean		0	5	97
Low mean		0	0	0
Coeff. of variation		0	400	8
LSD(1 Percent)		0	3	10
LSD(5 Percent)		0	2	7
No. of reps		4	4	4

Summary

Little crop injury was observed with any treatment. Wild oat control was better with PPI than PEI applications. Wild oat control with 0.5 lb/A triallate PPI was similar to control with 1.0 lb/A PEI.

Preemergence herbicides for wild oat control in wheat, Fargo 1982. Preplant treatments were applied and incorporated twice with a field cultivator (PPI), Era wheat seeded in 6 inch row spacings, preemergence incorporated treatments applied and harrowed twice (PEI) and preemergence (PE) treatments applied April 27. The soil was dry to a depth of 1 inch and rainfall for a 2 week period following application was 0.84 inch. All treatments were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units 10 by 24 ft. Wild oat density was 20 plants/square ft and weed control and crop injury ratings made July 9.

Treatment	Rate lb/A	------Wheat------- %ir	%sr	--Percent Control-- Wioa	Wimu
Triallate PPI	1	0	0	90	0
SSH-0860 PPI	1.5	0	0	28	100
SSH-0860 PPI	2	0	0	54	100
SSH-0860 PPI	3	0	0	60	100
Triallate PEI	1	0	0	80	0
SSH-0860 PEI	1.5	0	0	30	100
SSH-0860 PEI	2	0	0	25	100
SSH-0860 PEI	3	0	0	37	100
CGA-82725 PEI	0.25	0	0	10	0
CGA-82725 PEI	0.37	0	0	18	0
CGA-82725 PEI	0.5	0	0	31	0
CGA-82725 PEI	1	0	0	34	0
AC-222293 PEI	0.37	0	0	0	0
AC-222293 PEI	0.5	0	0	9	0
AC-222293 PEI	0.75	0	0	26	0
Triallate PE	1	0	0	36	0
SSH-0860 PE	1.5	0	0	30	93
SSH-0860 PE	2	0	0	5	93
SSH-0860 PE	3	0	0	20	100
CGA-82725 PE	0.25	0	0	11	0
CGA-82725 PE	0.37	0	0	0	0
CGA-82725 PE	0.5	0	0	20	0
CGA-82725 PE	1	0	0	10	0
AC-222293 PE	0.37	0	0	5	0
AC-222293 PE	0.5	0	0	18	0
AC-222293 PE	0.75	0	0	18	0
Control		0	0	0	0
Mean		0	0	26	33
High mean		0	0	90	100
Low mean		0	0	0	0
Coeff. of variation		0	0	75	10
LSD(1 Percent)		0	0	36	6
LSD(5 Percent)		0	0	27	4
No. of reps		4	4	4	4

Summary

PPI or PEI applications of triallate were the only treatment which effectively controlled wild oat. Wild mustard control was good with SSH-0860 at 1.5 to 3 lb/A regardless of method of application.

Hard red spring wheat response to SSH-0860, Fargo 1982. Ten wheat cultivars were seeded in silty clay soil pH 7.9 and 6.0% organic matter April 28. SSH-0860 was applied preemergence and harrow incorporated twice (PEI) or left undisturbed on the surface (PE) April 29. Precipitation for a 2 week period following application was 0.84 inch. Treatments were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 3 replications. Experimental units were 10 by 12 ft. Injury was evaluated June 18 and plots harvested August 13.

	% Injury			Yield bu/A			
	SSH-0860 3 lb/A				SSH-0860 3 lb/A		
Cultivar	PEI	PE	Mean	Control	PEI	PE	Mean
Era	0	2	1	47.1	48.1	51.7	48.9
Solar	0	0	0	45.3	49.9	48.6	47.9
Len	0	0	0	47.1	49.4	50.1	48.8
James	0	0	0	47.1	48.5	48.1	47.9
Waldron	0	0	0	43.3	44.7	42.3	43.4
Coteau	2	0	1	39.2	43.8	42.9	41.9
Alex	0	2	1	42.3	46.8	45.1	44.7
Butte	0	0	0	40.4	43.2	38.1	40.6
PB711	0	0	0	50.8	47.6	45.5	48.0
Oslo	3	0	1	45.4	44.9	43.4	44.6
Mean	0	0		44.8	46.7	45.6	45.7
LSD (0.05)	TRT 4 CULT 3			TRT 3 CULT 8			
	TRT x CULT 10			TRT x CULT 10			

Summary

Hard red spring wheat tolerance to SSH-0860 was excellent regardless of cultivar. Visual injury to wheat did not exceed 3% for any cultivar regardless of method of application. Further SSH-0860 did not reduce the yield of any wheat cultivar when applied at 3 lb/A PEI or PE.

MBR-compounds with safeners in wheat, Fargo 1982. Era wheat treated or non-treated with napthalic anhydride was seeded in 6 inch row spacings and treatments applied and harrow incorporated twice April 27. The soil was dry to a depth of 1 inch and rainfall for a 2 week period following application was 0.84 inch. All treatments were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 27 ft. Wild oat density was 10 plants/square ft and weed control and crop injury ratings made July 9.

Treatment	Rate lb/A	Wheat		% Control
		%ir	%sr	Wioa
MBR - Control PEI		0	0	0
MBR-22359 PEI	3	0	45	51
MBR-23709 PEI	3	0	9	23
MBR-20457 PEI	3	0	39	73
MBR - Safener Control		0	0	0
MBR-22359 Safener PEI	3	0	48	66
MBR-23709 Safener PEI	3	0	0	26
MBR-20457 Safener PEI	3	0	30	74
Mean		0	21	39
High mean		0	48	74
Low mean		0	0	0
Coeff. of variation		0	50	43
LSD(1 Percent)		0	21	34
LSD(5 Percent)		0	16	25
No. of reps		4	4	4

Summary

Wheat stands were reduced 30% or more by MBR-22359 and MBR-20457 with or without napthalic anhydride. Little wheat injury was observed with MBR-23709 with or without a safener.

Barban-Chlorpropham combination in wheat, Fargo 1982. Era wheat was seeded April 27 in 6 inch row spacings. Herbicide applications were made to 1 1/2 to 2 leaf wheat and wild oat May 20. Treatments were applied with a bicycle wheel sprayer delivering 4.5 gpa at 45 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 10 plants/square ft and weed control and crop injury ratings made July 9.

Treatment	Rate oz/A	Wheat		% Control
		%ir	%sr	Wioa
Barban	2	0	0	56
Barban	4	0	0	61
Barban	6	0	0	74
Barban+CIPC	2+4	0	0	36
Barban+CIPC	2+8	0	0	53
Barban+CIPC	4+4	0	0	65
Barban+CIPC	4+8	0	0	71
Barban+N	4+1G	0	0	75
Barban+CIPC+N	4+4+1G	0	0	78
Barban+CIPC+N	4+8+1G	0	0	71
Chlorpropham	4	0	0	0
Chlorpropham	8	0	0	10
Control		0	0	0
Mean		0	0	50
High mean		0	0	78
Low mean		0	0	0
Coeff. of variation		0	0	24
LSD(1 Percent)		0	0	23
LSD(5 Percent)		0	0	17
No. of reps		4	4	4

Summary

Wild oat control with barban was not influenced by CIPC and increased slightly by the addition of nitrogen. No wheat injury was observed with any treatment.

Herbicide combinations in wheat, Fargo 1982. Era wheat was seeded April 27 in 6 inch row spacings. Herbicide applications were made to 1 1/2 to 2 leaf wheat and wild oat May 20. Treatments were applied with a bicycle wheel sprayer delivering 4.5 gpa at 45 psi except diclofop was applied in 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 10 plants/square ft and weed control and crop injury ratings made July 9.

Treatment	Rate oz/A	---Wheat---- %ir	%sr	--% Control--- Wioa	Wimu
Barban	4	0	0	48	0
Barban	6	0	0	49	0
Diclofop	8	0	0	68	0
Diclofop	12	0	0	83	0
Barban+Diclofop	4+8	0	0	71	0
Barban+Propanil	6+1.12	0	0	55	68
Barban+Propanil	6+1.5	0	0	49	78
Barban+Bromoxynil	4+4	0	0	34	95
Barban+Bromoxynil+MCPA	6+4+4	0	0	13	100
Barban+Bromoxynil	6+4	0	0	55	94
Barban+Diclofop+Bromoxynil	4+8+4	1	0	76	96
Diclofop+Bromoxynil	12+4	0	0	90	99
Control		0	0	0	0
Mean		0	0	53	48
High mean		1	0	90	100
Low mean		0	0	0	0
Coeff. of variation		721	0	22	17
LSD(1 Percent)		1	0	22	16
LSD(5 Percent)		1	0	16	12
No. of reps		4	4	4	4

Summary

Wild oat control with barban was reduced by bromoxynil at 4 but not at 6 oz/A. No wheat injury was observed with any treatment.

Difenzoquat formulation comparison in wheat, Fargo 1982. Era wheat was seeded April 28 in 6 inch row spacings. Herbicide applications were made to 4 to 5-leaf wheat and wild oat June 1. Treatments were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 15 plants/square ft and weed control and crop injury ratings made July 12.

Treatment	Rate oz/A	------Wheat------- %ir	%sr	% Control Wioa
Difenzoquat	12	0	0	45
Difenzoquat	16	0	0	70
Difenzoquat(AS)	12	0	0	61
Difenzoquat(AS)	16	0	0	76
Difenzoquat+MCPA amine	12+4	0	0	54
Difenzoquat(AS)+MCPA amine	12+4	0	0	69
Difenzoquat+2,4-D Amine	12+4	0	0	29
Difenzoquat(AS)+2,4-D Amine	12+4	0	0	50
Difenzoquat+2,4-D ester	12+4	0	0	63
Difenzoquat(AS)+2.4-D ester	12+4	0	0	73
Control		0	0	0
Mean		0	0	54
High mean		0	0	76
Low mean		0	0	0
Coeff. of variation		0	0	21
LSD(1 Percent)		0	0	22
LSD(5 Percent)		0	0	16
No. of reps		4	4	4

Summary

Wild oat control with difenzoquat alone was similar regardless of formulation; however, the amine formulation of 2,4-D reduced wild oat control more with the S then AS formulation.

Hard red spring wheat response to difenzoquat, Fargo 1982. Ten wheat cultivars were seeded in silty clay soil pH 7.9 and 6.0% organic matter April 28. Difenzoquat was applied with a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi to 4 to 5-leaf wheat on May 28. Precipitation for a 2 week period following application was 1.26 inch. The experiment was a randomized complete block with three replications. Experimental units were 10 by 12 ft. Injury was evaluated June 18 and plots harvested August 13.

	% Injury	Yield bu/A	
Cultivar	difenzoquat 16 oz/A	Control	Difenzoquat 16 oz/A
Era	11	47.1	46.3
Solar	10	45.3	47.7
Len	52	47.1	34.4
James	16	47.1	28.1
Waldron	83	43.3	30.9
Coteau	26	39.2	39.0
Alex	62	42.3	36.9
Butte	8	40.4	43.1
PB711	5	50.8	48.5
Oslo	5	45.4	46.3
Mean	25	44.8	40.1
LSD (0.05)	10	10	

Summary

Difenzoquat reduced wheat yields 11% when averaged over cultivar. However, yield reductions were cultivar dependent. Difenzoquat at 1 lb/A significantly reduced yield of Len, James and Waldron in this study.

Postemergence application of AC-222293 in wheat, Fargo 1982. Era wheat was seeded April 26 in 6 row spacings. Herbicide applications were made to 1 1/2 to 2 leaf wheat and wild oat May 20 and 3 1/2 to 4 leaf wheat and wild oat May 28. Precipitation for a 2 week period following application was 0.21 inch at the 2-leaf and 1.26 inch at the 4-leaf stage. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 10 plants/ft square and weed control and crop injury ratings were made July 8.

		Wheat			% Control	
Treatment	Rate oz/A	Yield bu/A	%ir	%sr	Wioa	Wimu
Diclofop 2	12	37.7	0	0	83	0
AC-222293+S 2	6+.25%	52.8	0	0	94	96
AC-222293+S 2	8+.12%	52.0	0	0	97	98
AC-222293+S 2	8+.25%	52.7	0	0	99	99
AC-222293+S 2	8+.5%	58.9	0	0	99	100
AC-222293+S 2	10+.25%	55.5	0	0	100	100
AC-222293+S 2	12+.25%	49.8	0	0	100	100
Difenzoquat 4	12	36.1	0	0	88	0
AC-222293+S 4	6+.25%	41.0	0	0	97	98
AC-222293+S 4	8+.12%	39.2	0	0	97	96
AC-222293+S 4	8+.25%	46.3	0	0	99	100
AC-222293+S 4	8+.5%	43.4	0	0	98	99
AC-222293+S 4	10+.25%	41.9	0	0	97	100
AC-222293+S 4	12+.25%	47.8	0	0	96	96
Control		17.5	0	0	0	0
Mean		44.8	0	0	89	79
High mean		58.9	0	0	100	100
Low mean		17.5	0	0	0	0
Coeff. of variation		15.1	0	0	4	4
LSD(1 Percent)		12.7	0	0	7	5
LSD(5 Percent)		9.6	0	0	5	4
No. of reps		4.0	4	4	4	4

Summary

Wild oat and wild mustard control with AC-222293 was excellent at both stages of application. No crop injury was observed with any treatment. AC-222293 increased wheat yields compared to the untreated control 32 to 41 bu/A at the 2-leaf stage and 24 to 30 bu/A at the 4-leaf stage.

Postemergence application of AC-222293 in wheat, Fargo NW22 1982. Era wheat was seeded April 28 in 6 inch row spacings. Herbicide applications were made to 1 1/2 to 2-leaf wheat and wild oat May 20 and to 3 1/2 to 4-leaf wheat and wild oat May 28. Precipitation for a 2 week period following application was 2.21 inch at the 2-leaf stage and 1.26 at the 4-leaf stage. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 feet. Wild oat density was 15 plants/ft square and weed control and crop injury ratings made July 12.

		Wheat			% Control	
Treatment	Rate oz/A	Yield bu/A	%ir	%sr	Wioa	Wimu
Diclofop 2	12	27.2	0	0	73	23
AC-222293+S 2	6+.25%	35.3	0	0	97	98
AC-222293+S 2	8+.12%	41.3	0	0	98	98
AC-222293+S 2	8+.25%	39.2	0	0	98	99
AC-222293+S 2	8+.5%	41.3	0	0	98	96
AC-222293+S 2	10+.25%	42.7	0	0	99	99
AC-222293+S 2	12+.25%	39.0	0	0	96	96
Difenzoquat 4	12	17.4	0	0	65	0
AC-222293+S 4	6+.25%	21.4	0	0	82	96
AC-222293+S 4	8+.12%	30.2	0	0	93	99
AC-222293+S 4	8+.25%	30.3	0	0	86	93
AC-222293+S 4	8+.5%	25.0	0	0	73	95
AC-222293+S 4	10+.25%	24.8	0	0	81	99
AC-222293+S 4	12+.25%	26.1	0	0	93	98
Control		11.1	0	0	0	0
Mean		30.2	0	0	82	79
High mean		42.7	0	0	99	99
Low mean		11.1	0	0	0	0
Coeff. of variation		23.1	0	0	15	15
LSD(1 Percent)		13.1	0	0	23	23
LSD(5 Percent)		9.8	0	0	17	17
No. of reps		4.0	4	4	4	4

Summary

Wild oat control with AC-222293 was better at the 2 than 4-leaf stage regardless of rate. Wild mustard control with AC-222293 was excellent at both stages of application. AC-222293 increased wheat yields compared to the untreated control 24 to 32 bu/A at the 2-leaf stage and 10 to 19 bu/A at the 4-leaf stage. Little crop injury was observed with any treatment.

Postemergence application of AC-222293 in wheat, Minot 1982. Coteau wheat was seeded April 23 in 6 inch row spacings. Herbicide applications were made to 1 1/2 to 2 leaf wheat and wild oat May 23 and 3 1/2 to 4 leaf wheat and wild oat June 3. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 18 ft. Wild oat density was 10 plants/ft square and weed control and crop injury ratings were made July 14.

Treatment	Rate oz/A	Wheat Yield bu/A	Wheat %ir	Wheat %sr	Percent Control Wioa	Percent Control Fxtl
Diclofop 2	12	38.0	0	0	88	75
AC-222293+S 2	6+.25%	38.9	0	0	86	0
AC-222293+S 2	8+.12%	41.8	0	0	98	0
AC-222293+S 2	8+.25%	41.8	0	0	94	0
AC-222293+S 2	8+.5%	38.3	0	0	91	0
AC-222293+S 2	10+.25%	40.4	0	0	95	0
AC-222293+S 2	12+.25%	43.7	0	0	98	0
Difenzoquat 4	12	28.9	5	0	65	0
AC-222293+S 4	6+.25%	29.8	1	0	58	0
AC-222293+S 4	8+.12%	33.3	0	0	68	0
AC-222293+S 4	8+.25%	31.6	0	0	65	0
AC-222293+S 4	8+.5%	31.2	4	0	61	0
AC-222293+S 4	10+.25%	31.1	3	0	71	0
AC-222293+S 4	12+.25%	32.4	3	0	79	0
Control		20.2	0	0	0	0
Mean		34.8	1	0	74	5
High mean		43.7	5	0	98	75
Low mean		20.2	0	0	0	0
Coeff. of variation		12.6	251	0	12	63
LSD(1 Percent)		8.2	5	0	17	6
LSD(5 Percent)		6.2	4	0	13	4
No. of reps		4.0	4	4	4	4

Summary

Wild oat control with AC-222293 was better at the 2 than 4 leaf stage regardless of rate. AC-222293 increased wheat yields compared to the untreated control 18 to 22 bu/A at the 2 leaf stage and 10 to 12 bu/A at the 4 leaf stage. Little crop injury was observed with any treatment.

Postemergence application of AC-222293 in wheat, Williston 1982. Len wheat was seeded May 3 in 6 inch row spacings. Herbicide applications were made to 1½ to 2-leaf wheat and wild oat May 24 and 3½ to 4-leaf wheat and wild oat June 4. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units 10 by 22 ft. Wild oat density was 5 plants/ft square and weed control and crop injury ratings made July 15.

Treatment		Rate oz/A	Wheat Yield bu/A	% IR	% SR	Percent control Wioa	Wimu	Ruth
Diclofop	2	12	36.5	0	0	87	0	0
AC-222293 + S	2	6+.25%	41.9	0	0	100	100	58
AC-222293 + S	2	8+.12%	42.2	0	0	100	100	70
AC-222293 + S	2	8+.25%	43.5	0	0	100	100	50
AC-222293 + S	2	8+.5%	43.0	0	0	100	100	84
AC-222293 + S	2	10+.25%	44.6	0	0	100	100	88
AC-222293 + S	2	12+.25%	45.2	0	0	100	100	75
Difenzoquat	4	12	33.1	0	0	79	0	18
AC-222293 + S	4	6+.25%	39.6	0	0	96	98	58
AC-222293 + S	4	8+.12%	41.8	0	0	99	98	30
AC-222293 + S	4	8+.25%	41.4	0	0	100	100	83
AC-222293 + S	4	8+.5%	40.8	0	0	99	100	40
AC-222293 + S	4	10+.25%	41.6	0	0	100	100	50
AC-222293 + S	4	12+.25%	41.2	3	0	100	100	78
Control			25.1	0	0	0	0	0
Mean			40.1	0	0	91	80	52
High mean			45.2	3	0	100	100	88
Low mean			25.1	0	0	0	0	0
Coeff. of variation			8.5	775	0	3	2	43
LSD (1 percent)			6.5	2	0	5	3	67
LSD (5 percent)			4.8	2	0	4	2	48
No. of reps			4	4	4	4	4	2

Summary

Wild oat and wild mustard control with AC-222293 was excellent at both stages of application. No crop injury was observed with any treatment. AC-222293 increased wheat yields compared to the control 17 to 20 bu/A at the 2-leaf stage and 15 to 17 bu/A at the 4-leaf stage.

AC-222293 combinations with broadleaf herbicides, Fargo 1982. Era wheat was seeded April 28 in 6 inch row spacings. Herbicide applications were made to 3 1/2 to 4-leaf wheat and wild oat May 28. Herbicides were applied with a bicycle wheel plot sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 15 plants/square ft and weed control and crop injury ratings made July 12.

Treatment	Rate oz/A	Wheat Yield bu/A	Wheat %ir	Wheat %sr	-% Control- Wioa	Wimu
AC-222293+S	6+0.25	24.0	0	0	73	95
AC-222293+MCPA+S	6+2+0.25	20.0	0	0	69	100
AC-222293+MCPA+S	6+4+0.25	20.4	0	0	70	100
AC-222293+Dicamba+S	6+1+0.25	18.3	0	0	20	100
AC-222293+Dicamba+S	6+2+0.25	20.2	0	0	43	99
AC-222293+Bromoxynil+S	6+2+0.25	20.7	0	0	51	100
AC-222293+Bromoxynil+S	6+4+0.25	16.3	0	0	26	100
AC-222293+2,4-D+S (amine)	6+2+0.25	14.1	0	0	57	98
AC-222293+2,4-D+S (amine)	6+4+0.25	20.0	0	0	68	100
AC-222293+2,4-D+S (ester)	6+2+0.25	22.2	0	0	74	100
AC-222293+2,4-D+S (ester)	6+4+0.25	23.1	0	0	71	100
AC-222293+S	12+0.25	22.0	0	0	77	98
AC-222293+MCPA+S	12+2+0.25	25.3	0	0	86	99
AC-222293+MCPA+S	12+4+0.25	15.4	0	0	61	100
AC-222293+Dicamba+S	12+1+0.25	25.4	0	0	70	98
AC-222293+Dicamba+S	12+2+0.25	19.2	0	0	36	100
AC-222293+Bromoxynil+S	12+2+0.25	22.2	0	0	58	99
AC-222293+Bromoxynil+S	12+4+0.25	17.6	0	0	49	100
AC-222293+2,4-D+S (amine)	12+2+0.25	18.2	0	0	65	100
AC-222293+2,4-D+S (amine)	12+4+0.25	20.3	0	0	75	100
AC-222293+2,4-D+S (ester)	12+2+0.25	23.4	0	0	82	100
AC-222293+2,4-D+S (ester)	12+4+0.25	24.1	0	0	78	100
Control		7.7	0	0	0	0
Mean		20.0	0	0	59	95
High mean		25.4	0	0	86	100
Low mean		7.7	0	0	0	0
Coeff. of variation		32.9	0	0	24	2
LSD(1 Percent)		12.2	0	0	26	4
LSD(5 Percent)		9.2	0	0	20	3
No. of reps		4.0	4	4	4	4

Summary

Wild mustard control with AC-222293 was excellent at 6 and 12 oz/A. Wild oat control was reduced when AC-222293 was applied in combination with bromoxynil or dicamba, but not with MCPA or the ester and amine formulation of 2,4-D.

AC-222293 combinations with broadleaf herbicides, Minot 1982. Coteau wheat was seeded April 23 in 6 inch row spacings. Herbicide applications were made to 3 1/2 to 4 leaf wheat and wild oat June 3. Herbicides were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 18 ft. Wild oat density was 15 plants/ft square and weed control and crop injury ratings were made July 14.

		--------Wheat--------			-% Control-	
Treatment	Rate oz/A	Yield bu/A	%ir	%sr	Wioa	Fxtl
AC-222293+S	6+0.25%	26.5	0	0	64	0
AC-222293+MCPA+S	6+2+0.25%	29.7	0	0	53	0
AC-222293+MCPA+S	6+4+0.25%	25.8	0	0	41	0
AC-222293+Dicamba+S	6+1+0.25%	27.3	0	0	30	0
AC-222293+Dicamba+S	6+2+0.25%	23.5	0	0	16	0
AC-222293+Bromoxynil+S	6+2+0.25%	24.8	0	0	49	0
AC-222293+Bromoxynil+S	6+4+0.25%	26.2	0	0	36	0
AC-222293+2,4-D+S (amine)	6+2+0.25%	26.0	0	0	59	0
AC-222293+2,4-D+S (amine)	6+4+0.25%	26.2	0	0	58	0
AC-222293+2,4-D+S (ester)	6+2+0.25%	33.0	0	0	61	0
AC-222293+2,4-D+S (ester)	6+4+0.25%	24.9	0	0	47	0
AC-222293+S	12+0.25%	27.5	1	0	76	0
AC-222293+MCPA+S	12+2+0.25%	27.4	0	0	63	0
AC-222293+MCPA+S	12+4+0.25%	24.5	1	0	61	0
AC-222293+Dicamba+S	12+1+0.25%	24.6	0	0	38	0
AC-222293+Dicamba+S	12+2+0.25%	22.8	0	0	41	0
AC-222293+Bromoxynil+S	12+2+0.25%	29.1	1	0	51	0
AC-222293+Bromoxynil+S	12+4+0.25%	27.1	1	0	58	0
AC-222293+2,4-D+S (amine)	12+2+0.25%	28.4	1	0	68	0
AC-222293+2,4-D+S (amine)	12+4+0.25%	36.7	0	0	70	0
AC-222293+2,4-D+S (ester)	12+2+0.25%	32.9	0	0	76	0
AC-222293+2,4-D+S (ester)	12+4+0.25%	29.7	3	0	73	0
Control		15.4	0	0	0	0
Mean		27.0	0	0	52	0
High mean		36.7	3	0	76	0
Low mean		15.4	0	0	0	0
Coeff. of variation		20.7	385	0	22	0
LSD(1 Percent)		10.3	3	0	21	0
LSD(5 Percent)		7.8	2	0	16	0
No. of reps		4.0	4	4	4	2

Summary

Wild oat control with AC-222293 was better at 12 than 6 oz/A and was influenced by broadleaf herbicide. Wild oat control was reduced when AC-222293 was applied in combination with MCPA, dicamba or bromoxynil, but not with the ester or amine of 2.4-D.

Hard red spring wheat response to AC-222,293, Fargo 1982. Ten wheat cultivars were seeded in silty clay soil pH 7.9 and 6.0% organic matter April 28. Treatments were applied with a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi to 4 to 5-leaf wheat on May 28. Precipitation for a 2 week period following application was 1.26 inch. The experiment was a randomized complete block with a split block arrangement and three replications. Experimental units were 10 by 12 ft. Injury was evaluated June 18 and plots harvested August 13.

	% Injury					Yield bu/A					
	AC-222,293 oz/A					AC-222,293 oz/A					
Cultivar	6	8	10	12	Mean	0	6	8	10	12	Mean
Era	2	2	1	5	2	47.1	51.1	53.4	50.6	47.8	50.0
Solar	0	2	3	2	2	45.3	48.4	53.0	48.5	45.7	48.2
Len	0	0	2	0	0	47.1	48.1	50.8	44.8	47.4	47.6
James	0	4	3	1	2	47.1	47.3	48.3	45.9	47.2	47.2
Waldron	2	4	4	3	3	43.3	44.2	41.1	41.3	39.2	41.8
Coteau	3	2	1	2	2	39.2	42.3	43.1	39.7	36.8	40.2
Alex	1	3	3	2	2	42.3	46.3	44.8	41.2	41.9	43.3
Butte	2	0	2	2	1	40.4	46.3	41.5	40.7	40.8	41.9
PB711	0	0	3	2	1	50.8	53.2	47.8	45.1	44.6	48.3
Oslo	0	3	2	5	2	45.4	49.0	44.9	38.9	41.2	43.9
Mean	1	2	2	2		44.8	47.6	46.9	43.7	43.2	
LSD (0.05)	TRT 4 CULT 3 TRT X CULT 10					TRT 3 CULT 8 TRT X CULT 10					

Summary

Hard red spring wheat tolerance to AC-222,293 was excellent regardless of cultivar. Visual injury to wheat did not exceed 5% for any cultivar with AC-222,293 at rates as high as 12 oz/A. Further, AC-222,293 at rates of 6 to 12 oz/A did not reduce the yield of any wheat cultivar.

Postemergence application of CGA-82725 in wheat, Fargo 1982. Era wheat was seeded April 28 in 6 inch row spacings. Herbicide applications were made to 1 1/2 to 2-leaf wheat and wild oat May 20, 3 1/2 to 4-leaf wheat and wild oat May 28 and 5 to 6-leaf wheat and wild oat June 4. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 10 plants/ft square and weed control and crop injury ratings made July 12.

		Wheat			% Control
Treatment	Rate oz/A	Yield bu/A	%ir	%sr	Wioa
Diclofop 2	12	24.4	0	0	84
CGA-82725+OC 2	1+.25G	27.9	0	0	59
CGA-82725+OC 2	2+.25G	31.8	0	0	99
Diclofop 3.5	16	30.9	0	0	76
Difenzoquat 3.5	12	25.8	0	0	86
CGA-82725+OC 3.5	1+.25G	27.9	4	0	100
CGA-82725+OC 3.5	2+.25G	22.0	9	0	100
CGA-82725+OC 3.5	4+.25G	24.6	5	0	100
Difenzoquat 5	12	16.6	0	0	56
CGA-82725+OC 5	1+.25G	14.9	13	0	98
CGA-82725+OC 5	2+.25G	15.7	14	0	100
CGA-82725+OC 5	4+.25G	15.4	13	0	100
Control		9.7	0	0	0
Mean		22.1	4	0	81
High mean		31.8	14	0	100
Low mean		9.7	0	0	0
Coeff. of variation		20.3	59	0	5
LSD(1 Percent)		8.6	5	0	8
LSD(5 Percent)		6.4	4	0	6
No. of reps		4.0	4	4	4

Summary

Wild oat control with CGA-82725 at 1 oz/A was better at the 3.5 and 5-leaf than 2-leaf stage; however at higher rates control was similar at all stages. Wheat injury with CGA-82725 increased as stage of application increased. Wheat yields generally reflected crop injury and/or wild oat control.

Postemergence application of CGA-82725 in wheat, Minot 1982. Coteau wheat was seeded April 23 in 6 inch row spacings. Herbicide applications were made to 1 1/2 to 2 leaf wheat and wild oat May 23, 3 1/2 to 4 leaf wheat and wild oat June 3 and 6 to 7 leaf wheat and wild oat June 16. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 18 ft. Wild oat density was 14 plants/ft square and weed control and crop injury ratings made July 14.

Treatment	Rate ox/A	Wheat Yield bu/A	Wheat %ir	Wheat %sr	% Control Wioa	% Control Fxtl
Diclofop 2	12	30.2	0	0	86	70
CGA-82725+OC 2	1+.25G	36.1	3	0	97	91
CGA-82725+OC 2	2+.25G	38.7	0	0	100	96
CGA-82725 2	4+.25G	31.8	1	0	88	97
Diclofop 3.5	16	19.8	0	0	73	85
Difenzoquat 3.5	12	23.4	1	0	73	0
CGA-82725+OC 3.5	1+.25G	25.7	4	0	84	79
CGA-82725+OC 3.5	2+.25G	26.8	8	0	97	94
CGA-82725+OC 3.5	4+.25G	19.4	5	0	100	97
Difenzoquat 5	12	18.2	3	0	76	0
CGA-82725+OC 5	1+.25G	17.4	31	0	97	91
CGA-82725+OC 5	2+.25G	19.8	34	0	100	97
CGA-82725+OC 5	4+.25G	11.9	48	5	100	99
Control		17.6	0	0	0	0
Mean		24.1	10	0	83	71
High mean		38.7	48	5	100	99
Low mean		11.9	0	0	0	0
Coeff. of variation		14.8	62	748	6	12
LSD(1 Percent)		6.8	12	5	9	17
LSD(5 Percent)		5.1	9	4	7	12
No. of reps		4.0	4	4	4	4

Summary

Wild oat and foxtail control with CGA-82725 was good at all rates and stages of application; however, wheat injury was greater with late than early applications. Wheat yields generally reflected crop injury and or wild oat control.

Postemergence application of CGA-82725 in wheat, Williston 1982. Len wheat was seeded May 3 in 6 inch row spacings. Herbicide applications were made to 1½ to 2-leaf wheat and wild oat May 24, 3½ to 4-leaf wheat and wild oat June 4, and 5 to 6-leaf wheat and wild oat June 16. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 22 ft. Wild oat density was 5 plants/ft square and weed control and crop injury ratings made July 15.

		Wheat			Percent control
Treatment	Rate oz/A	Yield bu/A	% IR	% SR	Wioa
Diclofop 2	12	38.5	0	0	90
CGA-82725 + OC 2	1+0.25G	37.8	0	0	84
CGA-82725 + OC 2	2+0.25G	42.5	0	0	91
CGA-82725 + OC 2	4+0.25G	35.8	3	0	99
Diclofop 3.5	16	39.3	0	0	95
Difenzoquat + 3.5	12	32.5	4	0	81
CGA-82725 + OC 3.5	1+0.25G	41.0	0	0	99
CGA-82725 + OC 3.5	2+0.25G	41.1	0	0	95
CGA-82725 + OC 3.5	4+0.25G	13.7	45	35	99
Difenzoquat + 5	12	28.9	16	0	84
CGA-82725 + OC 5	1+0.25G	23.8	18	10	100
CGA-82725 + OC 5	2+0.25G	23.7	46	3	100
CGA-82725 + OC 5	4+0.25G	20.1	56	8	100
Control		31.7	0	0	0
Mean		32.2	13	4	87
High mean		42.5	56	35	100
Low mean		13.7	0	0	0
Coeff. of variation		18.2	68	307	4
LSD (1 percent)		11.3	17	23	7
LSD (5 percent)		8.4	13	17	5
No. of reps		4	4	4	4

Summary

Wild oat control with CGA-82725 at 1 oz/A was better at the 3.5 and 5-leaf stage than 2-leaf stage; however, at higher rates control was similar at all stages. Wheat injury with CGA-82725 increased as stage of application increased. Wheat yields generally reflected crop injury and/or wild oat control.

CGA-82725 combinations with 2,4-D, Fargo 1982. Era wheat was seeded April 28 in 6 inch row spacings. Herbicide applications were made to 1 1/2 to 2-leaf wheat and wild oat May 20 and 3 1/2 to 4-leaf wheat and wild oat May 28. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 15 plants/ft square and weed control and crop injury ratings made July 12.

Treatment	Rate oz/A	Wheat Yield bu/A	Wheat %ir	Wheat %sr	% Control Wioa	% Control Wimu
CGA-82725+OC 2	2+.25G	35.7	0	0	97	0
CGA-82725+2,4-D+OC 2	2+2+.25G	39.1	0	0	97	100
CGA-82725+2,4-D+OC 2	2+4+.25G	31.8	0	0	90	99
CGA-82725+OC 2	4+.25G	26.0	0	0	98	0
CGA-82725+2,4-D 2	4+2+.25G	26.4	0	0	91	98
CGA-82725+2,4-D+OC 2	4+4+.25G	36.6	0	0	90	99
CGA-82725+OC 4	2+.25G	20.4	10	0	100	0
CGA-82725+2,4-D+OC 4	2+2+.25G	18.6	9	0	88	100
CGA-82725+2,4-D+OC 4	2+4+.25G	11.9	0	0	59	98
CGA-82725+2,4-D+OC 4	4+2+.25G	28.5	6	0	100	100
CGA-82725+2,4-D+OC 4	4+4+.25G	19.4	5	0	89	100
Control		12.1	0	0	0	0
Mean		25.5	3	0	83	66
High mean		39.1	10	0	100	100
Low mean		11.9	0	0	0	0
Coeff. of variation		17.9	104	0	9	3
LSD(1 Percent)		8.7	5	0	14	4
LSD(5 Percent)		6.5	4	0	11	3
No. of reps		4.0	4	4	4	4

Summary

Wild oat control with CGA-82725 was influenced by 2,4-D rate and stage of application. Greatest reduction in wild oat control with CGA-82725 and 2,4-D combinations occured at the 4-leaf stage. Wild oat control with CGA-82725 at 2 oz/A was reduced 41% by the addition of 4 oz/A 2,4-D.

CGA-82725 combinations with 2,4-D, Minot 1982. Coteau wheat was seeded April 23 in 6 inch row spacings. Herbicide applications were made to 1 1/2 to 2 leaf wheat and wild oat May 23 and 3 1/2 to 4 leaf wheat and wild oat June 3. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 18 ft. Wild oat density was 10 plants/ft square and weed control and crop injury ratings made July 14.

		Wheat			% Control	
Treatment	Rate oz/A	Yield bu/A	%ir	%sr	Wioa	Fxtl
CGA-82725+OC 2	2+.25G	40.8	0	0	98	94
CGA-82725+2,4-D+OC 2	2+2+.25G	25.4	0	0	41	68
CGA-82725+2,4-D+OC 2	2+4+.25G	19.9	0	0	5	70
CGA-82725+OC 2	4+.25G	37.1	3	0	99	98
CGA-82725+2,4-D 2	4+2+.25G	36.7	0	0	73	91
CGA-82725+2,4-D+OC 2	4+4+.25G	37.9	0	0	82	90
CGA-82725+OC 4	2+.25G	28.1	8	0	100	97
CGA-82725+2,4-D+OC 4	2+2+.25G	23.2	0	0	97	94
CGA-82725+2,4-D+OC 4	2+4+.25G	29.7	0	0	74	66
CGA-82725+OC 4	4+.25G	29.2	6	0	98	97
CGA-82725+2,4-D+OC 4	4+2+.25G	36.1	1	0	100	99
CGA-82725+2,4-D+OC 4	4+4+.25G	33.0	3	0	97	89
Control		20.1	0	0	0	0
Mean		30.5	2	0	74	81
High mean		40.8	8	0	100	99
Low mean		19.9	0	0	0	0
Coeff. of variation		17.7	218	0	13	10
LSD(1 Percent)		10.3	6	0	18	15
LSD(5 Percent)		7.7	5	0	14	11
No. of reps		4.0	4	4	4	4

Summary

Little wheat injury was observed with any treatment. Wild oat control with CGA-82725 was influenced by 2,4-D rate and stage of application. Greatest reduction in wild oat control with CGA-82725 and 2,4-D combinations occurred at the 2 leaf stage.

CGA-82725 additive comparison in wheat, Fargo 1982. Era wheat was seeded April 29 in 6 inch row spacings. Herbicide applications were made to 4 to 5-leaf wheat and wild oat June 1. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 10 plants/square ft and weed control and crop injury ratings made July 12.

Treatment	Rate oz/A	--------Wheat-------- %ir	%sr	% Control Wioa
CGA 82725+OC	1+.25g	3	0	92
CGA 82725+OC	2+.25g	8	0	100
CGA 82725+X-77	1+.5%	0	0	58
CGA 82725+X-77	2+.5%	6	0	91
CGA 82725+WK	1+.5%	13	0	95
CGA 82725+WK	2+.5%	7	0	96
CGA 82725+LOTM	1+.25%	0	0	60
CGA 82725+LOTM	2+.25g	0	0	80
CGA 82725+N	1+1g	0	0	13
CGA 82725+N	2+1g	0	0	44
CGA 82725+N+OC	1+1g+.25g	10	0	100
CGA 82725+N+OC	2+1g+.25g	9	0	100
Control		0	0	0
Mean		4	0	71
High mean		13	0	100
Low mean		0	0	0
Coeff. of variation		92	0	12
LSD(1 Percent)		7	0	16
LSD(5 Percent)		5	0	12
No. of reps		4	4	4

Summary

Wild oat control with CGA-82725 was influenced by additive. Wild oat control with CGA-82725 was less at 1 oz/A with the addition of X-77 or at both 1 and 2 oz/A with the addition of LOTM or liquid nitrogen compared to the addition of OC or WK.

Hard red spring wheat response to CGA-82725, Fargo 1982. Ten wheat cultivars were seeded in silty clay soil pH 7.9 and 6.0% organic matter April 28. Treatments were applied with a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi to 4 to 5-leaf wheat on May 28. Precipitation for a 2 week period following application was 1.26 inch. The experiment was a randomized complete block with a split block arrangement and three replications. Experimental units were 10 by 12 ft. Injury was evaluated June 18 and plots harvested August 13.

	% Injury			Yield bu/A			
	CGA-82725 oz/A			CGA-82725 oz/A			
Cultivar	2	4	Mean	0	2	4	Mean
Era	2	8	5	47.1	47.3	43.4	45.9
Solar	3	12	8	45.3	47.9	43.4	45.5
Len	3	39	21	47.1	45.4	35.2	42.6
James	7	32	20	47.1	43.5	35.4	42.0
Waldron	3	20	12	43.3	35.9	32.4	37.2
Coteau	9	53	31	39.2	35.5	20.5	31.7
Alex	6	22	14	42.3	39.0	36.0	39.1
Butte	5	52	29	40.4	39.3	27.4	35.7
PB711	4	13	9	50.8	47.4	41.9	46.7
Oslo	2	12	7	45.4	41.7	43.1	43.4
Mean	4	24		44.8	42.3	35.9	
LSD (0.05	TRT 4 CULT 3			TRT 3 CULT 8			
	TRT X CULT 10			TRT X CULT 10			

Summary

Wheat injury increased from 4 to 24% as CGA-82725 rate increased from 2 to 4 oz/A. Wheat cultivar injury ranged from 8 to 53% with 4 oz/A. Further yield reductions with 4 oz/A ranged from 4 to 48%. Era, Solar, ProBrand 711 and Oslo were generally the most resistant while Coteau and Butte were the most susceptible cultivars to CGA-82725.

Chlorsulfuron combinations with wild oat herbicides in wheat, Fargo 1982. Era wheat was seeded April 28 in 6 inch row spacings. Herbicide applications were made to 1 1/2 to 2-leaf wheat and wild oat May 20 and 3 1/2 to 4-leaf wheat and wild oat May 26. Treatments were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi except barban was applied in 4.5 gpa at 45 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Wild oat density was 15 plants/square ft and weed control and crop injury ratings made July 12.

Treatment	Rate oz/A	----Wheat---- %ir	%ir	--% Control-- Wioa	Wimu
Barban+S 2	6+0.25%	0	0	34	0
Barban+Chlorsulfuron+S 2	6+0.12+0.25%	0	0	30	100
Barban+Chlorsulfuron+S 2	6+0.25+0.25%	0	0	23	100
Barban+Chlorsulfuron+S 2	6+0.37+0.25%	0	0	20	100
Barban+Chlorsulfuron+S 2	6+0.5+0.25%	0	0	20	100
Barban+DPX-T6376+S 2	6+0.25+0.25%	0	0	33	100
Diclofop+S 2	12+0.25%	0	0	68	0
Dicl+Chlorsulfuron+S 2	12+0.12+0.25%	0	0	58	100
Dicl+Chlorsulfuron+S 2	12+0.25+0.25%	0	0	53	100
Dicl+Chlorsulfuron+S 2	12+0.37+0.25%	0	0	41	100
Dicl+Chlorsulfuron+S 2	12+0.5+0.25%	0	0	35	100
Diclofop+DPX-T6376+S 2	12+0.25+0.25%	0	0	66	100
Difenzoquat 4	12	0	0	55	30
Difenzoquat+Chlorsulfuron 4	12+0.12	0	0	56	100
Difenzoquat+Chlorsulfuron 4	12+0.25	0	0	45	100
Difenzoquat+Chlorsulfuron 4	12+0.37	0	0	54	100
Difenzoquat+Chlorsulfuron 4	12+0.5	0	0	48	100
Difenzoquat+DPX-T6376 4	12+0.25	0	0	41	100
AC222293+2 4	6+0.25%	0	0	71	88
AC222293+2 4	12+0.25%	0	0	75	85
AC222293+Chlorsulfuron+S 4	6+.12+.25%	0	0	76	100
AC222293+Chlorsulfuron+S 4	6+.25+.25%	0	0	56	100
AC222293+DPX-T6376 4	6+0.25+0.25%	0	0	74	100
AC222293+Clsu 4	12+0.12+0.25%	0	0	66	95
AC222293+Clsu 4	12+0.25+0.25%	0	0	81	100
AC222293+DPX-T6376	12+0.25+0.25%	0	0	75	100
Control		0	0	0	0
Mean		0	0	50	85
High mean		0	0	81	100
Low mean		0	0	0	0
Coeff. of variation		0	0	21	11
LSD(1 Percent)		0	0	19	17
LSD(5 Percent)		0	0	14	13
No. of reps		4	4	4	4

Summary

Wild oat control with barban or diclofop was reduced by the addition of chlorsulfuron at rates of 0.37 and 0.5 oz/A. Wild oat control with difenzoquat or AC-222293 generally was not influenced by chlorsulfuron.

Vic durum wheat response to herbicides, Fargo 1982. Vic durum was seeded April 28 in 5 inch row spacings. SSH-0860 was applied preemergence and harrow incorporated twice (PEI) or left undisturbed on the surface (PE) April 29. Postemergence treatments were applied to 2-leaf wheat on May 20 or 4-leaf wheat May 28. Treatments were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi except SSH-0860 was in 17 gpa. The experiment was a randomized complete block with 3 replications and experimental units 10 by 12 ft. Injury was evaluated June 18 and plots harvested August 13.

Treatment	Stage	Rate lb/A	INJ %	Yield bu/A
SSH-0860	PEI	3	3	40.7
SSH-0860	PE	3	3	36.7
Propanil	2-L	1.5	2	36.5
Prnl + MCPA	2-L	1.1+0.25	8	36.6
AC-222,293	4-L	0.37	2	44.4
AC-222,293	4-L	0.5	0	38.5
AC-222,293	4-L	0.62	3	41.4
AC-222,293	4-L	0.75	8	37.7
CGA-82725	4-L	0.12	3	37.5
CGA-82725	4-L	0.25	12	40.4
Difenzoquat	4-L	1	65	32.7
Control	---	------	0	44.0
	LSD (0.05)		10	10.0

Summary

Difenzoquat at 1 lb/A reduced Vic yield over 25% in 1982. Little injury was observed with the other treatments.

Competition of selected wild oat lines in wheat, Fargo 1982. Wild oat selections were seeded in a 4 by 4 ft area April 30 (720 seeds/plot) and Era wheat seeded in 6 inch row spacings May 20 to compare the competitive ability of wild oat selections in wheat.

	Wild oat		Wheat		
	Height	Panicles	Yield		%
Line	(cm)	(No.)	(g)	(bu/A)	reduction
7	75	64	167	16.7	37
26	105	86	134	13.4	49
43	60	49	188	18.8	29
64	97	59	175	17.5	34
69	110	72	145	14.5	45
77	86	56	149	14.9	44
127	93	55	134	13.4	49
149	100	101	170	17.0	36
213	91	70	116	11.6	56
220	85	45	141	14.1	47
229	83	49	127	12.7	52
None	---	---	265	26.5	0
LSD(0.05)	20	30	70	6.2	26

SUMMARY

Era wheat yield was reduced 29 to 56% by competition with the various lines. Wild oat lines had emerged when wheat was seeded which probably accentuated yield reductions. Wild oat line 213 was the most competitive and line 26 the least competitive with Era wheat. Wheat yield reductions from the various wild oat lines were not closely related to plant height or panicle number.

Preplant wild oat control in flax, Fargo 1982. Treatments were applied to silty clay soil pH 7.9 and 6.0% organic matter with a bicycle wheel sprayer delivering 17 gpa at 35 psi, incorporated twice with a field cultivator and Culbert flax seeded May 3. Precipitation for a 2 week period following application totaled 1.99 inch. MCPA dimethylamine was applied June 10 to 3 to 4 inch flax. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 ft. Weed control and flax injury rating were on June 18 and flax injury evaluated a second time on July 23. Wild oat and foxtail densities were 5 plants/ft.

		-----Flax-----			--Percent Control--				--Flax--	
Treatment	Rate lb/A	Yield bu/A	%ir	%sr	Wioa	Wimu	Fxtl	Kocz	%ir --July--	%sr
Triallate+MCPA	1.5+.25	14.2	11	1	98	95	0	90	0	0
Diallate+MCPA	1.5+.25	14.4	9	1	97	93	0	90	0	0
EPTC+MCPA	2+.25	16.3	9	4	87	91	90	95	0	3
EPTC+MCPA	3+.25	15.8	14	4	92	96	97	90	0	3
EPTC&R-33865+MCPA	2+.25	15.9	16	15	95	94	96	90	3	6
EPTC&R-33865+MCPA	3+.25	17.8	19	9	94	95	98	90	0	0
Diallate+Metolachlor+MCPA	1.5+2+.25	19.0	11	15	97	94	97	90	0	4
Diallate+EPTC+MCPA	1.5+2+.25	20.6	8	15	98	94	98	90	0	4
Dial+Trifluralin+MCPA	1.5+1+.25	16.8	14	58	95	93	98	100	10	34
EPTC+Metolachlor+MCPA	2+2+.25	18.5	11	14	94	97	98	95	0	8
EPTC+Trifluralin+MCPA	2+1+.25	15.9	13	64	94	94	98	100	10	38
Control		7.4	8	0	0	0	0	0	0	0
Mean		16.0	12	17	87	86	72	85	2	8
High mean		20.6	19	64	98	97	98	100	10	38
Low mean		7.4	8	0	0	0	0	0	0	0
Coeff. of variation		20.9	73	50	3	3	4	0	77	95
LSD(1 Percent)		6.4	16	16	5	4	5	0	3	15
LSD(5 Percent)		4.8	12	12	4	3	4	0	2	11
No. of reps		4.0	4	4	4	4	4	1	4	4

Summary

Flax stand was reduced over 30% (July 23) by trifluralin combinations with diallate or EPTC. WIld oat control was good with all treatments and yellow foxtail control was good with all treatments except diallate or triallate. Herbicide treatments increased flax yields 6.8 to 13.2 bu/A compared to the untreated control and generally reflected weed control and/or crop injury with the various treatments.

Postemergence wild oat control in flax, Fargo 1982. Culbert flax was seeded in 6 inch row spacings in silty clay soil pH 7.9 and 6.4% organic matter May 3. Treatments were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi on June 2 to 2 to 3 inch flax and 2 to 4 leaf wild oat and yellow foxtail. Precipitation for a 2 week period following application totaled 1.25 inch. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 24 feet. Flax injury ratings were on June 18 and July 4. Wild oat and foxtail densities were 5 plants/sq ft.

Treatment	Rate oz/A	-June 18- ---Flax-- %ir	%sr	----------July 24---------- Percent Control Wioa	Wimu	Fxtl	---Flax-- %ir	%sr
Diclofop	12	3	0	78	0	90	0	0
Diclofop+Bromoxynil	12+4	5	0	81	74	95	0	0
Diclofop+Chlorsulfuron+S	12+.125+.5%	5	0	69	100	85	2	0
BAS-9052+OC	2+.25G	0	0	99	23	98	0	0
BAS-9052+OC	4+.25G	5	0	100	0	100	0	0
BAS-9052+MCPA+OC	4+4+.25G	13	0	100	97	100	0	0
BAS-9052+Bromoxynil+OC	4+4+.25G	4	0	100	75	99	0	0
BAS-9052+Chlorsulfuron+OC	4+.125+.25G	16	0	100	99	100	3	0
CGA-82725+OC	2+.25G	6	0	98	0	100	0	0
CGA-82725+OC	4+.25G	3	0	100	0	100	3	0
CGA-82725+MCPA+OC	4+4+.25G	11	0	97	95	99	0	0
CGA-82725+Bromoxynil+OC	4+4+.25G	9	0	100	84	100	0	0
CGA-82725+Clsu+OC	4+.125+.25G	15	0	100	98	100	3	0
PP-009+OC	2+.25G	5	0	44	0	79	0	0
PP-009+OC	4+.25G	4	0	93	0	98	0	0
PP-009+MCPA+OC	4+4+.25G	5	0	41	92	47	0	0
PP-009+Bromoxynil+OC	4+4+.25G	10	0	95	75	98	1	0
PP-009+Chlorsulfuron+OC	4+.125+.25G	17	0	85	100	97	0	0
Asulam+S	12+.25%	1	0	49	76	76	0	0
Asulam+MCPA+S	12+4+.25%	14	0	45	94	75	3	0
Asulam+Bromoxynil+S	12+4+.25%	14	0	63	95	88	8	0
Asulam+Chlorsulfuron+S	12+.125+.25%	9	0	46	93	83	4	0
Control		0	0	0	0	0	0	0
Mean		8	0	77	60	87	1	0
High mean		17	0	100	100	100	8	0
Low mean		0	0	0	0	0	0	0
Coeff. of variation		75	0	15	19	8	215	0
LSD(1 Percent)		10	0	22	21	13	4	0
LSD(5 Percent)		8	0	16	16	10	3	0
No. of reps		4	4	4	4	4	4	4

Summary

Grass weed control was excellent with BAS-9052 and CGA-82725 at 2 and 4 oz/A and was not influenced by broadleaf herbicide. Grass weed control with PP-009 was better at 4 than 2 oz/A and was reduced when applied in combination with MCPA. Grass weed control with diclofop was fair and was not influenced by bromoxynil or chlorsulfuron. Wild oat control was poor and yellow foxtail control fair with asulam alone or in combination with broadleaf herbicides. Only slight flax injury was observed with several treatments (July 24).

CGA-82725 and additives for control of two leaf wild oats, Fargo 1982. Era wheat was seeded April 26. Treatments were applied to 1 to 1.5 leaf wheat and 1.5 to 2 leaf wild oats on May 21. Harvest was on August 9. The LOTM was a sample which was several years old and did not emulsify properly.

Treatment	Rate oz/A	Wheat Yield Bu/A	Wheat %ir 6/8	Wheat %sr 6/8	%Control Wioa 6/8	%Control Wioa 6/22
CGA-82725	2	13.5	0	0	13	13
CGA-82725+SOTM	2+.25g	35.2	0	0	72	95
CGA-82725+LOTM	2+.25g	23.0	0	0	48	67
CGA-82725+OC	2+.25g	39.1	0	0	75	98
CGA-82725+S	2+.05%	40.0	0	0	70	92
CGA-82725	4	21.0	0	0	52	63
CGA-82725+SOTM	4+.25g	41.2	2	0	75	98
CGA-82725+LOTM	4+.25g	31.7	0	10	70	94
CGA-82725+OC	4+.25g	39.3	12	0	88	97
CGA-82725+S	4+.05%	37.7	7	3	75	98
CGA-82725	8	35.9	0	0	70	91
CGA-82725+SOTM	8+.25g	36.0	13	10	83	99
CGA-82725+LOTM	8+.25g	35.0	10	12	77	100
CGA-82725+OC	8+.25g	20.4	23	37	90	99
CGA-82725+S	8+.05%	38.2	13	0	82	99
Control		8.8	0	0	0	0
Mean		31.0	5	4	65	81
High mean		41.2	23	37	90	100
Low mean		8.8	0	0	0	0
Coeff. of variation		16.8	48	180	12	10
LSD(1 Percent)		11.7	5	18	17	19
LSD(5 Percent)		8.7	4	13	13	14
No. of reps		3.0	3	3	3	3

Summary

The linseed oil LOTM which did not completely emulsify was less effective in enhancing CGA-82725 than the other additives. Surfactant X-77 at 0.25% was similar as an additive in enhancing wild oat control as the additive at 1 qt/A. Soybean oil (SOTM) was similar to the petroleum oil in enhancing wild oat control with CGA-82725 at the June 22 evaluation. SOTM with CGA-82725 at 8 oz/A was less injurious to wheat than CGA-82725 with petroleum oil (OC). SOTM only at the early evaluation and at the 4 oz/A rate of CGA-82725 tended to cause less wild oat control than the OC additive.

CGA-82725 and additives for control of five leaf wild oats, Fargo (NW22) 1982. Era wheat was seeded on April 29. The treatments were applied when both wheat and wild oat were in the five leaf stage on June 3. Harvest was on August 9.

Treatment	Rate oz/A	Wheat Yield Bu/A	Wheat %ir	Wheat %sr	% Control Wioa 6/14	% Control Wioa 7/2
CGA-82725	2	13.0	0	0	13	40
CGA-82725+SOTM	2+.25g	20.1	3	0	47	96
CGA-82725+LOTM	2+.25g	18.5	2	0	43	86
CGA-82725+OC	2+.25g	23.9	2	0	55	100
CGA-82725+S	2+.05%	20.9	5	0	43	93
CGA-82725	4	15.4	0	0	22	73
CGA-82725+SOTM	4+.25g	18.4	5	10	68	100
CGA-82725+LOTM	4+.25g	18.4	7	8	60	99
CGA-82725+OC	4+.25g	19.6	10	0	83	100
CGA-82725+S	4+.05%	15.2	8	8	63	99
CGA-82725	8	19.2	5	0	30	94
CGA-82725+SOTM	8+.25g	23.9	10	0	78	100
CGA-82725+LOTM	8+.25g	23.7	8	5	67	100
CGA-82725+OC	8+.25g	10.3	25	60	93	100
CGA-82725+S	8+.05%	11.7	13	33	72	100
Control		13.1	0	0	0	0
Mean		17.9	6	8	52	86
High mean		23.9	25	60	93	100
Low mean		10.3	0	0	0	0
Coeff. of variation		21.1	48	101	18	8
LSD(1 Percent)		8.4	7	18	22	16
LSD(5 Percent)		6.3	5	13	16	12
No. of reps		3.0	3	3	3	3

Summary

All additives, soybean oil (SOTM), linseed oil (LOTM), petroleum (OC), and surfactant X-77 simularly enhanced CGA-82725 for wild oats control, at the late evaluation. The petroleum oil with 16% emulsifier caused CGA-82725 to injure wheat more than the other additives.

Depth of trifluralin incorporations and wheat seeding, Absaraka 1981-82. Fall treatments were applied and tandem disk incorporated once (F3I) or twice (FGI) on October 30, 1981 under misty conditions. The plot area was field cultivated, treatment applied and twice field cultivator with harrow incorporated 3 to 4 in (3 PPI) or 1 to 2 in(1.5 PPI) on May 5. Era wheat was seeded 1 to 1.5 in deep to the front 12 ft and 1/2 to 3/4 in to the back 12 ft of each plot and SSH-0860 applied, May 21. Proponil+Diclofop was applied to 2 lf wheat and less than 1 in foxtail on June 10 and MCPA aplied to the entire area, June 22.

Treatment	Rate lb/A	--Yield-- Deep g/48	Shal sqft	------Wheat------- --Deep-- %ir	%sr	-Shallow %ir	%sr	% Control Yeft	Colq	Wht Spike Deep -3 ft	Shal sq-
Trifluralin Fall Surface	.5	1163	1298	0	0	0	0	50	53	81	88
Trifluralin Fall Surface	1	1222	1197	0	0	0	0	54	54	91	105
Trifluralin Fall Surface	1.5	1227	1206	1	9	0	0	95	94	99	104
Trifluralin (F3I)	.5	1106	1147	0	9	0	6	89	96	95	100
Trifluralin (F3I)	1	987	1172	3	34	0	4	96	97	89	100
Trifluralin (F3I)	1.5	1036	925	3	34	15	30	97	99	78	86
Trifluralin (F6I)	.5	1018	1180	0	4	0	0	74	81	88	96
Trifluralin (F6I)	1	1106	1263	3	11	0	3	93	90	89	105
Trifluralin (F6I)	1.5	1064	1172	0	26	0	19	97	94	87	104
Pendimethalin (F3I)	.5	922	1020	0	0	0	0	33	33	77	85
Pendimethalin (F3I)	1	1006	1319	0	8	0	3	83	85	95	98
Pendimethalin (F3I)	1.5	973	1156	8	13	6	13	88	91	79	96
UBI-S734-G FG3I	1	752	802	5	23	8	31	94	43	87	100
UBI-S734-G FG3I	2	550	571	8	46	15	51	99	28	76	85
SSH-0860 F3I	1.5	1047	1233	1	1	1	0	86	98	91	97
SSH-0860 F3I	2	956	980	1	4	0	0	89	89	89	90
Trifluralin S 1.5 PPI	.5	901	1162	0	24	0	16	95	93	70	88
Trifluralin S 3 PPI	.5	1032	1020	0	14	0	18	95	74	85	96
Pendimethalin S 1.5 PPI	1	866	924	0	15	0	20	98	91	83	85
Pendimethalin S 3 PPI	1	898	883	3	23	0	24	99	98	85	94
UBI-S734-G S 3 PPI	1.5	604	579	11	44	19	54	97	34	64	69
SSH-0860 S	1.5	878	985	6	3	5	3	97	100	92	94
Propanil+Diclofop Control	3+1	819	971	1	3	1	0	100	98	84	94
Control weedy		1111	1084	0	1	0	3	23	24	91	97
Mean		968	1052	2	14	3	12	84	76	85	94
High mean		1227	1319	11	46	19	54	100	100	99	105
Low mean		550	571	0	0	0	0	23	24	64	69
Coeff. of variation		18	20	237	74	210	85	18	31	15	15
LSD(1 Percent)		320	396	10	20	11	19	28	44	23	27
LSD(5 Percent)		242	299	7	15	9	15	21	33	18	20
No. of reps		4	4	4	4	4	4	4	4	4	4

Summary

Trifluralin fall applied tended to cause less injury to wheat which was shallow than deep seeded based upon yield and stand reductions. Trifluralin at 1 bl/A gave less foxtail control when fall surface applied than when incorporated. The results of fall treatments were variable possibly from the ridging caused by the disk used for herbicide incorporation in the wet soil.

Preemergence foxtail control in wheat, Fargo 1982. Preplant once harrow incorporated (PPIH) treatments were applied, Era wheat seeded, and preemergence twice harrow incorporated (PEI) treatment applied on May 7, and surface preemergence (PE) treatment on May 8. Percent weed control, wheat injury, and stand reduction were evaluated on June 15 and harvest was on August 18. Yellow foxtail density was 100/sq ft and other weeds less than 1 plant/sq yd.

		-------Wheat-------			-Percent Control-		
Treatment	oz/A	Yield bu/A	%ir	%sr	Fxtl	Wimu	Kocz
Trifluralin PPIH	12	26.3	0	59	99	0	99
CGA-82725 PPIH	8	21.0	0	3	85	0	25
Trifluralin+Chlorsulfuron PPIH	12+.25	28.9	0	65	100	100	100
Chlorsulfuron PPIH	.25	32.6	0	3	98	100	100
CGA-82725 PEI	8	28.0	0	0	84	0	25
Trifluralin PEI	12	32.3	0	14	99	0	95
Pendimethalin PEI	16	35.0	0	11	96	50	86
Trifluralin+Triallate PEI	12+16	23.1	0	16	98	0	82
Trifluralin+Chlorsulfuron PEI	12+.25	34.0	5	13	100	100	100
Trif+Tria+Chlorsulfuron PEI	12+16+.25	33.1	1	20	100	100	100
DPX-T6376 PEI	.25	32.9	31	4	99	100	100
Chlorsulfuron PEI	.25	36.1	5	3	98	100	100
Chlorsulfuron PE	.125	31.4	0	0	75	100	94
Chlorsulfuron PE	.25	31.6	0	2	94	100	100
Chlorsulfuron PE	.375	33.1	0	0	98	100	100
DPX-T6376 PE	.125	33.4	5	2	99	100	100
DPX-T6376 PE	.25	27.9	8	2	100	100	100
DPX-T6376 PE	.375	25.0	25	7	100	100	100
CGA-82725 PE	4	26.5	0	0	0	0	0
CGA-82725 PE	8	26.5	0	0	73	0	0
CGA-82725+Chlorsulfuron PE	4+.25	34.7	0	3	99	100	100
Propachlor+Chlorsulfuron PE	48+.25	31.7	4	1	100	100	100
Pendimethalin PE	16	27.5	0	3	80	30	87
Pend+Dica-CN-10-4359 PE	16+2	29.9	0	0	78	100	96
Control		24.5	0	0	21	98	25
Mean		29.9	3	9	87	67	81
High mean		36.1	31	65	100	100	100
Low mean		21.0	0	0	0	0	0
Coeff. of variation		19.0	144	66	13	0	23
LSD(1 Percent)		10.5	9	11	21	0	34
LSD(5 Percent)		7.9	7	8	16	0	26
No. of reps		4.0	4	4	4	1	4

Summary

Wheat yields generally related to weed control and crop injury and stand reduction. Yields were quite variable because of variation in weed density. Trifluralin applied preplant and shallow incorporated caused severe wheat stand reductions, but wheat yield exceeded that of untreated wheat. Treatments which contained chlorsulfuron controlled both grass and broadleaf weeds. The soil was very dry at treatment which was followed by more than a week of rain all which may have enhanced injury to the wheat.

Broadleaf weed control in wheat, Fargo 1982. 'Era' hard red spring wheat was seeded on April 8 and herbicides applied to 3 to 5 leaf wheat and 2 to 5 inch wild mustard and kochia on June 11. Soil moisture was excellent at treatment. Weed control evaluation was on June 27 and harvest on August 14.

Treatment	oz/A	Wheat Yield bu/A	Wheat %ir	Wheat %sr	Percent Control- Wimu	Kocz	Colq
Dicamba	1	36.4	1	0	78	95	99
Dicamba	2	34.2	8	0	91	93	98
Dicamba-2	2	35.0	9	0	84	95	100
Dicamba-CN 10-4359	2	31.4	4	0	68	75	93
Dicamba+MCPA	1+4	38.6	1	0	99	99	100
Dicamba+MCPA	2+4	38.7	8	0	100	100	100
Dicamba+2,4-D	1+4	38.8	6	0	99	100	100
Dicamba+Bromoxynil	1+2	38.7	3	0	93	99	100
Dicamba+Chlorsulfuron	1+.167	43.1	0	0	100	99	100
Chlorsulfuron+S	.083+.125%	42.0	1	0	100	99	100
Chlorsulfuron+S	.167+.125%	42.1	3	0	99	100	100
Chlorsulfuron+S	.25+.125%	39.9	0	0	99	100	100
DPX-T6376+S	.167+.125%	38.8	11	0	100	100	100
DPX-T6376+S	.25+.125%	36.2	15	0	100	100	100
Dinoseb-5EC	40	36.9	19	0	100	99	100
Dinoseb-3	24	34.3	3	0	93	75	93
2,4-D DEA & 2,4-D DMA (aeromine)	4	37.9	4	0	97	95	100
2,4-DSULV	3.8	40.5	1	0	97	98	100
2,4-D DMA	4	38.4	1	0	97	95	100
MCPA DMA	4	40.8	0	0	96	93	100
Dica & MCPP & MCPA (4E)	4	35.7	6	0	95	94	100
Dica & MCPP & MCPA (4E)	8	37.0	7	0	99	100	100
2,4-D DEA & 2,4-D DMA (aeromine	8	37.2	3	0	99	98	100
Bromoxynil	3	41.0	1	0	83	80	95
Bromoxynil	6	39.4	1	0	94	94	100
Bromoxynil+Chlorsulfuron	3+.083	39.4	0	0	100	100	100
Bromoxynil+Chlorsulfuron	6+.083	48.4	1	0	100	100	100
Bromoxynil+Chlorsulfuron	3+.167	39.0	3	0	100	100	100
Bromoxynil+MCPA+Clsu	2+2+.083	40.3	0	0	100	100	100
Bromoxynil+MCPA+Clsu	4+4+.083	41.2	0	0	100	100	100
Bromoxynil+MCPA+Clsu	4+4+.167	40.0	3	0	100	100	100
Bromoxynil+MCPA	2+2	36.4	0	0	95	85	100
Bromoxynil+MCPA	4+4	40.9	0	0	99	100	100
Control		27.8	0	0	0	0	0
Mean		38.4	4	0	93	93	96
High mean		48.4	19	0	100	100	100
Low mean		27.8	0	0	0	0	0
Coeff. of variation		11.2	95	0	5	6	3
LSD(1 Percent)		8.0	6	0	8	10	5
LSD(5 Percent)		6.0	5	0	6	8	4
No. of reps		4.0	4	4	4	4	4

Summary

Wheat stand was not reduced by any of the herbicides. All treatments gave 75% or more control of all broadleaf weeds. Wild mustard was a 5, kochia and common lambsquarters at less than 1 plant/sq yd. Wheat grain yield was increased by all treatments compared to that of untreated (control) wheat.

Bromoxynil formulation in wheat, Fargo NW22 1982. Era wheat was seeded on April 28. Treatments were applied to 4 leaf wheat, 1 inch rosette kochia, and 4 leaf wild mustard, June 4. The 6E formulation appeared to have some material adhering to the bottom of the plastic spray bottles. Evaluations were on June 18 and harvest on August 14. The experiment was a split plot with formulation at the main plots and rates at the sub-plots with four replications.

Herbicide and formulation		Rate(Brox,Brox+MCPA), oz/A 2,2+2	4,4+4	6,6+6	Average
		Wheat Injury, Percent			
Bromoxynil	4E	0	0	2	0.8
Bromoxynil	2E	0	1	4	1.7
Bromoxynil+MCPA	6E	0	1	0	0.4
Bromoxynil+MCPA	4E	0	0	0	0.0
None		0	0	0	0.0
Average		0.0	0.5	1.2	

LSD average over herbicide = NS
LSD average over rate = NS
LSD rate x herbicide = NS

		Wild mustard control, Percent			
Bromoxynil	4E	72	90	98	87
Bromoxynil	2E	77	93	96	89
Bromoxynil+MCPA	6E	93	98	99	96
Bromoxynil+MCPA	4E	90	98	98	95
None		0	0	0	0
Average		66	76	78	

LSD average over herbicide = 4
LSD average over rate = 3
LSD rate x herbicide = 7

		Volunteer Sunflower control, Percent			
Bromoxynil	4E	64	95	100	86
Bromoxynil	2E	76	96	100	91
Bromoxynil+MCPA	6E	62	98	99	86
Bromoxynil+MCPA	4E	81	91	94	88
None		0	0	0	0
Average		57	76	78	

LSD average over herbicide = 9
LSD average over rate = 6
LSD rate x herbicide = 15

		Kochia control, Percent			
Bromoxynil	4E	45	96	99	80
Bromoxynil	2E	68	97	100	88
Bromoxynil+MCPA	6E	64	95	96	85
Bromoxynil+MCPA	4E	61	88	89	79
None		0	0	0	0
Average		48	75	77	

LSD average over herbicide = 7
LSD average over rate = 7
LSD rate x herbicide = 12

Bromoxynil formulation continued

		Wheat yield, bu/A			
Bromoxynil	4E	33.0	38.1	36.5	35.9
Bromoxynil	2E	34.5	38.3	35.7	36.1
Bromoxynil+MCPA	6E	36.7	32.6	34.0	34.4
Bromoxynil+MCPA	4E	34.3	31.8	36.2	34.1
None		23.0	24.5	28.7	25.4
Average		32.3	33.0	34.2	

LSD average over herbicide = NS
LSD average over rate = 3.0
LSD rate x herbicide = NS

Summary

The various formulations were of Bromoxynil and Bromoxynil Plus. None of the treatments carried any stand reduction. Weed control from bromoxynil with MCPA was not influenced by formulation. Volunteer sunflower and kochia control tended to be better with the bromoxynil 4E than the 2E formulation. The herbicide treatments generally increased wheat yield 10 bu/A and increases were similar for all formulations. Wheat yield tended to increase as herbicide rate increased.

MCPA formulations for weed control in wheat, Fargo, NW 22, 1982. Era wheat was seeded on April 28. Treatments were applied to three to five leaf wheat, mostly five leaf, three to seven leaf wild mustard and 2 to 3 inch kochia on June 11. Evaluation for weed control and crop injury was on June 23 and harvest on August 11.

		Wheat					
					Percent Control		
Treatment	Rate oz/A	Yield Bu/A	%ir	%sr	Wimu	Colq	Wibw
MCPA DMA	4	32.3	0	0	95	98	23
MCPA DMA	8	28.3	0	0	97	100	31
MCPA-NA2	4	29.1	0	0	88	94	3
MCPA-NA2	8	27.6	0	0	97	100	25
MCPA-(Vacate)	4	25.3	0	0	92	97	4
MCPA-(Vacate)	8	27.2	0	0	97	99	26
Control		22.8	0	0	0	0	0
Mean		27.5	0	0	81	84	16
High mean		32.3	0	0	97	100	31
Low mean		22.8	0	0	0	0	0
Coeff. of variation		14.6	0	0	4	2	67
LSD(1 Percent)		8.2	0	0	7	4	22
LSD(5 Percent)		6.0	0	0	5	3	16
No. of reps		4.0	4	4	4	4	4

Summary

MCPA formulations did not influence weed control or wheat injury or grain yield. Wheat grain yield was generally higher with all herbicide treatments than when not treated.

Postemergence foxtail control in wheat, Fargo 1982. 'Era' wheat was seeded on May 7. Herbicides were applied to three leaf wheat and yellow foxtail, 2 inch wild mustard, and 1 inch kochia on June 1. Yellow foxtail was 50, wild mustard and kochia 2, and common lambsquarters less than 1 plant/sq ft. Weed control and crop injury (IR) were evaluated on June 15 and harvest was on August 18.

		------Wheat------			---Percent Control---			
Treatment	oz/A	Yield bu/A	%ir	%sr	Fxtl	Wimu	Kocz	Colq
Propanil	18	19.5	3	0	88	86	91	100
Propanil	24	28.3	8	0	98	91	96	100
Propanil+MCPA ester	18+4	29.0	4	0	87	99	96	100
Propanil+Chlorsulfuron	18+.125	31.8	6	0	100	100	100	100
Propanil+Chlorsulfuron	18+.25	30.7	4	0	90	100	100	100
Pendimethalin+Chlorsulfuron	12+.125	35.4	0	0	94	100	100	100
Pendimethalin+Propanil	12+12	27.7	1	0	94	90	94	100
Pendimethalin+Propanil	12+18	25.1	1	0	95	86	96	100
Pendimethalin+Propanil	16+12	31.3	4	0	90	89	93	95
Pendimethalin+Propanil	16+18	27.7	6	0	96	89	96	100
Propanil+Bromoxynil	18+2	28.3	5	0	93	100	100	100
Propanil+Bromoxynil+MCPA	18+2+2	26.5	4	0	94	98	98	100
Propanil+Bromoxynil	18+4	33.6	10	0	99	100	100	100
Propanil+Bromoxynil+MCPA	18+4+4	28.2	4	0	88	99	100	100
Propanil+Bromoxynil	24+8	27.6	13	0	97	100	100	100
Propanil+Bromoxynil+MCPA	24+8+8	26.7	23	0	100	100	100	100
Bromoxynil	4	27.6	0	0	21	99	98	100
Bromoxynil	8	23.8	0	0	24	99	100	100
Bromoxynil+MCPA	4+4	26.3	0	0	10	100	100	100
Bromoxynil+MCPA	8+8	33.4	3	0	64	96	98	100
CGA-82725+OC	3+.25G	17.6	5	0	99	0	0	0
CGA-82725+MCPA+OC	3+4+.25G	27.9	3	0	87	87	56	100
CGA-82725+Bromoxynil+OC	3+4+.25G	32.1	4	0	98	94	99	100
AC-222293+S	8+.25%	28.5	0	0	39	98	49	0
Diclofop	12	16.5	0	0	96	0	0	0
Diclofop+Bromoxynil	12+4	32.6	3	0	96	91	98	100
Chlorsulfuron+S	.125+.25%	27.2	1	0	90	100	99	100
Chlorsulfuron+S	.25+.25%	29.7	1	0	98	100	100	100
DPX-T6376+S	.125+.25%	30.0	26	0	94	100	100	100
DPX-T6376+S	.25+.25%	31.1	35	0	100	100	100	100
Control		13.5	0	0	0	0	0	0
Mean		27.6	6	0	81	87	86	87
High mean		35.4	35	0	100	100	100	100
Low mean		13.5	0	0	0	0	0	0
Coeff. of variation		22.9	83	0	11	7	9	0
LSD(1 Percent)		11.7	9	0	16	11	15	0
LSD(5 Percent)		8.8	7	0	12	8	11	0
No. of reps		4.0	4	4	4	4	4	1

Summary

None of the herbicides caused any wheat stand reduction. Yields generally related to weed control and wheat injury. Nearly all weed control treatments which controlled both grass and broadleaf weed increased wheat yield more than twice that of untreated wheat.

MK herbicides for broadleaf and grass weed control, Fargo 1982. Era wheat seed- and PEI treatments applied and harrow incorporated twice in a silty clay soil with 5.5% organic matter, 7.8 pH, and dry and mallow, May 7. PE treatments were applied, May 8. Postemergence treatments were applied to 3-leaf wheat and green and yellow foxtail, 1 inch kochia, and 2 inch (5-leaf) wild mustard on June 1 with 60 F and sunny. Rain occurred daily for 9 days after PE treatment with 1.97 inch total rainfall. The first rains after postermergence treatment were 0.55 inch on day 5 and 6. Weed control evaluation was on June 15 and harvest on August 17.

		----------Wheat----------			-----Percent Control----		
Treatment	lb/A	Yield bu/A	%ir	%sr	Yeft	Wimu	Kocz
Trifluralin PEI	.75	34.4	0	23	100	0	100
MK-143 PEI	.75	47.7	0	7	93	91	99
MK-143 PEI	1.5	54.6	1	3	98	97	96
MK-147 PEI	0.5	46.8	0	6	93	94	99
MK-147 PEI	1.0	47.0	4	5	98	96	98
MK-143 PE	0.5	40.9	0	0	81	84	93
MK-143 PE	.75	44.7	1	3	87	90	96
MK-143 PE	1.0	48.7	0	1	89	93	100
MK-143 PE	1.5	51.1	0	5	96	100	100
MK-147 PE	0.25	48.4	0	3	96	90	99
MK-147 PE	0.5	44.9	0	6	96	96	99
MK-147 PE	0.75	46.2	0	5	98	100	100
MK-147 PE	1.0	48.5	3	14	99	100	100
MK-143 P	0.5	43.8	13	0	83	94	100
MK-143 P	1.0	40.8	25	0	92	98	100
MK-147 P	0.5	46.2	10	0	85	84	93
MK-147 P	1.0	42.9	15	0	93	93	98
Propanil P	1.25	39.1	25	3	97	83	93
2,4-D P	.25	41.1	0	0	0	100	100
Control		33.9	0	0	0	0	0
Mean		44.6	5	4	84	84	93
High mean		54.6	25	23	100	100	100
Low mean		33.9	0	0	0	0	0
Coeff. of variation		15.9	87	131	5	6	3
LSD(1 Percent)		13.3	8	10	9	9	6
LSD(5 Percent)		10.0	6	8	6	7	4
No. of reps		4.0	4	4	4	4	4

Summary

Weed control including foxtail was good with the MK compounds at all rates. Observation indicated good late season weed control with all treatments. However, a summer drought may have prevented late season weed growth.

Weed control in wheat, Carrington 1982. Coteau wheat was seeded and PEI treatments applied and incorporated on June 3. The PE treatments were applied on June 4. Postemergence treatments were applied to 4 to 6 leaf wheat. The area was relatively free of weeds so the data mainly reflects wheat response to herbicides. Stand counts were taken on June 21 for the PE and PEI treatments and harvest was 52 square feet on September 10. Propanil caused injury which was visable on June 28.

Treatment	Rate oz/A	------Wheat------- Yield lb/A	PL/50 cm	% Control T.W.
Trifluralin PEI	8	31.0	19	55
Pendimethalin PEI	12	30.4	17	55
Fluchloralin PEI	10	31.8	19	55
Trifluralin+Chlorsulfuron PEI	8+.25	32.2	16	57
Chlorsulfuron PE	.25	31.3	25	56
Propachlor PE	48	33.1	23	55
Pendimethalin PE	16	34.4	21	56
Propanil P	24	35.1	0	56
Propanil+MCPA ester P	18+4	35.0	0	57
Diclofop+Bromoxynil P	12+4	32.4	0	54
Chlorsulfuron P	.25	34.1	0	55
2,4-D P	4	33.4	0	56
Control		30.3	26	55
Mean		32.6	13	55
High mean		35.1	26	57
Low mean		30.3	0	54
Coeff. of variation		9.8	27	3
LSD(1 Percent)		6.1	7	3
LSD(5 Percent)		4.6	5	2
No. of reps		4.0	4	4

Summary

The dinitroanalin herbicides all reduced wheat plant stands, but none of the herbicides reduced yield when compared to the yield of untreated wheat which was relatively weed free.

Weed control in HRS wheat, Williston 1982. 'Morshall' wheat was seeded at 75 lb/A 2 inches deep in 7 inch row spacings on a loam soil fallowed in 1981, June 1. Preemergence once harrow incorporated (PEI) and preemergence (PE) treatments were applied to a dry soil on June 2 with 70F, 47% RH, and a 5 mph southeast wind. Postemergence treatments were to 3 leaf wheat and a high density of greenfoxtail; a medium density of Russian thistle; and a low density of redroot pigweed, prostrate pigweed, and common lambsquarters all less than 2 inches tall on June 23 with 65F, 84% RH, and a 3 mph south wind. THe experiment was a randomized complete block with 8 by 25 foot plots and harvest was based on a sample from 90 sq ft on August 27.

		-------Wheat-------			----Percent Control----				
Treatment	Rate oz/A	TW lb/bu	Yield bu/A	%sr	%ir	Grft	Rrpw	Prpw	Colq	Ruth
Trifluralin PEI	8.0	59.2	44.7	8	0	99	71	25	71	33
Pendemethalin PEI	12.0	59.5	44.6	8	0	83	45	26	44	22
Fluchloralin PEI	10.0	59.5	46.6	8	2	99	81	68	91	53
Trifluralin+Chlorsulfuron PEI	8+.25	58.3	44.6	14	4	92	99	99	99	95
Chlorsulfuron PE	0.25	57.7	38.8	8	13	83	99	99	99	96
Propachlor PE	48.0	58.7	43.1	1	0	95	70	53	45	43
Pendemethalin PE	16.0	58.6	37.3	0	0	21	0	0	0	0
Propanil P	24.0	59.3	38.9	0	0	65	98	99	99	20
Propanil+MCPA Ester P	18+4	59.3	39.1	0	0	74	99	99	99	92
Diclofop+Bromox P	12+4	59.8	44.0	0	0	89	89	91	91	92
Chlorsulfuron P	0.25	59.5	37.4	0	0	49	96	96	91	77
2,4-D P	4.0	58.9	35.7	0	0	9	98	98	98	99
Control		58.8	35.4	0	0	0	0	0	0	0
Mean		59.0	40.8	3	1	66	73	66	71	56
High Mean		59.8	46.6	14	13	99	99	99	99	99
Low Mean		57.7	35.4	0	0	0	0	0	0	0
Coeff. of Variation			7.3	97	134	17	20	26	26	36
LSD (1 Percent)			5.8	6	4	21	27	33	36	46
LSD (5 Percent)			4.3	5	3	16	20	24	27	34
No. of Reps	1.0		4.0	4	4	4	4	4	4	3

Summary

Trifluralin, pendimethlin, fluchlaralin, and chlorsulfuron caused statistically significant reduction in wheat stand. The wheat stand reduction from trifluralin in combinations with chlorsulfuron were twice either herbicide alone. Wheat yields related to the level of greenfoxtail control. 2,4-D gave good control of all groadleaf weed, wheat yields were similiar to that of untreated wheat. However, broadleaf weed densities were low. Herbicides which controlled green foxtail increased wheat yield about 9 bu/A above those of untreated or 2,4-D treated wheat.

Propanil - MCPA combinations in wheat, Fargo NW-22 1982. 'Era' wheat was seeded on May 7, 1982. Herbicide treatments were applied to 2 leaf wheat, cotyledon to 2-leaf wild mustard and rosette kochia on June 1 (65° F, 60% RH, 10 mph(NW) wind) and 5-leaf wheat, 6 to 8" mustard and 2 to 4" kochia on June 14, (70° F, 55% RH, 10 mph N wind).

Treatment	Leaf Stage	Rate oz/A	Wheat		% Control	
			%ir	Yield bu/A	Wimu	Kocz
Propanil	2	18	6	26	74	71
Propanil	2	20	5	26	81	79
MCPA ester	2	4	0	28	96	88
MCPA ester	2	8	0	27	99	98
Propanil + MCPA ester	2	18+4	9	23	99	97
Propanil + MCPA ester	2	18+8	9	25	99	97
Propanil + MCPA ester	2	20+4	9	30	99	96
Propanil + MCPA ester	2	20+8	13	27	99	93
Propanil	5	18	8	25	61	60
Propanil	5	20	10	25	50	65
MCPA ester	5	4	0	29	94	73
MCPA ester	5	8	0	25	96	82
Propanil + MCPA ester	5	18+4	14	27	97	89
Propanil + MCPA ester	5	18+8	15	21	97	90
Propanil + MCPA ester	5	20+4	16	21	98	90
Propanil + MCPA ester	5	20+8	19	23	97	89
Control			0	12	0	0
LSD (0.05)			7	5	6	8

Summary

The combination propanil plus MCPA ester generally caused more wheat injury than propanil or MCPA ester alone, regardless of growth stage. However increased wheat injury did not influence wheat yields except, when propanil plus MCPA ester was applied to 5-leaf wheat. The combination propanil plus MCPA and MCPA ester alone gave better wild mustard control than propanil alone. While, propanil plus MCPA ester in combination gave better kochia control than propanil or MCPA ester alone.

Propanil - MCPA combinations in wheat, Casselton 1982. 'Era' wheat seeded on May 21, 1982. Herbicide treatments were applied to 2-leaf wheat, 1 to 2" wild mustard, cotyledon to 2-leaf sunflower and rosette kochia June 10 (65°F, 70% RH, 10 mph N wind) and 4-leaf wheat, 4 to 6" wild mustard, 4 to 7" sunflower and 3 to 5" kochia on June 17 (68°F, 60%RH, 5 mph N wind).

Treatments	Leaf Stage	Rate oz/A	%ir	% Control		
				Wimu	Snfl	Kocz
Propanil	2	18	5	78	56	66
Propanil	2	20	5	80	67	69
MCPA ester	2	4	0	97	86	60
MCPA ester	2	8	0	98	97	88
Propanil + MCPA ester	2	18+4	9	99	95	90
Propanil + MCPA ester	2	18+8	11	99	96	90
Propanil + MCPA ester	2	20+4	8	97	95	90
Propanil + MCPA ester	2	20+8	14	96	97	92
Propanil	4	18	5	83	60	48
Propanil	4	20	9	82	68	62
MCPA ester	4	4	0	98	97	76
MCPA ester	4	8	0	98	97	65
Propanil + MCPA ester	4	18+4	9	97	94	77
Propanil + MCPA ester	4	18+8	15	98	97	87
Propanil + MCPA ester	4	20+4	13	98	97	84
Propanil + MCPA ester	4	20+8	20	98	97	90
Control				0	0	0
LSD (0.05)			4	4	10	15

Summary

The propanil plus MCPA ester combination generally caused more injury than propanil alone. Wheat injury was slightly higher when herbicides were applied to 4-leaf wheat than 2-leaf wheat. Wheat yields were variable due to dry environmental conditions. MCPA ester with or without propanil gave better weed control than propanil regardless of leaf stage of application. However, the combination propanil plus MCPA ester was needed for kochia control, but kochia control was better when the herbicide combination was applied at the 2-leaf compared to the 4-leaf stage.

Hard red spring wheat response to propanil alone or in combination with MCPA, Fargo, 1982. Ten wheat cultivars were seeded in silty clay soil pH 7.9 and 6.0% organic matter April 28. Treatments were applied with a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi to 2 to 3-leaf wheat on May 20. Precipitation for a 2 week period following application was 0.21 inch. The experiment was a randomized complete block with three replications. Experimental units were 10 by 12 ft. Injury was evaluated June 18 and plots harvested August 13.

	% Injury			Yield bu/A			
Cultivar	Prnl 1.5	Prnl + MCPA 1.1 + 1.5	Mean	Control	Prnl 1.5	Prnl + MCPA 1.1 + 1.5	Mean
Era	2	7	5	47.1	43.4	45.1	45.2
Solar	3	8	5	45.3	43.8	42.5	43.9
Len	7	10	9	47.1	44.7	45.6	45.8
James	3	8	5	47.1	42.7	47.0	45.6
Waldron	8	8	8	43.3	36.9	39.3	39.8
Coteau	5	7	6	39.2	38.5	40.2	39.3
Alex	3	4	4	42.3	42.9	44.2	43.1
Butte	5	8	6	40.4	40.1	41.4	40.6
PB711	2	5	4	50.8	44.2	45.1	46.7
Oslo	1	6	4	45.4	43.3	42.1	43.6
Mean	4	7	5	44.8	42.1	43.2	
LSD (0.05)	TRT 4 CULT 3 TRT X CULT 10			TRT 3 CULT 8 TRT X CULT 10			

Summary

Hard red spring wheat injury with propanil alone ranged from 1 to 8% and in combination with MCPA from 4 to 10%. However, neither treatment significantly reduced yield of any cultivar.

Chlorsulfuron incombination with additives for weed control in wheat, Fargo NW 22 1982. 'Era' wheat was seeded to a silty clay soil with 7.5 pH and 5.5% organic matter on May 7. Treatments were applied during 65 F and sunny with a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi on 3-leaf wheat, 2 to 3-leaf foxtail and 1 inch kochia on June 2. Experimental units were 10 by 24 ft. with a randomized complete block design. An area 4 X 24 ft was harvested for yield August 17.

		----Wheat----	-------July 7------			-August 10-	
Treatment	Rate oz/A	Yield bu/A	%ir	Fxtl	Kocz	Fxtl	Kocz
Chlorsulfuron	.125	27.4	0	54	50	59	49
Chlorsulfuron+WK	.125+0.25%	33.3	0	53	96	66	100
Chlorsulfuron+LOTM	.125+.25G	33.3	0	60	96	74	100
Chlorsulfuron+OC	.125+.25G	28.3	0	60	100	70	100
Chlorsulfuron+ETGL	.125+1G	26.4	0	45	51	60	61
Chlorsulfuron	0.25	24.1	0	51	51	63	70
Chlorsulfuron+WK	0.25+.25%	26.6	1	75	100	79	100
Chlorsulfuron+LOTM	0.25+0.25G	27.2	0	69	100	85	100
Chlorsulfuron+OC	0.25+0.25G	25.6	0	68	100	76	100
Chlorsulfuron+ETGL	0.25+1G	25.8	4	61	36	76	44
Chlorsulfuron	0.5	26.2	0	68	69	85	79
Chlorsulfuron+WK	0.5+0.25%	27.2	0	72	100	83	100
Chlorsulfuron+LOTM	0.5+0.25G	24.8	3	79	100	92	100
Chlorsulfuron+OC	0.5+0.25G	27.2	1	86	100	88	100
Chlorsulfuron+ETGL	0.5+1G	21.3	1	64	62	82	59
Control		21.5	0	0	0	0	0
Mean		26.6	1	60	76	71	79
High mean		33.3	4	86	100	92	100
Low mean		21.3	0	0	0	0	0
Coeff. of variation		19.6	398	17	17	11	14
LSD(1 Percent)		9.8	5	19	24	14	21
LSD(5 Percent)		7.4	4	14	18	11	16
No. of reps		4.0	4	4	4	4	4

Summary

July and August evaluations tend to indicate slightly better foxtail control with chlorsulfuron combination with LOTM, OC, and WK than chlorsulfuron alone or with ethylene glycol (ETGL). Kochia control was adequate with all treatments except chloruslfuron at all rates alone and in combination with ETGL. Wheat yield tended to be highest with chlorsurfuron at all rates in combination with WK, LOTM, and OC except chlorsulfuron at 0.5 oz/A incombination with LOTM. Wheat with all treatments except chlorsulfuron at 0.5 oz/A in combination with ETGL yielded more than untreated wheat.

Chlorsulfuron incombination with various surfactant volumes for weed control in wheat, Fargo NW22. 'Era' wheat was seeded to a silty clay soil with 7.5 pH and 5.5% orginic matter May 7. Treatments were applied during 60 F and sunny with a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi on 3-leaf wheat, 2 to 3-leaf foxtail, and 1 inch kochia June 2. Experimental design was a randomized complete block with experimental units being 10 by 24 ft. An area 4 X 24 was harvested for yield August 17.

		----Wheat----					
	Rate	Yield	------July 7------			-August 10-	
Treatment	oz/A	bu/A	%ir	Fxtl	Kocz	Fxtl	Kocz
Chlorsulfuron	.125	26.2	0	51	31	56	35
Chlorsulfuron+WK	.125+.05%	28.8	0	51	100	68	100
Chlorsulfuron+WK	.125+.1%	26.6	0	49	100	66	100
Chlorsulfuron+WK	.125+.25%	25.6	0	54	100	69	100
Chlorsulfuron+WK	.125+.5%	30.4	0	55	100	59	100
Chlorsulfuron+X-77	.125+.05%	33.7	0	54	94	68	99
Chlorsulfuron+X-77	.125+.1%	31.0	2	61	99	76	100
Chlorsulfuron+X-77	.125+.25%	27.0	0	63	100	84	100
Chlorsulfuron+X-77	.125+.5%	31.7	1	58	100	69	100
Control		23.2	0	0	0	0	0
Mean		28.4	0	50	82	62	83
High mean		33.7	2	63	100	84	100
Low mean		23.2	0	0	0	0	0
Coeff. of variation		22.7	435	31	7	20	11
LSD(1 Percent)		12.6	3	30	11	24	18
LSD(5 Percent)		9.4	2	22	8	18	13
No. of reps		4.0	4	4	4	4	4

Summary

Kochia control with chlorsulfuron was enhanced by both WK and X-77 at all concentrations compared to control by chlorsulfuron applied alone. Surfactant concentration did not affect foxtail control but X-77 in combination with chlorsulfuron tended to give slightly better foxtail control and higher yields than WK in combination with chlorsulfuron. Wheat yield was increased by all treatments compared to the yield of the control.

Napthalic anahydride as a safener for chlorsulfuron in barley, Fargo 1982. Chlorsulfruron was applied and field cultivator incorporated twice and Beacon barley treated or non-treated with napthalic anahydride (NA) seeded in 6 inch row spacings May 7. The soil was dry to a depth or 1 inch and rainfall for a two week period following application totaled 1.54 inch. All treatments were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 27 ft. Crop injury and stand reduction ratings were made July 23.

		Barley			
Treatment	Rate lb/A	Yield bu/A	%ir	%sr	Ht
Chlorsulfuron	0.25	59.1	0	3	80
Chlorsulfuron	0.37	57.2	0	8	78
Chlorsulfuron	0.5	51.2	0	18	77
Chlorsulfuron	0	58.6	0	1	82
Chlorsulfuron+NA	0.25	54.4	0	4	77
Chlorsulfuron+NA	0.37	56.6	0	10	75
Chlorsulfuron+NA	0.5	56.5	0	12	78
Chlorsulfuron+NA	0	63.5	0	0	81
Mean		57.1	0	7	78
High mean		63.5	0	18	82
Low mean		51.2	0	0	75
Coeff. of variation		7.2	0	97	4
LSD(1 Percent)		8.2	0	13	6
LSD(5 Percent)		6.1	0	10	4
No. of reps		4.0	4	4	4

Summary

No barley injury was observed with any treatment. Barley stand reductions with chlorsulfuron ranged from 3 to 18% without NA and 4 to 12% with NA.

Postemergence weed control in flax, Casselton 1982. Culbert flax (one half of replication one was Flor) was seeded May 21. Treatments were applied to 3 to 4 inch flax and 3 to 4 leaf wild mustard and yellow foxtail June 15. Weed densities were yellow foxtail 3/sq ft and the other weeds each less than 1/sq yd. Harvest was on September 21 and evaluation on July 9.

Treatment	oz/A	-Culbert Flax Yield bu/A	%ir	%sr	Flor %ir	-----Percent Control---- Wimu	Yeft	Rrpw	Colq	Kocz
MCPA+Dalapon	4+12	12.1	0	0	0	98	55	0	94	80
MCPA ester+Dalapon	4+12	12.0	5	0	0	98	74	90	100	85
2,4-D+Dalapon	4+12	9.7	34	0	40	98	75	90	100	99
2,4-D+Picloram+Dalapon	4+.25+12	6.3	44	0	45	99	61	93	100	99
BAS-9052+OC	3+.25G	13.9	0	0	0	0	99	0	0	0
BAS-9052+MCPA+OC	3+4+.25G	14.3	1	0	0	99	98	80	99	85
BAS-9052+MCPA	3+4	13.6	0	0	0	98	91	80	99	85
BAS-9052+Bromoxynil+OC	3+4+.25G	15.5	1	0	0	87	98	95	100	99
BAS-9052+Bromoxynil	3+4	14.2	0	0	0	83	96	85	99	90
PP-009+OC	3+.25G	11.2	0	0	0	0	80	0	0	0
PP-009+MCPA+OC	3+4+.25G	14.1	4	0	5	98	92	73	99	85
PP-009+MCPA	3+4	12.8	1	0	5	99	79	70	99	85
PP-009+Brox+OC	3+4+.25G	13.1	3	0	0	83	96	85	95	95
PP-009+Brox	3+4	13.6	0	0	0	79	80	75	93	85
Asulam+S	16+.2%	14.8	5	0	20	91	88	50	90	60
Asulam+MCPA+S	12+4+.2%	13.1	14	0	35	100	91	60	99	90
Asulam+Brox+MCPA+S	12+4+4+.2%	13.6	8	0	5	100	91	88	99	100
BAS-9052+2,4-D	3+4	13.6	12	0	20	98	81	78	99	93
Asulam+S	24+.2%	12.6	15	0	30	100	90	60	94	83
Asulam+Ethephon+S	24+.4%+.2%	12.9	3	0	20	95	95	70	95	50
MCPA	4	14.5	0	0	0	99	0	70	99	50
Bromoxynil	4	13.3	1	0	5	85	10	90	95	75
Bromoxynil+MCPA	4+4	14.1	0	0	5	100	8	97	100	100
Control		10.5	0	0	0	0	0	0	0	0
Mean		12.9	6	0	10	83	72	66	85	74
High mean		15.5	44	0	45	100	99	97	100	100
Low mean		6.3	0	0	0	0	0	0	0	0
Coeff. of variation		20.2	56	0	0	7	13	0	5	0
LSD(1 Percent)		4.8	6	0	0	10	18	0	7	0
LSD(5 Percent)		3.7	5	0	0	8	14	0	5	0
No. of reps		4.0	4	4	1	4	4	1	4	1

Summary

2,4-D applied with dalapon or dalapon+picloram caused injury to flax and lowered or tended to lower flaxseed yield compared to flax treated with MCPA + dalapon. Flor flax was injured more than Culbert by asulam. BAS-9052 or PP-009 with oils and MCPA, 2,4-D or bromoxynil and asulam with MCPA alone or with bromoxynil gave good grass and broadleaf weed control without important injury to flax.

Weed control in flax, Minot 1982. PPI treatments applied, and field cultivator incorporated, Culbert flax seeded, and PE treatments applied on June 25. Post treatments were applied to 2 to 3 inch flax, 1 to 2 inch foxtail, and 0.5 inch prostrate and redroot pigweed on June 17. Weed density was light at about one weed per square foot. Evaluation on July 14.

		------Flax-------			----Percent Control---			
Treatment	Rate oz/A	Yield bu/A	%ir	%sr	Grft	Wibw	Prpw	Rrpw
Metolachlor+MCPA PPI+P	40+4	17.9	2	5	97	47	100	100
Metolachlor+MCPA PE+P	40+4	18.6	0	0	83	17	99	95
MCPA ester+Dalapon P	4+12	16.2	3	29	58	28	0	50
MCPA amine+Dalapon P	4+12	16.3	5	0	88	17	95	95
BAS-9052+OC P	3+.25G	18.3	0	0	97	0	0	0
BAS-9052+MCPA+OC P	3+4+.25G	18.5	0	0	98	0	100	100
BAS-9052+Bromoxynil+OC	3+4+.25G	17.6	0	0	97	57	95	95
BAS-9052+Chlorsulfuron+OC	3+.062+.25G	17.9	2	0	99	97	100	100
Asulam+S P	16+.2%	16.8	2	3	77	97	0	100
Asulam+MCPA+S	12+4+.2%	15.8	12	7	78	95	100	100
Asulam+MCPA+Brox+S P	12+4+4+.2%	17.1	8	3	67	95	99	99
Control		15.9	0	0	0	0	0	0
Mean		17.3	3	4	78	46	66	78
High mean		18.6	12	29	99	97	100	100
Low mean		15.8	0	0	0	0	0	0
Coeff. of variation		7.8	91	385	23	64	0	0
LSD(1 Percent)		3.1	6	35	41	67	0	0
LSD(5 Percent)		2.3	4	26	30	49	0	0
No. of reps		3.0	3	3	3	3	1	1

Summary

BAS-9052 + chlorsulfuron gave the highest weed control. BAS-9052 alone or with MCPA, Bromoxyynil, or Chlorsulfuron gave control of green foxtail. All BAS-9052 treatments were with 1 qt/A of petroleum oil containing 17% emulsifier.

Weed control in flax, Williston 1982. Preplant (PPI) treatment applied and incorporated once with a triple K and once with a Glenco, 'Lennot' flax seeded at 50 lb/A 1.5 inches deep in 6 inch row spacings, and preemergence treatment applied on May 19 with 69F, 69% RH, and a southeast wind at 14 mph. Postemergence treatments were to 3 inch flax; to a medium density of 2 to 3 leaf green foxtail and ½2 inch tall redroot pigweed; to a low density of 5 leaf wild oats and 2 inch tall wild mustard; and to high density of 2 inch tall Russian thistle on June 14 with 80F, 51% RH, and an east wind at 10 mph. The experiment was a randomized complete block with 8 by 25 ft plots established on a loam soil which was fallowed in 1981, fertilized with 45 lb N/A and contained 2.1% organic matter. Harvest was from 88 sq ft area on September 10.

		-----Flax-----				----Percent Control----					
Treatment	Rate oz/A	TW lb/bu	Yld bu/A	%sr	%ir	Ruth	Colq	Grft	Wioa	Wimu	Rrpw
Metolachlor+MCPA PPI+P	40+4	50	6	18	3	21	100	99	45	100	91
Metolachlor+MCPA PE+P	40+4	49	8	8	3	14	92	94	31	95	89
MCPA Ester+Dalapon P	4+12	51	6	4	1	20	63	49	15	97	33
MCPA Amine+Dalapon P	4+12	52	8	9	0	45	92	80	6	97	53
BAS-9052+OC P	3+.25G	49	8	0	0	0	0	100	100	0	0
BAS-9052+MCPA+OC P	3+4+.25G	52	13	0	0	51	80	98	86	98	55
BAS-9052+Bromoxynil+OC P	3+4+.25G	56	17	4	2	98	99	99	99	100	95
BAS-9052+Chlorsulfuron+OC P	3+.062+.25G	56	19	1	1	99	100	99	100	100	100
Asulam+S P	16+.2%	52	9	1	2	10	53	96	96	97	60
Asulam+MCPA+S P	12+4+.2%	51	8	3	4	44	96	90	80	99	68
Asulam+MCPA+Bromoxynil+S P	12+4+4+.2%	54	12	4	6	98	100	94	91	100	96
Control		49	7	0	0	0	0	0	0	0	0
Mean		52	10	4	2	42	73	83	62	82	61
High Mean		56	19	18	6	100	100	100	100	100	100
Low Mean		49	6	0	0	0	0	0	0	0	0
Coeff. of Variation		.	18	165	202	41	31	16	28	5	33
LSD (1 Percent)		.	3	13	7	33	52	26	34	7	39
LSD (5 Percent)		.	3	10	5	25	38	19	26	5	29
No. of Reps		1	4	4	4	4	3	4	4	4	4

Summary

Flax yield related to control of both grass and broadleaf weeds. Russian thistle control was highest with chlorsulfuron and bromoxynil with an oil or surfactant.

Flax variety response to asulam, Langdon 1982. Asulam was applied to the flax in the variety evaluation experiment conducted by the Langdon Experiment station. Asulam was applied to bud stage flax 10 to 12 inch tall on July 2 with 70F and a 0.03 inch rain occurred 10 minutes after treatments were applied. Injury evaluations were on July 7.

Treatment	Rate lb/A	Percent Injury							
		Norlin	Culbt79	Linott	Wishek	McGregor	Dufferin	Flor	Culbert
Asulam+S	1+.2%	2	2	2	2	3	2	3	3
Asulam+S	2+.2%	2	0	0	0	0	0	3	3
Control		0	0	0	0	0	0	0	0
Mean		1	1	1	1	1	1	2	2
High mean		2	2	2	2	3	2	3	3
Low mean		0	0	0	0	0	0	0	0
Coeff. of variation		237	300	300	300	300	300	237	237
LSD(1 Percent)		10	6	6	6	13	6	20	20
LSD(5 Percent)		6	4	4	4	8	4	12	12
No. of reps		3	3	3	3	3	3	3	3

Summary

None of the flax varieties were injured greatly by asulam even at 2 lb/A. Flor and Culbert tended to be injured more than the other varieties.

Flax variety response to asulâm, Minot 1982. The asulum was applied to 3 to 4 inch flax across the varieties so that individual plots were 4 ft by 5 ft, June 17.

Treatment	Rate lb/A	Percent Control								
		FP 707	Morlow	Norlin	McGrgr	Duffrn	Flor	Culb79	Culbert	Wishek
Asulam+S	1+.2%	38	58	38	9	17	45	43	38	27
Asulam+S	2+.2%	47	58	62	18	24	67	67	58	52
Control		0	0	0	0	0	0	0	0	0
Mean		28	39	33	9	14	37	37	32	26
High mean		47	58	62	18	24	67	67	58	52
Low mean		0	0	0	0	0	0	0	0	0
Coeff. of variation		32	26	51	44	78	41	65	74	59
LSD(1 Percent)		34	37	64	15	40	58	90	90	58
LSD(5 Percent)		21	23	39	9	24	35	54	54	35
No. of reps		3	3	3	3	3	3	3	3	3

Summary

All varieties appeared severely injured by asulam. However, rating was difficult because of excessive soil erosion which reduced flax stand. Thus, variety differences were difficult to determine. Dufferin and McGregor appeared more tolerant than the other varieties.

Preplant incorporated in weed control in sunflower, Casselton 1982. All herbicides were applied preplant and field cultivator with harrow incorporated twice unless indicated otherwise. Preplant incorporated (PPI) treatments were applied, '894' sunflower was seeded in 30 inch rows, and preemergence (PE) treatments were applied to a soil with good tilth on May 27. Herbicides were applied in 17 gpa at 35 psi to an 8 ft width the length of 10 by 25 ft plots. Weed densities were 20, 2, and 2 plants/sq ft for yellow foxtail, wild mustard, and kochia, respectively.

				June 22			Sept 21	
		Sunflower						
Treatment	lb/A	%ir	%sr	Yeft	Wimu	Colq	Wimu	Yeft
EPTC	2	0	0	88	16	78	16	48
EPTC	3	0	4	97	83	95	26	63
EPTC&R-33865	2	0	3	87	21	81	29	50
EPTC&R-33865	3	5	4	95	78	95	50	68
EPTC+Trifluralin	2+.5	0	0	99	65	97	60	91
EPTC&R-33865+Trifluralin	2+.5	5	5	98	76	96	57	96
EPTC+Chloramben	1.5+2	10	8	99	98	100	94	94
EPTC+Chloramben	2+1.5	6	9	99	98	100	89	95
EPTC+Chloramben	2.5+3	10	11	99	100	100	94	98
EPTC+R-40244	2+.25	3	0	91	89	95	68	44
EPTC+R-40244	2+.5	1	4	87	86	95	83	20
EPTC+R-40244 PPI+PE	2+.5	6	6	98	99	100	97	56
Trifluralin	1	3	3	98	8	96	15	98
Trifluralin+R-40244	1+.5	3	5	99	96	78	88	97
Trifluralin+R-40244 PPI+PE	1+.5	3	6	99	100	100	96	94
Trifluralin+Chloramben	1+1.5	3	6	99	93	98	88	96
Trifluralin+Chloramben PPI+PE	1+3	4	15	100	99	100	96	100
Trifluralin+Metribuzin-W	1+.125	9	6	97	81	77	50	87
Trifluralin+Metribuzin-W	1+.188	14	16	99	87	100	66	98
Trifluralin+Metribuzin-W	1+.25	8	5	93	61	88	56	82
Trifluralin+Metr-W PPI+PE	1+.125	6	5	98	77	96	59	90
Trifluralin+Metr-W PPI+PE	1+.188	11	9	99	94	96	71	97
Trifluralin+Metr-W PPI+PE	1+.25	16	21	99	96	100	67	96
Trifluralin+Dino&Napt	1+2.25	14	45	73	90	92	32	14
Trifluralin+Dino&Napt	1+3	24	38	84	93	100	13	32
Pendimethalin	1.5	3	3	98	10	93	10	97
Pendimethalin+Chloramben	1+2	5	5	99	97	100	89	99
Pendimethalin+Chloramben	1.5+1.5	3	5	99	99	100	89	97
Pendimethalin+Chloramben	1.5+3	16	11	100	100	100	100	100
Metolachlor	3	0	0	95	76	86	33	70
Metolachlor+Chloramben	2+2	14	8	99	98	100	99	98
Metolachlor+Chloramben	3+3	15	19	100	100	100	98	98
Chloramben	3	11	14	99	99	100	96	93
Fluchloralin	1	0	0	97	16	91	20	91
R-40244	0.5	0	0	8	99	100	96	0
R-40244	1.0	3	0	41	100	100	100	5
FOE-2602	1	0	0	75	8	35	0	44
FOE-2602	2	3	4	92	25	68	0	68
FOE-2602	3	0	0	99	78	93	68	90
CGA-82725	.25	0	0	49	0	0	0	28
CGA-82725	0.5	0	0	51	0	0	0	53
Control weedy		0	0	0	0	0	0	0
Control weed free		0	0	0	0	0	98	97

Table . Continued

Treatment	lb/A	June 22					Sept 21	
		Sunflower						
		%ir	%sr	Yeft	Wimu	Colq	Wimu	Yeft
Mean		5	7	85	69	84	59	73
High mean		24	45	100	100	100	100	100
Low mean		0	0	0	0	0	0	0
Coeff. of variation		103	118	10	22	16	29	22
LSD(1 Percent)		10	15	16	27	25	32	29
LSD(5 Percent)		8	11	12	21	19	24	22
No. of reps		4	4	4	4	4	4	4

Summary

Chloramben at 1.5 to 3 lb/A alone or in combination with herbicides for grass control gave 85% or more wild mustard control. R-40244 at 0.5 lb/A tended to give higher wild mustard control when applied alone preplant incorporated with a herbicide for grass weed control.

Herbicide incorporation in sunflower, Cass 1982. The herbicides were applied and incorporated into the soil and 894 sunflower seeded, May 27. FC-1 was one incorporation by the field cultivator with an attached harrow and FC-2 was two incorporations. H-1 was incorporated with one pass of the harrow and H-2 was two passes. The experiment was arranged on a split block with incorporation methods of whole plots.

				-----Percent Control-----		
	Rate	--Sunflowers--			----Aug. 12----	
Treatment	lb/A	%ir	%sr	Yeft	Yeft	Wimu
Trifluralin FC-1	.75	0	0	91	81	3
Fluchloralin FC-1	.75	0	0	93	89	0
Pendimethalin FC-1	1.125	0	0	92	86	3
EPTC FC-1	2	0	0	84	62	0
Control FC-1		0	0	0	0	0
Trifluralin FC-2	.75	0	0	97	93	0
Fluchloralin FC-2	.75	0	0	97	93	0
Pendimethalin FC-2	1.125	0	0	95	93	0
EPTC FC-2	2	0	0	86	74	0
Control FC-2		0	0	0	0	0
Trifluralin H-1	.75	0	0	72	70	0
Fluchloralin H-1	.75	0	0	77	70	0
Pendimethalin H-1	1.125	0	0	85	77	0
EPTC H-1	2	0	0	49	44	0
Control H-1		0	0	0	0	0
Trifluralin H-2	.75	0	0	80	79	0
Fluchloralin H-2	.75	0	0	78	78	0
Pendimethalin H-2	1.125	0	0	78	76	0
EPTC H-2	2	0	0	63	54	0
Control H-2		0	0	0	0	0
Mean		0	0	66	61	0
High mean		0	0	97	93	3
Low mean		0	0	0	0	0
Coeff. of variation		0	0	9	14	616
LSD(1 Percent)		0	0	12	16	3
LSD(5 Percent)		0	0	9	12	2
No. of reps		4	4	4	4	4

Summary

The herbicides generally were more effective when incorporated into the soil by two field cultivators than one field cultivator or one or two harrowings. Pendimethalin gave higher foxtail control than the other herbicides with one harrow incorporation.

Preemergence weed control in sunflower, Casselton. '894' sunflower was seeded in 30 inch spaced rows and herbicide treatments applied on May 28. The rainfall for 10 days after treatment was 0.25, 0.20, and 0.49 inch at 1,3,and 9 days, respectively. Percent weed control, and sunflower stand (SR) and injury (IR) were evaluated on June 22.

Treatment	Rate lb/A	---Sunflower--- %ir	%sr	Percent Control Yeft	Wimu
Chloramben	2	15	8	98	90
Chloramben	3	4	6	98	92
Chloramben-W	1.8	5	0	95	94
Chloramben-W	2.7	8	5	98	97
Chloramben+Pendimethalin	2+1	8	5	99	98
Chloramben+Pend (residue)	3+1.5	5	5	99	99
Chloramben+Metolachlor	2+2	15	8	98	95
Chloramben+Metolachlor	3+3	5	1	99	96
R-40244	0.5	1	0	28	100
R-40244	1	10	0	65	100
R-40244+Pendimethalin	0.5+1	10	3	75	100
Pendimethalin	1.5	3	0	85	69
CGA-82725	0.25	0	0	5	0
CGA-82725	0.5	0	0	50	0
FOE-2602	1	0	0	61	0
FOE-2602	2	0	0	91	55
FOE-2602	3	8	1	89	43
Control weedy		0	0	0	0
Control weed free		0	0	0	0
Mean		5	2	70	65
High mean		15	8	99	100
Low mean		0	0	0	0
Coeff. of variation		191	198	14	24
LSD(1 Percent)		18	8	19	29
LSD(5 Percent)		14	6	14	22
No. of reps		4	4	4	4

Summary

R-40244 at 0.5 lb/A alone or in combination with pendimethalin gave 100% control of wild mustard. Chloramben regardless of formulation gave more than 90% control of wild mustard and yellow foxtail.

Prometryn for wimu control in sunflower, Casselton 1982. PPI treatments were applied and incorporated twice with a field cultivator with harrow, '894' sunflower seeded, and PE treatment applied May 27.

Treatment	Rate lb/A	-Sunflowers- %ir	%sr	---Percent Control--- Yeft	Wimu	Colq
Trifluralin+Chloramben PPI	1+1.5	8	10	99	97	100
Trifluralin+Prometryn PPI	1+1.5	3	5	98	76	90
CGA-82725+Prometryn PPI	0.5+1.5	0	0	76	68	88
CGA-82725+Prometryn PE	0.5+1.5	0	0	60	74	85
CGA-82725+Chloramben PE	0.5+1.5	3	0	92	83	95
Control weedy		0	0	0	0	0
Control weedfree		0	0	0	0	0
Mean		2	2	61	57	65
High mean		8	10	99	97	100
Low mean		0	0	0	0	0
Coeff. of variation		193	228	11	17	8
LSD(1 Percent)		7	10	14	19	11
LSD(5 Percent)		5	7	10	14	8
No. of reps		4	4	4	4	4

Summary

Chloramben tended to be more effective for wild mustard control than prometryn at equal rates surface applied or incorporated.

Fall herbicides in sunflower, Absaraka 1982. FI treatments were applied to a wet soil and tandem disk incorporated once and (FS) treatment surface applied on October 30, 1981. Spring (SI) treatments were applied and incorporated as part of the seedbed preparation with a field cultivator with attached furrow, April 28. '894' hybrid sunflower was seeded May 28.

Treatment	Rate lb/A	---Sunflower--- %ir	%sr	Percent Yeft	Control Colq
Pendimethalin FI	1	0	0	97	95
Pendimethalin FI	2	0	5	96	96
Pendimethalin (FS)	1	0	0	83	65
Trifluralin G FI	3/4	0	3	94	91
Trifluralin L FI	3/4	0	0	91	87
Trifluralin+R-40244 FI	3/4+1/2	0	0	95	95
Metolachlor+Prometryne FI	3+1.5	0	0	33	35
EPTC+R-40244 FI	4+1/2	1	0	54	44
Pendimethalin (SI)	1	0	1	99	97
Trifluralin+R-40244 SI	3/4+1/2	3	1	97	99
Trifluralin+Chloramben SI	3/4+1.5	3	9	99	100
Trifluralin+Prometryne SI	3/4+1/5	4	0	90	86
Metolachlor+Prometryne SI	3+1.5	0	0	84	90
EPTC+R-40244 SI	2.5+1/2	0	1	94	98
Weed free control		0	0	0	0
Cultivated control		0	0	13	0
Mean		1	1	76	74
High mean		4	9	99	100
Low mean		0	0	0	0
Coeff. of variation		428	308	16	18
LSD(1 Percent)		5	7	22	24
LSD(5 Percent)		4	5	17	18
No. of reps		4	4	4	4

Summary

None of the herbicide treatments caused important injury or stand reduction to sunflower. The low foxtail control with fall applied EPTC may have been from loss of the herbicide during the warm period which followed application. Further fall herbicide incorporation was not thourough because of the wet trashy condition. Metolachlor also was less effective when fall than spring applied.

Weed control in sunflower, Williston, 1982. Preplant (PPI) herbicides were applied to a dry soil surface and incorporated by one pass with a Triple K and one with a Glenco and Interstate '894' sunflower seeded on May 25 with 60F, 70% R.H., and a 5 mph south wind. The sunflower was seeded 2 inches deep in rows 32 inches apart and after emergence were thinned to 18,000 plant/A. Preemergence herbicide treatments were applied to a dry soil on May 25 with 65F, 65% R.H., and a 7 mph southwest wind. Postemergence treatments were to 2 to 4 leaf sunflower, a medium density of 2 to 3 leaf wild oats and green foxtail; a low density of 2 inch wild mustard and common lambsquarters, a medium density of 2 inch redroot pigweed, and a high density of 2 inch Russian thistle on June 16 with 62F, 87% R.H. and a south wind at 4 mph. The experiment was a randomized complete block with 8 by 30 ft plots established on a loam soil with 2.1% organic matter, fertilized at 45 lb/AN and on an area fallowed in 1981. Harvest was an area of 50 sq. ft. on September 22.

Treatment		Rate	Sunflower TW	Sunflower Yield	Weed control Grft	Wioa	Wimu	Rrpw	Ruth	Colq	Sunflower SR	Sunflower IR
		oz/A	lb/bu	lb/A	----------	----------	----------	----------	----------	----------	%	----------
Trifluralin	PPI	12	33.9	979	96	90	0	97	89	98	1	0
Trifluralin+Chloramben	PPI	12+24	32.9	1103	98	94	81	96	89	96	0	0
Pendimethal+Chloramben	PPI	18+24	33.4	1167	92	85	83	92	74	86	1	0
EPTC+Chloramben	PPI	40+24	33.0	991	99	99	93	94	69	90	1	0
Metholchlor+Chloramben	PPI	40+24	33.7	935	96	80	78	84	63	91	0	0
Trifluralin+R 40244	PPI	12+4	33.3	1100	98	93	95	97	81	98	0	0
Trifluralin+R 40244	PPI	12+8	33.0	1166	98	93	97	97	83	93	0	0
EPTC+R 40244	PPI	40+8	32.8	801	98	98	98	92	19	90	0	1
Methochlor+Chloramben	PE	40+24	33.8	838	92	58	74	85	60	57	1	4
Metolochlor+R 40244	PE	40+8	33.0	885	96	81	99	95	28	94	0	0
R 40244+BAS 9052	PE+P	8+3	34.0	830	97	97	98	74	28	88	0	3
Trifluralin+Desmedipham	PPI+P	12+6	33.7	926	95	93	88	98	93	99	1	11
Trifluralin+Desmedipham	PPI+P	12+8	33.2	1127	98	94	90	98	89	98	3	14
Trifluralin+Desmedipham	PPI+P	12+12	33.4	1179	99	94	94	97	90	98	1	16
BAS 9052+R 40244	P	3+2	33.4	887	93	97	97	50	45	92	2	15
BAS 9052+Desmedipham	P	3+8	33.0	896	83	78	88	83	49	67	1	20
BAS 9052+OC	P	3+.25G	33.1	609	98	98	0	0	0	0	0	0
Control Weed free			33.0	1267	99	99	99	99	99	99	0	0
Control Weedy			33.1	536	0	0	0	0	0	0	0	0
High Mean			34.0	1267	99	99	99	99	99	99	3	20
Low Mean			33.8	536	0	0	0	0	0	0	0	0
Exp Mean			33.3	959	91	85	76	80	60	81	1	4
C.V. %				15	4	11	10	7	23	12	268	76
LSD 5%				204	6	13	10	9	20	15	3	5
LSD 1%				272	8	18	14	11	26	21	3	6
# of Reps			1	4	4	4	4	4	4	3	4	4

Summary

R-40244 at 4 or 8 oz/A preplant incorporated or preemergence or at 8 oz/A postemergence gave more than 90% wild mustard control without important sunflower stand reduction or injury. Wild mustard control with chloramben was generally lower than that with R-40244 or desmedipham. Green foxtail and wild oats control was good with all treatments except wild oats control was only 57% with surface applied methdachlor in combination with R-40244. Russian thistle control was not enhanced by R-40244 added to other base treatments. Desmedipham from 6 to 12 oz/A gave good wild mustard control without severe injury to sunflower. Sunflower seed yield tended higher from plants on plots treated with desmedipham at 8 or 12 oz/A than 6 oz/A. However, the trend for yield differences did not relate to differences in weed control. In general sunflower yield tended to relate to the percent weed control.

Weed control in sunflower, Carrington 1982. Preplant herbicides applied and incorporated, '894' sunflower seeded, and preemergence herbicide treatments applied on June 4. Postemergence treatments were to 4 to 6 leaf sunflower on June 30. Sunflower injury and weed control evaluations were on July 9 and September 4. Harvest was 40 sq. ft. on October 27 and November 1. Two inches of rain occurred within one week after sunflower seeding and preemergence treatments.

		Percent									
		July9	Sept. 4								
Treatment	Rate (oz/A)	Fxtl cntl	Sufl inj	Fxtl cntl	Rrpw cntl	Prpw cntl	Colq cntl	Wibu cntl	Sunfl Yield gms	T.W. lbs./ bushl	% Moist
Trifluralin PPI	12	90	0	95	97	92	80	73	632	28	7.8
Trifl+Chlor PPI	12+24	90	0	89	95	98	89	80	719	28	8.4
Pendi+Chlor PPI	18+24	95	0	88	91	85	76	68	691	28	8.7
EPTC+Chloram PPI	40+24	95	0	83	91	50	89	64	769	28	8.1
Metolac+Chlor PPI	40+24	97	0	95	97	83	50	47	668	28	8.1
Trifl+R-40244 PPI	12+4	93	0	93	97	98	77	92	674	28	8.5
Trifl+R-40244 PPI	12+8	95	0	98	99	93	96	95	739	27	8.9
EPTC+R-40244 PPI	40+8	100	0	89	99	99	100	95	703	28	9.0
Metolac+Chlor PE	40+24	84	0	80	89	85	48	55	544	29	8.5
Metolac+R-40244 PE	40+8	88	0	88	93	90	40	33	555	28	8.5
R40244+BAS9052 PE+P	8+3	100	0	100	30	10	10	0	446	28	7.2
Trifl+Desm PPI+P	12+6	93	13	89	89	88	88	88	603	28	8.8
Trifl+Desm PPI+P	12+8	92	13	90	93	94	90	90	666	28	8.2
Trifl+Desm PPI+P	12+12	96	35	94	98	98	91	88	593	28	8.9
BAS-9052+R-40244 P	3+2	100	58	76	48	50	20	8	571	26	8.9
BAS-9052+Desmed P	3+8	100	70	50	25	20	18	0	412	26	9.4
BAS-9052+OC P	3+.25G	100	0	99	0	0	0	0	397	28	8.5
Control weed free		100	0	100	100	100	100	100	761	27	8.7
Control weedy		0	0	0	0	0	0	0	366	28	8.3
Mean		90	10	84	75	70	61	56	606	28	8.5
High mean		100	70	100	100	100	100	100	769	29	9.4
Low mean		0	0	0	0	0	0	0	366	26	7.2
Coeff. of variation		4	59	16	20	23	26	35	15	3	8.0
LSD(1 Percent)		7	11	25	28	30	30	37	169	1	1.3
LSD(5 Percent)		6	8	18	21	23	22	28	127	1	1.0
No. of reps		4	4	4	4	4	4	4	4	4	4.0

Summary

Sunflower yields generally related to weed control or injury rating. Desmedipham at 6 or 8 oz/A postemergence after trifluralin did not cause important injury to sunflower or influence seed yield. Desmedipham at 12 oz/A or when applied with BAS-9052 injured sunflower.

Weed control in sunflower, Langdon 1982. Preplant herbicides were applied and field cultivator incorporated twice, '903' sunflower seeded and preemergence herbicides applied, June 11. The soil was a clay loam with 7.4 pH and 4.1% orgnaic matter. Postemergence treatments were applied to 2 to 4 leaf sunflower and 1 inch foxtail on July 2. The weeds were mainly green foxtail with a sparse population of common lambsquarter and redroot pigweed. Crop injury and percent weed control were evaluated on July 27.

Treatment	Rate (oz/A)	July 27 -Sunflower- %ir	%sr	--Percent Control-- Grft	Colq	Rrpw
Trifluralin PPI	12	2	0	100	99	100
Trifluralin+Chloramben PPI	12+24	0	0	100	100	100
Pendimethalin+Chloramben PPI	18+24	0	0	99	100	100
EPTC+Chloramben PPI	40+24	0	0	99	100	100
Metolachlor+Chloramben PPI	40+24	0	0	100	100	100
Trifluralin+R-40244 PPI	12+4	0	0	100	100	100
Trifluralin+R-40244 PPI	12+8	0	0	100	100	100
EPTC+R-40244 PPI	40+8	0	0	99	98	98
Metolachlor+Chloramben PE	40+24	3	0	96	98	100
Metolachlor+R-40244 PE	40+8	0	0	96	99	100
R-40244+BAS-9052 PE+P	8+3	0	0	90	88	95
Trifluralin+Desmedipham PPI+P	12+6	16	0	100	100	100
Trifluralin+Desmedipham PPI+P	12+8	11	0	100	100	100
Trifluralin+Desmedipham PPI+P	12+12	20	3	100	100	100
BAS-9052+R-40244 P	3+2	9	0	91	93	98
BAS-9052+Desmedipham P	3+8	20	3	94	93	98
BAS-9052+OC P	3+.25G	0	0	93	0	0
Control weed free		0	0	98	100	100
Control weedy		0	0	0	0	0
Mean		4	0	92	88	89
High mean		20	3	100	100	100
Low mean		0	0	0	0	0
Coeff. of variation		86	622	3	4	2
LSD(1 Percent)		7	3	5	6	4
LSD(5 Percent)		5	2	4	5	3
No. of reps		4	4	4	4	4

Summary

All herbicide treatments gave excellent green foxtail (90%+) control. Desmedipham tended to injure sunflower more when applied with BAS-9052 than when applied alone. Desmedipham at 12 oz/A or at 8 oz/A with BAS-9052 caused a slight stand reduction.

Post wimu and grass weed control in sunflower, Casselton 1982. '894' hybrid sunflower was seeded in rows 30 inch apart on a silty clay with 7.9 pH and 5.5% organic matter, May 28. Herbicides were applied in 8.5 gpa at 35 psi and the oil additive (OC) at 1 qt/A was a phytobland petroleum oil with 17% emulsifier. Most herbicides were applied on June 21 to 4 leaf sunflower and 2 to 6 leaf wild mustard and yellow foxtail. Treatments S2 were on July 1 to 8 leaf, S3 on July 14 to 18 inch tall, S4 on July 26 to bud stage, and S5 on July 28 to bud stage sunflower.

Treatment	Rate (oz/A)	Yield lb/A	Sunflower %ir	Sunflower %sr	Percent Control Wimu	Percent Control Fxtl	Sept31 Colq	Sept31 Fxtl
BAS-9052+OC S 2	8+.25G	359	0	0	0	76	0	100
BAS-9052+OC S 3	8+.25G	355	0	0	0	0	0	100
BAS-9052+OC S 5	8+.25G	369	0	0	0	0	0	80
BAS-9052+OC	3+.25G	545	0	0	0	91	0	97
PP-009+OC	4+.25G	368	0	0	0	66	0	71
PP-9+OC+PP-9+OC S 4	8+.25G+8+.25G	283	5	0	0	84	0	87
PP-009	16	328	0	0	0	92	0	98
BAS-9052+R-40244+OC	3+1+.25G	609	18	0	94	91	44	95
BAS-9052+R-40244+OC	3+2+.25G	683	15	0	88	88	76	80
PP-009+R-40244+OC	4+2+.25G	592	18	0	100	79	76	50
BAS-9052+Acifluorfen+OC	3+1+.25G	512	41	0	96	94	70	92
PP-009+Acifluorfen+OC	4+1+.25G	380	50	0	98	75	80	44
BAS-9052+Desmedipham	3+8	665	28	0	98	76	90	78
PP-009+Desmedipham	4+8	415	28	0	100	73	86	60
CGA-82725+OC	4+.25G	472	3	0	0	74	0	61
Diclofop	16	307	0	0	0	53	0	36
Control weedy		228	0	0	0	0	0	0
Control weed free		895	0	0	100	100	100	97
Mean		465	11	0	43	67	35	74
High mean		895	50	0	100	100	100	100
Low mean		228	0	0	0	0	0	0
Coeff. of variation		40	39	0	8	14	38	22
LSD(1 Percent)		352	8	0	6	18	25	31
LSD(5 Percent)		264	6	0	5	13	19	23
No. of reps		4	4	4	4	4	4	4

Summary

None of the herbicides caused any sunflower stand reduction. BAS-9052 and PP-009 with acifluorfen and oil caused severe injury to sunflower. Yellow foxtail control tended to be lower with BAS-9052 or PP-009 when applied with any of the herbicides for broadleaf weeds than when applied alone. The rainfall for 10 days after the June 21 treatments was 0.05 inch on June 23. BAS-9052 at 8 oz/A applied on July 28 (S5) only gave 80% yellow foxtail control compared to 100% with earlier applications. The results of the experiment indicate potential for the control of both yellow foxtail and wild mustard with postemergence herbidides.

Postemergence wimu control in sunflower, Casselton 1982. '894' sunflower was seeded after trifluralin at 1 lb/A was preplant field cultivator incorporated on May 28. S1 treatments were applied to four leaf sunflower and two to six leaf wild mustard on June 22. S2 treatments were applied to six to eight leaf sunflower and two to six leaf wild mustard on June 29. Harvest was on Oct 25.

		Sunflower						
						Hght	-% control-	
	Rate	Yield	7-9	7-27	7-9	reduc	7-9	7-27
Treatment	(oz/A)	lb/A	%ir	%ir	%sr	in.	Wimu	Wimu
Desmedipham+OC S1	4+.25G	1382	19	15	0	6	78	68
Desmedipham+LOTM S1	4+.25G	1086	16	15	0	3	63	48
Desmedipham+SFTM S1	4+.25G	1285	20	24	0	6	61	60
Desmedipham S1	4	1251	15	10	0	5	75	57
Desmedipham S1	6	1287	18	11	3	3	89	84
Desmedipham S1	8	1304	20	14	4	1	95	91
Desmedipham S1	12	1289	26	28	8	7	99	97
Desmedipham+SFTM S1	12+.25G	1079	48	35	3	6	94	86
Benazolin S1	10	1129	21	6	0	3	76	87
Benazolin S1	20	1032	39	36	0	8	95	99
Bifenox S1	16	1332	0	0	0	1	20	8
Bifenox S1	24	1305	1	0	0	2	46	26
Acifluorfen S1	0.5	1319	0	3	0	4	25	26
Acifluorfen S1	1.0	1504	3	1	0	1	68	64
Acifluorfen S1	2.0	1298	10	5	0	5	94	85
R-40244 S1	1.0	1303	16	5	0	5	93	97
R-40244 S1	2.0	1202	23	16	0	4	100	99
SN-55048 S1	8	1211	30	26	13	5	97	96
SN-83209 S1	8	1222	16	11	0	4	98	99
Desmedipham S2	8	1210	28	24	0	6	79	77
Desmedipham S2	12	1118	33	33	0	4	82	83
Desmedipham S2	16	1178	33	35	5	8	90	87
Benazolin S2	20	994	6	21	0	3	89	99
Bifenox S2	24	972	5	10	0	4	5	11
Acifluorfen S2	1	847	8	13	0	3	61	70
Acifluorfen S2	2.0	1013	16	14	0	4	88	84
R-40244 S2	2.0	981	30	17	0	3	93	95
Control weedy		1226	0	0	0	2	0	0
Control weed free		1361	0	0	0	6	100	98
Mean		1197	17	15	1	4	74	72
High mean		1504	48	36	13	8	100	99
Low mean		847	0	0	0	1	0	0
Coeff. of variation		19	36	51	280	61	14	15
LSD(1 Percent)		426	11	14	6	5	19	20
LSD(5 Percent)		322	9	11	5	3	14	15
No. of reps		4	4	4	4	4	4	4

Summary

Oil additives to desmedipham increased injury to sunflower without a corresponding increase in wild mustard control. Desmedipham gave higher wild mustard control when applied at the S1 than at S2 when plants were larger. Acifluorfen at 2 oz/A gave 80% or more wild mustard control at the S1 or S2 stage of application. SN-83209 appeared more efficacious than desmedipham for wild mustard control in sunflower. Benazolin or R-40244 both gave good wild mustard control with possibly acceptable injury to sunflower.

Postemergence wimu control in sunflower, Fargo 1982. '894' hybrid sunflower was seeded on May 22. PP-009 at 0.25 lb/A was applied for grass weed control to the entire plot area on June 21. S1 treatments were applied to four to eight leaf sunflower, 1 to 3 in. wild mustard and 2 to 6 in. kochia on June 25. S2 treatments were to six to eight leaf sunflower, 2 to 8 leaf wild mustard, and 2 to 7 in. kochia on July 1. Sunflower were not harvested because of bird damage and wind breakage.

Treatment	Rate oz/A	--Sunflower-- %ir	%sr	--% Control-- Wimu	Kocz
Desmedipham+OC S1	4+.25G	31	0	92	13
Desmedipham+LOTM S1	4+.25G	24	0	93	25
Desmedipham+SFTM S1	4+.25G	24	0	86	10
Desmedipham S1	4	3	0	79	15
Desmedipham S1	6	14	0	95	30
Desmedipham S1	8	14	0	99	40
Desmedipham S1	12	33	0	100	30
Desmedipham+SFTM S1	12+.25G	39	0	96	33
Benazolin S1	10	16	0	96	96
Benazolin S1	20	14	0	99	100
Bifenox S1	16	5	0	59	21
Bifenox S1	24	9	0	71	42
Acifluorfen S1	0.5	0	0	30	0
Acifluorfen S1	1.0	1	0	83	0
Acifluorfen S1	2.0	10	0	90	17
R-40244 S1	1.0	19	0	96	63
R-40244 S1	2.0	21	0	100	69
SN-55048 S1	8	23	0	98	44
SN-83209 S1	8	15	0	96	33
Desmedipham S2	8	20	0	95	44
Desmedipham S2	12	18	0	93	40
Desmedipham S2	16	23	0	96	40
Benazolin S2	20	13	0	95	96
Bifenox S2	24	13	0	66	10
Acifluorfen S2	1	9	0	83	39
Acifluorfen S2	2.0	15	0	94	34
R-40244 S2	2.0	19	0	99	78
Control weedy		0	0	0	0
Control weed free		0	0	100	100
Mean		15	0	85	40
High mean		39	0	100	100
Low mean		0	0	0	0
Coeff. of variation		51	0	10	55
LSD(1 Percent)		14	0	16	41
LSD(5 Percent)		11	0	12	31
No. of reps		4	4	4	4

Summary

Oil additives enhanced wild mustard control and sunflower injury from desmedipham. Desmedipham applied at 6 oz/A (S1) and 8 oz/A (S2) gave more than 90% wild mustard control. SN-83209 tended to cause less injury to sunflower than desmedipham. Benazolin controlled kochia and wild mustard with only moderate injury to sunflower. Acifluorfen at 2 oz/A gave 90%+ wild mustard control at both stages of treatment.

Directed desmedipham in sunflower, Fargo 1982. 894 hybrid sunflower in the 4 leaf and wild mustard in the 2 to 4 leaf stage were treated with desmedipham applied by various methods (S1). The second (S2) treatments were applied to 8 leaf sunflowers and wild mustard beginning to flower, July 8.

Treatment	Rate lb/A	-----Sunflower----- %ir	%sr	% Control Wimu
Desmedipham sheild S1	.5	0	0	80
Desmedipham sheild S1	1.0	5	0	93
Desmedipham sheild S1	2.0	5	0	98
Desmedipham band S1	.5	53	20	95
Desmedipham band S1	1.0	60	30	100
Desmedipham band S1	2.0	90	93	100
Desmedipham broadcast S1	.5	18	0	95
Desmedipham broadcast S1	1.0	28	3	100
Desmedipham broadcast S1	2.0	50	10	100
Desmedipham sheild S2	.5	0	0	28
Desmedipham sheild S2	1.0	0	0	58
Desmedipham sheild S2	2.0	0	0	68
Desmedipham band S2	.5	14	0	45
Desmedipham band S2	1.0	28	0	80
Desmedipham band S2	2.0	40	0	93
Desmedipham broadcast S2	.5	5	0	45
Desmedipham broadcast S2	1.0	20	0	85
Desmedipham broadcast S2	2.0	28	0	86
Control		0	0	0
Mean		23	8	76
High mean		90	93	100
Low mean		0	0	0
Coeff. of variation		43	134	12
LSD(1 Percent)		28	32	26
LSD(5 Percent)		21	23	19
No. of reps		2	2	2

Summary

Desmidipham applied as a band over the row from two nozzle caused more injury to sunflower than when broadcast applied. Injury was reduced when desmedipham was applied as a band by two nozzles to the base of each plot of sunflowers which were shielded. Wild mustard control by desmidipham was higher at the early than the late stage of application and was less for the shielded treatment than the band or broadcast treatment at the second stage of application.

Desmedipham time of day for wimu control in sunflower, Fargo 1982. 894 sunflower was seeded on May 22. PP-009 at 4 oz/A was applied to the entire experiment to control grass weeds. Desmedipham was applied to 6 leaf sunflower and 6 to 10 inch wild mustard at 8:00 am (55F, 78% RH, 5 mph N wind, sunny), at 2:00 pm (67 F, 60% RH, 10 mph wind, cloudy), and at 8:00 pm (60 F, 60% RH, 5 mph wind and sunny) on June 29.

Treatment	Rate oz/A	Sunflower %ir	Percent Control Wimu
Desmedipham 8 AM	8	17	97
Desmedipham 8 AM	12	32	100
Desmedipham 8 AM	24	23	99
Desmedipham 2 PM	8	17	97
Desmedipham 2 PM	12	25	100
Desmedipham 2 PM	24	34	100
Desmedipham 8 PM	8	15	98
Desmedipham 8 PM	12	22	100
Desmedipham 8 PM	24	28	100
Control weedy	.	0	0
Control weed free (2 rows)	.	0	0
Mean		19	81
High mean		34	100
Low mean		0	0
Coeff. of variation		30	2
LSD(1 Percent)		13	3
LSD(5 Percent)		10	2
No. of reps		3	3

Summary

Wild mustard was controlled regardless of time of desmedipham application and injury to sunflower was smaller at all times of desmedipham application.

Desmedipham time of day for wimu control in sunflower, Casselton 1982. '894' sunflower was seeded on May 28 after the area was treated with trifluralin at 1 lb/A and field cultivator incorporated. Treatments were applied to 4 leaf sunflower and 2 to 5 leaf wild mustard, June 22. The temperatures at treatment were: 65F at 8 AM, 76F at 2 PM, and 50F at 8 PM.

Treatment	Rate oz/A	-----Sunflower----- %ir	%sr	% Control Wimu
Desmedipham 8 AM	8	16	0	73
Desmedipham 8 AM	12	23	0	89
Desmedipham 8 AM	24	33	0	97
Desmedipham 2 PM	8	19	0	85
Desmedipham 2 PM	12	24	3	93
Desmedipham 2 PM	24	35	6	100
Desmedipham 8 PM	8	16	4	85
Desmedipham 8 PM	12	23	0	83
Desmedipham 8 PM	24	29	3	95
Control weedy	.	0	0	0
Control weed free (2 rows)	.	0	0	100
Mean		20	1	82
High mean		35	6	100
Low mean		0	0	0
Coeff. of variation		26	253	7
LSD(1 Percent)		10	7	12
LSD(5 Percent)		7	5	9
No. of reps		4	4	4

Summary

Desmedipham injury to sunflower and control of wild mustard was similar regardless of the time of treatment. Wild mustard control tended to be higher when desmedipham was applied at 2:00 PM than at 8:00 AM or 8:00 PM.

Weed control in corn, Casselton 1982. PPI treatments applied and incorporated Agsco 2xAI corn seeded and PE treatments applied on May 28. Dicamba-CN104359 was applied on June 4 when weeds were colyledenory or one leaf and corn had not emerged. Post treatments were applied to 4 leaf corn, 2 to 3 leaf grass and 1 to 3 inch broadleaf weeds on June 17. Evaluations were on June 30.

Treatment	Rate lb/A	-----Corn---- %ir	%sr	--% Control-- Yeft	Wimu
EPTC&R PPI	4	0	1	93	64
EPTC&R&Ext PPI	4	0	0	97	78
Butylate&R+Cyanazine-L PPI	4+2	0	0	71	91
PPG1294 (EPTC&PPG1292)	4	0	0	96	66
PPG1295 (Butylate&PPG1292)	4	0	0	78	15
Cyanazine-L PPI	4	0	0	76	98
Cyanazine-L+Atrazine-L PPI	2.5+1.5	0	0	95	99
Alachlor+Cyanazine-L PPI	2.5+2.5	0	1	84	94
Metolachlor+Cyanazine-L PPI	2.5+2.5	0	0	88	96
Propachlor PE	5	0	0	78	10
Alachlor PE	3	0	0	84	20
Metolachlor PE	3	0	0	55	6
Alachlor+Cyanazine-L	2.5+2.5	0	0	86	94
Metolachlor+Cyanazine-L PE	2.5+2.5	0	0	75	87
Alachlor+Dicamba PE	2.5+.5	0	0	87	91
Alachlor+Dicamba-CN PE	2.5+.5	0	3	87	97
Alachlor+Dicamba-CN PE	2.5+.75	0	3	92	100
Acetochlor+Cyanazine-L PE	1.75+2.5	0	0	91	97
Pendimethalin PE	2	1	0	73	73
Pendimethalin+Cyanazine-L PE	1.5+2.5	0	0	81	93
Pend+Cyanazine-W Spike	1.5+2.5	2	0	74	100
Atrazine-L+LOTM Post	1.5+.25G	1	0	80	100
Cyanazine-W+LOTM Post	1.5+.25G	2	3	61	100
EPTC&R+Dicamba PPI+Post	4+.5	0	0	98	100
EPTC&R+Cyanazine-L PPI	3+2	0	0	96	97
Butylate&R+Cyanazine-L PPI	3+2	0	1	78	96
Alachlor+Linuron PE	2.5+1	0	0	83	91
EPTC&R+Cyanazine-L PPI	4+2	0	0	98	96
Atra-L+Dowco-356+LOTM Post	.5+.5+.25G	1	0	69	99
Atra-L+Dowco-356+LOTM Pos	1.5+.5+.25G	0	0	83	99
Cyan-W+Dowco-356+LOTM Pos	1.5+.5+.25G	3	3	74	99
Control		0	0	0	0
Mean		0	0	80	79
High mean		3	3	98	100
Low mean		0	0	0	0
Coeff. of variation		172	420	10	7
LSD(1 Percent)		1	3	15	11
LSD(5 Percent)		1	3	11	8
No. of reps		4	4	4	4

Summary

Foxtail control varied from 55% with metalachlor alone to 98% with EPTC plus postemergence dicamba or when combined with cyanazine. Dowro 356 did not enhance foxtail control with atrazine or cyanazine postemergence. The 1982 results differed in various aspects from those of previous years-see table.

Weed control in corn, Lenz Farm Barney 1982. PPI treatments applied and roto tiller incorporated, May 4. Pioneer 3780 corn was seeded on May 5 and pre-emergence treatments applied on May 6. Rainfall was 0.3 inch on May 9 and 0.6 inch on May 13. Postemergence treatments were applied to 4 leaf corn, 2 to 3 leaf grass weeds, and 1 to 3 inch broadleaf weeds on June 17. Late postemergence trifluralin and pendimethalin were applied on June 29 to the last two EPTC+R treatments, but a hail storm occurred before evaluation was possble. Evaluation of other treatments was on June 28.

Treatment	Rate oz/A	Corn %ir	------Percent Control------ Wrpm	Fxtl	Rrpw	Colq	Wimu
EPTC+R+Ext PPI	80	1	78	88	74	88	34
EPTC+R PPI	80	0	46	76	45	74	43
Butylate+R PPI	80	1	55	88	66	39	44
EPTC+R+Cyanazine L PPI	64+32	0	50	69	65	90	85
Alachlor PPI	48	0	73	85	90	86	45
Metalochlor PPI	48	0	66	83	76	80	45
EPTC+R+Alachlor PPI+PE	64+32	0	81	96	89	94	63
EPTC+R+Pendimethalin PPI+PE	64+32	0	73	79	91	94	66
Alachlor+Pend. PPI+E.Post	48+24	1	88	90	95	94	70
Pendimethalin+Cyanazine L PE	32+40	1	90	90	91	94	94
Acetochlor PE	32	2	94	95	94	93	94
EPTC+R+CYAN 80+oil PPI+E.Post	64+24	4	88	91	95	95	95
EPTC+R+CYAN 80+Pend. PPI+E.Post	64+24+24	3	91	90	95	95	95
Cyanazine 80W+Pend PE+E.Post	40+24	5	89	89	95	93	91
Alachlor+Cyanazine L. PE	40+40	0	83	94	95	94	94
EPTC+R+Trif PPI + L. Post Inc.	64+12	0	36	41	25	36	36
EPTC+Pend PPI + L. Post Inc.	64+16	0	51	59	65	48	21
Control		0	0	0	0	0	0
Mean		1	68	78	75	77	62
High mean		5	94	96	95	95	95
Low mean		0	0	0	0	0	0
Coeff. of variation		69	18	16	18	16	31
LSD(1 Percent)		1	23	23	25	23	36
LSD(5 Percent)		1	17	17	19	17	27
No. of reps		4	4	4	4	4	4

Summary

EPTC+R-25788 with R-33865 gave higher wild proso millet control than EPTC +R-25788 alone and also tended to give higher control of other weeds. Generally combinations of herbicides were needed for more than 80% wild proso millet control, as well as for control of both broadleaf and grass weeds.

Preplant incorportated herbicides in Navy and Soybean, Fargo 1982. Treatments applied and soil incorporated by two passes with a field cultivator with attached harrow and Evans soybean and Fleetwood navybean were seeded,May 24. The soil was lumpy and a light drizzle occurred at the time of treatment.

Treatment	Rate lb/A	Soybeans %ir	Soybeans %sr	--Navy-- %ir	--Navy-- %sr	--Percent Control-- Yeft	Wimu	Rrpw	Colq
Trifluralin	1	0	0	3	0	99	0	98	100
Ethafluralin	.94	0	0	0	0	99	17	100	100
Ethafluralin	1.31	0	0	0	0	99	55	100	100
Pendimethalin	1.5	0	0	2	0	97	17	100	99
DPX-A5967	.125	0	0	5	0	71	100	100	88
DPX-A5969	.125	0	0	53	0	57	97	100	80
Metolachlor	3	0	0	0	0	75	23	90	88
Metolachlor+Trifluralin	2+.75	0	0	0	0	96	7	98	100
Trifluralin+Metribuzin-W	1+.125	0	0	3	0	98	78	100	99
Trifluralin+Metribuzin-W	1+.25	0	0	3	2	98	81	100	100
SD-95481+Metribuzin-W	.25+.25	0	0	2	0	74	90	95	98
SD-96638+Metribuzin-W	.25+.25	0	0	2	0	95	88	98	96
Trifluralin+EPTC	.5+2	20	0	0	0	93	7	98	100
Trif+EPTC&R-33865	.5+2	17	0	0	0	94	15	100	98
EPTC	2	10	0	0	0	58	0	0	23
EPTC	3	38	0	5	0	70	40	37	47
EPTC&R-33865	2	12	0	0	0	43	37	57	82
EPTC&R-33865	3	45	0	0	0	62	28	87	93
EPTC+R-40244	3+.5	60	0	19	0	78	82	92	92
EPTC+Pendimethalin	2+1.12	40	0	0	0	95	37	98	98
EPTC+Chloramben	2+1.5	18	0	0	0	90	81	100	98
EPTC+Meto+Chloramben	1.75+2+1.5	15	0	0	0	91	89	98	100
EPTC+Meto+Clam	2.5+3+3	35	0	7	0	96	97	99	100
Chloramben+Trifluralin	1.5+.75	0	0	0	0	97	95	100	100
Clam+Trif	3+1	0	0	15	0	99	97	100	100
Chloramben+Trif PE+PPI	3+1	0	0	0	0	100	97	100	100
Chloramben+Pendimethalin	1.5+1	0	0	0	0	98	98	100	99
Chloramben+Pendimethalin	3+1.5	2	0	3	0	99	97	100	100
Chloramben+Metolachlor	1.5+2	0	0	0	0	87	86	97	97
Chloramben+Metolachlor	3+3	10	0	10	0	98	99	100	100
Alachlor	3	0	0	0	0	82	47	90	80
MON-097	1.75	0	0	0	0	94	83	98	100
CGA-82725	.5	0	0	0	0	54	0	0	0
Chloramben	1.5	0	0	0	0	73	93	100	98
Control Weedy		0	0	0	0	0	0	0	0
Control Weed free		0	0	0	0	0	0	0	0
Mean		9	0	4	0	81	57	84	85
High mean		60	0	53	2	100	100	100	100
Low mean		0	0	0	0	0	0	0	0
Coeff. of variation		68	0	136	1039	7	31	12	13
LSD(1 Percent)		13	0	11	1	13	38	22	23
LSD(5 Percent)		10	0	8	1	9	29	17	17
No. of reps		3	3	3	3	3	3	3	3

Summary

Chloramben in combination with herbicides effective for grass weed control gave good broadspectrum weed control. DPX-A5969, R-40244, and chloramben at 3 lb/A in some mixtures caused moderate soybean injury.

Preemergence weed control in beans, Fargo 1982. Evans soybean and Fleetwood navybeans were seeded and preemergence herbicides applied, May 24. The soil was lumpy and a slight drizzle occurred at treatment.

Treatment	Rate lb/A	Soybeans		--Navy--		--Percent Control--			
		%ir	%sr	%ir	%sr	Yeft	Wimu	Prpw	Colq
MON-097	1.75	0	0	0	0	76	59	78	78
Chloramben	2	0	0	0	0	65	93	97	95
Chloramben-W	1.8	0	0	0	0	62	93	96	98
Metolachlor	3	0	0	0	0	43	9	41	53
Alachlor	3	0	0	0	0	61	39	80	80
DPX-A5967	.125	0	0	3	0	34	96	69	80
DPX-A5967	.25	0	0	0	0	68	100	93	98
DPX-A5969	.125	0	0	28	0	45	100	100	93
DPX-A5969	.25	0	0	58	0	74	100	100	100
Pendimethalin	1.5	0	0	0	0	58	34	74	88
Chloramben+Metolachlor	2+2	0	0	0	0	88	96	95	90
Clam+Meto	3+3	0	0	0	0	85	95	99	93
Chloramben+Pendimethalin	2+1	0	0	0	0	85	95	98	100
Clam+Pend	3+1.5	0	0	0	0	89	98	99	100
RH-8817	.38	3	0	3	0	38	58	60	20
RH-8817	.62	15	0	4	0	48	68	71	55
Control Weedy		0	0	0	0	0	0	0	0
Control Weed free		0	0	0	0	0	0	0	0
Mean		1	0	5	0	56	68	75	73
High mean		15	0	58	0	89	100	100	100
Low mean		0	0	0	0	0	0	0	0
Coeff. of variation		730	0	61	0	19	19	20	17
LSD(1 Percent)		13	0	6	0	20	25	27	36
LSD(5 Percent)		10	0	4	0	15	19	21	26
No. of reps		4	4	4	4	4	4	4	2

Summary

Treatments containing chloramben gave good broadleaf weed control. DPX-A5969 gave good broadleaf weed control without injury to soybeans.

Postemergence weed control in bean, Fargo 1982. Evans soybean and Fleetwood navybean were seeded and preemergengence treatments applied, May 24. Most treatments were applied on June 29 to two trifolialate beans, 2 to 3 inch foxtail, canada thistle 2 to 12 inches, and other weeds less than 3 inches tall. 60dPH treatment applied to 4 to 7 trifolialate beans on July 14, 10D was to 3 to 4 trifolialate beans on July 10, and Broadleaf (Bentogon at 12 oz/A+Acifluorfen at 2 oz/A) was on July 14 followed by Bas 9052 at previous rate on July 20. Wild mustard population was variable. G= gallons petroleum oil with 17% surf.

Treatment	Rate oz/A	Soybeans %ir	Soybeans %sr	--Navy-- %ir	--Navy-- %sr	--Percent Control-- Yeft	Rrpw	Wimu	Cath
BAS-9052+OC	3+.25G	0	0	0	0	98	0	0	0
PP-009+OC	4+.25G	0	0	0	0	95	0	0	0
PP-009+OC	8+.25G	0	0	0	0	90	0	0	0
PP009+OC+PP009+OC P+60dPH	8+8	0	0	0	0	96	0	0	0
PP-009+OC	32+.25G	0	0	0	0	100	0	0	0
PP-009+Acifluorfen RP	4+6	0	0	0	0	68	87	96	35
PP-009+Acifluorfen RH	4+6	2	0	8	23	47	100	100	63
PP-009+Acifluorfen RH+OC	4+6+.25G	3	0	10	0	89	95	100	63
BAS-9052+Acifluorfen RH	3+6	0	0	3	0	70	95	100	63
Trif+Napt&Dino PPI+P+10D	16+12+6	0	0	15	0	87	87	95	18
DPX-A5969	0.25	0	0	73	0	75	98	100	80
DPX-A5969	0.12	0	0	83	0	85	100	100	87
DPX-A5969+Citowett	0.25+.2%	0	0	90	0	87	100	100	78
BAS-9052+BAS-506H PE+P	16+9	0	0	3	0	96	70	100	27
BAS-9052+BAS-506H PE+P (Resid)	16+13	0	0	2	0	98	88	100	38
BAS-9052+BAS-506H PE+P	16+18	3	0	13	0	96	90	97	41
BAS-90+BAS-50+0 PE+P (RE)	16+13+.25G	0	0	0	0	99	92	100	40
BAS-9052+Bentazon PE+P	16+12	0	0	0	0	97	48	100	42
BAS-9052+Bentazon+OC PE+P	16+12+.25G	0	0	0	0	98	83	100	40
BAS-9052+Acifluorfen PE+P	16+8	0	0	5	0	98	88	100	73
BAS-9052+OC	1.5+.25G	0	0	0	0	95	23	53	3
BAS-9052+OC (2-7D)+Broadleaf	2.4+.25G	0	0	0	0	97	0	0	0
BAS-9052+OC (2-7D)+Broadleaf	3+.25G	0	0	0	0	100	0	0	0
Acifluorfen RH	2	0	0	5	0	0	85	100	28
Acifluorfen RH	4	0	0	3	0	0	87	100	57
Acifluorfen RH	8	0	0	7	0	0	93	100	58
Acifluorfen RP	8	0	0	10	0	0	85	100	57
PPG844+S (X77)	2.4+.25%	5	0	13	0	0	88	100	10
PPG844+S (X77)	3.2+.25%	3	0	17	0	0	87	95	12
PPG844	3.2	3	0	13	0	0	87	98	17
Desmedipham	12	3	0	17	0	0	80	100	0
Dinoseb	12	0	0	11	0	0	67	97	10
Control Weedy		0	0	0	0	0	0	0	0
Control Weedfree		0	0	0	0	100	100	100	100
Mean		1	0	12	1	64	65	74	34
High mean		5	0	90	23	100	100	100	100
Low mean		0	0	0	0	0	0	0	0
Coeff. of variation		352	0	57	1010	14	19	11	22
LSD(1 Percent)		5	0	14	15	18	27	18	16
LSD(5 Percent)		4	0	11	11	14	20	13	12
No. of reps		3	3	3	3	3	3	3	3

Summary

Bas 9052 at 1.5 oz/A with oil gave parcial control of broadleaf weeds in two of the three replications which may have been variable rating because of ununiform population or spray contamination. Wild mustard was controlled with acifluorfen at 2 oz/A

Comparison of dinitroanilines for weed control in navy beans, NW 22 Fargo 1982. Preplant incorporated treatments (PPI) were applied to a silty clay loam soil with a pH of 7.5 and 6% organic matter and twice incorporated with a field cultivator plus harrow on June 1. 'Fleetwood' navy beans were seeded the same day. Herbicides were applied in 17 gpa at 40 psi to a 7 ft. strip the length of the 10 by 30 ft. plots. The first after treatment rains of 0.47 inch occurred on June 6. Navy bean injury and weed control were evaluated on June 29 and July 15.

		---- June 29 eval ----				---- July 15 eval ----			
Treatment	Rate lb/a	Navy beans %ir	Wimu ---%	Kocz control---	Yeft	Navy beans %ir	Wimu ---%	Kocz control---	Yeft
Trifluralin	1.0	0	12	99	99	0	10	98	98
Ethafluralin	0.94	0	52	100	98	1	53	100	98
Pendimethalin	1.5	3	22	100	97	0	17	98	94
Fluchloralin	1.25	0	42	100	96	1	23	97	94
Trifluralin+Chloramben	1+1.5	0	96	100	100	0	87	100	97
Ethafluralin+Chloramben	0.94+1.5	0	97	100	99	0	88	100	97
Pendimethalin+Chloramben	1.5+1.5	3	96	100	98	0	90	100	98
Fluchloralin+Chloramben	1.25+1.5	0	94	100	100	0	87	99	98
Control weedy		0	0	0	0	0	0	0	0
Control weed free		0	100	100	100	0	100	100	100
Mean		1	61	90	89	0	56	89	87
High mean		3	100	100	100	1	100	100	100
Low mean		0	0	0	0	0	0	0	0
Coeff. of variation		199	23	0	2	398	21	1	3
LSD(1 Percent)		3	33	1	5	2	27	2	5
LSD(5 Percent)		2	24	1	3	1	20	2	4
No. of reps		3	3	3	3	3	3	3	3

Summary

All dinitroaniline (DNA) herbicides and DNA-chloramben combinations tested gave good control of yellow foxtail (heavy infestation) and kochia(light to moderate infestation). At the late (7/15) evaluation, wild mustard (moderate infestation)control was better with ethafluralin than with the other DNAs tested, but DNA-chloramben combinations were necessary for acceptable wild mustard control. DNA-chloramben combinations gave 87-90% wild mustard control at the late evaluation.

Species response to postemergence herbicides, Casselton 1982. Era wheat, Park barley, Mamoth oats, 894 sunflower, G4171 corn, Bush Mamofort sugarbeet, Culbert flax, Evans soybeans, Fleetwood navybean and VI-111 pinto bean were seeded on May 28. S1 treatments were to 5 to 6 leaf wheat, oats, and barley; 4 to 6 leaf sugarbeet, 3 inch flax; 1 to 2 trifolialate beans; 6 inch corn; 4 leaf sunflower; 1 to 2 inch kochia and foxtail; and 2 to 4 inch wild mustard and common lamlsquarters on June 24. S2 treatments were to flowering weeds and approximately 12 inch tall crops on July 14. Surf = WK at 0.25% v/v and oil was petrolum oil with 17% emulsifer applied at 1 quart/A.

	Rate	--------July 27 Evaluation--------						---Percent Control---			
Treatment	oz/A	Wheat	Flax	DBean	SBean	Corn	Sofl	Wimu	Colq	Kocz	Rrpw
NAPT+DINO S1	18+8	8	8	7	0	20	43	99	0	7	13
NAPT+DINO S1	32+16	8	12	28	7	7	58	99	0	13	43
NAPT+2,4-DB S1	24+3	0	0	30	15	15	53	7	48	18	28
NAPT+DINO S2	16+8	3	7	22	13	33	60	37	0	0	20
NAPT+DINO S2	32+16	22	37	35	22	43	73	70	17	0	47
Bentazon S2	12	0	3	2	0	7	38	58	2	13	10
Bentazon+Oil S2	12	0	0	8	2	8	43	70	15	13	8
Acfluorfen RH S2	3	15	23	40	13	33	37	50	0	20	20
Mean		7	11	21	9	21	51	61	10	11	24
High mean		22	37	40	22	43	73	99	48	20	47
Low mean		0	0	2	0	7	37	7	0	0	8
Coeff. of variation		89	100	40	98	56	27	11	97	117	79
LSD(1 Percent)		15	27	21	21	28	33	16	24	30	45
LSD(5 Percent)		11	20	15	15	20	24	12	17	22	33
No. of reps		3	3	3	3	3	3	3	3	3	3

Summary

Data only presented for wheat which was representative of the small grains. Foxtail was not controlled by any treatment (data not presented). Interpsecies competition may have influenced control evaluations. Redroot pigweed control appeared low where species canopy may have prevented contact with the herbicide spray. Bentazon applied at S2 burned wild mustard leaves, but seed pods developed; while acifluorfen did not burn the leaves, but appeared to prevent seed pod development. Observation indicated that wild buckswheat was controlled by Naptalam with 2,4-DB.

Fall applied herbicides in safflower, Williston 1982. Herbicides were applied to a loam soil with 2.1% organic matter and incorporated once with a Glenco on October 19, 1981 with 63F, 40% RH and a 13 mph west wind. The seedbed was tilled 3 inches deep with a Glenco and Hortman safflower seeded at 30 lb/A 1.5 inches deep in rows spaced 12 inches apart, May 21, 1982. The experiment was a random-complete block with 8 by 25 ft plots of which 82.7 sq ft were harvested on Sept. 21. The experiment was on 1981 fallowed soil fertilized at 45 lb/A of N. Green-foxtail and wild oats densities were medium, wild mustard and redroot pigweed light, and Russian thistle heavy.

		----Safflower----			------Percent Control------				
Treatment	Rate lb/A	TW lb/bu	Yield lb/A	%sr	Grft	Wioa	Wimu	Rrpw	Ruth
EPTC PPI	3.0	42.4	1016	0	39	31	0	0	0
Trifluralin PPI	0.75	43.0	1429	1	96	90	0	96	85
Trifluralin PPI	1.0	42.3	1521	0	98	95	6	98	95
Pendimethalin PPI	0.75	42.4	1364	0	95	83	0	94	51
Pendimethalin PPI	1.0	42.1	1328	0	95	89	8	94	69
Pendimethalin PPI	1.5	41.9	1543	0	98	94	25	98	78
Trifluralin+Triallate	1+1	42.4	1597	0	98	98	0	96	91
Pendimethalin+Triallate PPI	1+1	41.4	1409	0	97	100	0	95	66
Ethelfloralin PPI	1.0	42.7	1621	1	98	95	33	99	96
Control		41.4	917	0	0	0	0	0	0
Mean		42.2	1375	0	81	77	7	77	63
High Mean		43.0	1621	1	98	100	33	99	96
Low Mean		41.4	917	0	0	0	0	0	0
Coeff. of variation			14	438	6	7	174	2	15
LSD (1 Percent)			369	2	9	10	24	3	19
LSD (5 Percent)			273	1	7	7	18	2	14
No. of Reps			4	4	4	4	4	4	4

Summary

None of the herbicides caused any visable injury to safflower. All herbicides except EPTC gave 80% or higher control of green foxtail, wild oats, and redroot pigweed. Russian thistle was controlled more by treaments with trifluralin than with pendimethalin or EPTC. Safflower yields generally related directly to weed control. Ethalfloralin caused a 703 lb/A safflower seed yield increase compared to untreated safflower.

Preemergence weed control in safflower, Williston 1982. PPI treatments were applied to a damp soil and incorporated once with a triple K and once with a Glenco at a right angle to the triple K direction, May 20. 'Hortman' safflower was seeded 2 inches deep in rows spaced one foot apart in 1981 fallowed loam soil with 2.1% organic matter and fertilized with 45 lb/A N and PE treatments applied to a dry soil surface, May 21. Green foxtail and wild oats infestation was medium, wild mustard and volunteer grain light, and Russian thistle heavy. Plots were 8 by 25 feet and 85.5 sq ft were harvested for yield on September 21.

		---Safflower---			---Percent Control---				
Treatment	Rate lb/A	TWlb/bu	Yield lb/A	%sr	%ir	Grft	Wioa	WimuRuth	Vogr
Trifluralin PPI	.75	41.7	1399	0	0	95	92	0 73	53
Trifluralin PPI	1.00	41.6	1439	0	0	99	95	0 78	50
EPTC PPI	3.0	42.3	1328	0	0	96	98	23 10	77
Pendimethalin PPI	0.75	41.4	1200	0	0	90	68	0 25	55
Pendimethalin PPI	1.0	42.2	1413	0	0	95	90	0 67	53
Trifluralin+Triallate PPI	.75+1.0	42.6	1416	2	0	98	100	0 85	47
Pendimethalin+Triallate PPI	.75+1.0	41.1	1393	0	0	95	98	0 55	50
Ethalfloralin PPI	1.0	41.5	1513	0	0	99	96	22 90	77
R-40244 PPI	0.25	42.5	1106	0	3	32	17	85 17	0
R-40244 PPI	0.5	41.5	1194	3	0	58	30	96 23	47
Chlorsulfuron PPI	0.25	43.8	807	48	30	83	45	100 98	23
Ethalfloralin PE	1.0	42.3	1036	0	0	62	33	0 70	17
Pendimethalin PE	1.0	41.9	1157	0	0	70	25	0 37	0
Pendimethalin PE	1.5	42.0	1293	0	3	73	40	10 47	7
Chlorsulfuron PE	0.167	43.0	1080	37	8	82	50	98 92	0
Chlorsulfuron PE	0.25	43.4	1080	40	13	70	67	100 90	0
Chlorsulfuron PE	0.5	41.7	924	62	18	90	58	100 95	30
Chlorsulfuron PE	0.75	43.1	1085	57	27	95	45	100 95	37
Pendimethalin+Chlorsulfuron PE	.75+.25	44.1	1071	45	5	94	45	100 93	17
Pendimethalin+R-40244 PE	1.0+.25	43.2	1272	0	0	85	27	100 67	0
Pendimethalin+R-40244 PE	1.0+.5	42.1	1303	2	2	90	50	90 38	0
Control		41.7	1031	0	0	0	0	0 0	0
Mean		42.3	1206	13	5	80	58	47 61	29
High Mean		44.1	1513	62	30	99	100	100 98	77
Low Mean		41.1	807	0	0	0	0	0 0	0
Coeff. of Variation			13	92	200	16	36	16 29	88
LSD (1 Percent)			354	27	22	29	46	16 39	56
LSD (5 Percent)			265	21	16	21	35	12 29	42

Summary

Safflower stand was reduced by chlorsulfuron at all rates or methods of application. R-40244 at 0.25 or 0.5 lb/A controlled wild mustard, but not Russian thistle. Triallate and dinitroanilines preplant incorporated controlled the wild oats which was seeded to the plots. Ethalfluralin tend to give higher Russian thistle control than trifluralin which gave higher control then pendimethalin. Grass weeds were generally controlled better with preplant incorporated than preemergence herbicide treatments.

Postemergence weed control in safflower, Williston 1982. 'Hartman' safflower was seeded 2 inch deep in 12 inch spaced rows to a 2.1% organic matter loam soil fallowed in 1981 and fertilized with 45 lb N/A, May 21. Hercicides were applied to 5 to 11 leaf safflower, to a medium density of 2 to 4 leaf green foxtail and 4 leaf wild oats, to a low density of 2 inch wild mustard and 3 leaf volunteer grain, and to a high density of ½2 inch Russian thistle on June 18 with 62F, 65% RH, and calm. The experiment was a randomized complete block with 8 by 25 foot plots. Harvest was from a 85.5 sq ft area on September 21. OC=petroleum oil with 17% emulsifier applied a 1 qt/A.

		-----Safflower-----				----Percent Control----				
Treatment	Rate	TW bu/Alb/bu	Yield lb/A	%sr	%ir	Grft	Wioa	Wimu	Ruth	Vogr
R-40244	0.125	41.9	740	0	0	0	0	73	14	13
R-40244	0.25	42.6	839	0	0	0	0	99	40	0
BAS-9052+OC	0.2+.5%V	38.7	1087	0	0	99	96	0	0	98
BAS-9052+OC	0.4+.5%V	37.3	746	0	0	99	99	0	0	98
Chlorsulfuron	0.167oz	41.3	824	0	5	14	0	100	0	0
Chlorsulfuron	0.25oz	40.0	395	0	16	38	0	100	0	0
Chlorsulfuron	0.50oz	40.3	711	5	8	69	0	100	18	0
Chlorsulfuron	0.75oz	41.3	907	9	9	86	0	100	54	0
BAS-9052+OC+R-40244	.2+.25	40.6	803	25	11	98	98	96	6	95
BAS-9052+OC+Chlorsulfuron	.2+.167oz	0.0	1333	3	5	98	98	100	96	97
BAS-9052+OC+Chlorsulfuron	.2+.25	41.6	1248	10	5	97	96	100	95	95
BAS-9052+OC+2,4-D B	.2+.5%V+.375	43.0	1069	3	9	98	95	96	51	91
2,4-D B	.375	41.4	654	0	11	0	0	94	13	0
2,4-D B	.5	42.0	665	0	9	0	0	93	66	0
Diclofop+R-9052	.75+.25	42.6	970	0	9	90	84	100	54	13
Chlorsulfuron+Surfactant	.25+.125%V	43.4	709	5	13	39	0	100	93	0
Chlorsulfuron+Surfactant	.5+.125%V	41.2	574	26	24	58	0	100	95	0
Control		44.0	577	0	0	0	0	0	0	0
Mean		39.1	825	5	7	55	37	80	39	33
High Mean		44.0	1333	26	24	99	99	100	96	98
Low Mean		0.0	395	0	0	0	0	0	0	0
Coeff of Variation			25	162	72	20	9	15	46	26
LSD (1 Percent)			394	14	10	21	7	23	33	16
LSD (5 Percent)			295	11	8	16	5	17	25	12
No. of Reps		1	4	4	4	4	4	4	4	4

Summary

R-40244 caused inportant safflower stand reduction and injury when applied with BAS-9052 with the oil additive, but did not reduce stand when applied with diclofop. Safflower seed yields were generally highest when both grass and broadleaf weed were controlled as with BAS-9052 in combination with chlorsulfuron or 2,4-D B. A surfactant added to the chlorsulfuron greatly enhanced Russian thistle control.

Weed control in lentils, Williston 1981. Preplant soil incorporated (PPI) herbicides were applied to a dry soil surface and incorporated twice with a Triple K on May 25 with 65F, 65% R.H., and a 7 mph southwest wind. 'Chilean' lentils were seeded 2 inches deep in rows spaced 12 inches apart and preemergence (PE) herbicides were applied on May 26 with 60F, 70% R.H., and a 5 mph west wind. Postemergence (P) treatments were applied to a medium density of 2 inch green foxtail, a low density of 3.5 leaf wild oats, a low density of 2 inch wild mustard, a medium density of 2 inch redroot pigweed, a high density of 2 inch Russian thistle and a low density of 2 inch common lambsquarters on June 2 with 66F, 65% RH, and a southwest wind at 3 mph. The experiment was a randomized complete block with 8 by 24 ft plots and was established on fallow fertilized with N at 45 lb/A. OC= petroleum oil with 17% emulsifier at 1 qt/A.

Treatment	Rate lb/A	-Lentils- %sr	%ir	---------Percent Control--------- Grft	Wioa	Wimu	Rrpw	Ruth	Colq
Trifluralin PPI	0.75	26	0	96	79	0	94	85	96
Pendimethalin PPI	1.0	28	0	97	84	10	95	31	93
R-40244+BAS-9052+OC PPI+P	.5+.2	0	0	99	97	67	78	23	93
R-40244+BAS-9052+OC PE+P	.5+.2	1	0	99	94	67	40	25	56
Pendimethalin PE	1.50	5	0	59	29	0	45	40	43
R-40244+BAS-9052+OC P	.25+.2	34	65	98	98	100	53	51	96
BAS-9052+OC P	.2	0	0	98	97	0	0	0	0
Control		0	0	0	0	0	0	0	0
Mean		12	8	81	72	30	50	32	60
High Mean		34	65	99	98	100	95	85	34
Low Mean		0	0	0	0	0	0	0	0
Coeff. of Variation		124	56	11	18	88	45	59	36
LSD (1 Percent)		29	9	18	26	65	45	38	43
LSD (5 Percent)		21	7	14	19	47	33	28	32
No. of reps		4	4	4	4	3	4	4	4

Summary

Trifluralin and pendimethalin preplant soil incorporated and R-40244 postemergence reduced lentil stands and R-40244 postemergence also caused injury to lentils. R-40244 and pendimethalin generally gave higher weed control when incorporated than when surface applied.

Weed control in buckwheat, Fargo 1982. Buckwheat was seeded at about 40 lb/A on May 26. The herbicides were applied to 2 to 8 inch buckwheat, 2 to 6 inch foxtail, and 3 to 5 leaf wild oats on June 23.

Treatment	Rate oz/A	-------Wheat------ %ir	%sr	--Percent Control-- Wioa	Yeft
Diclofop	12	0	0	62	67
Diclofop	24	0	0	80	88
BAS-9052+OC	4+.25G	0	0	88	83
BAS-9052+OC	8+.25G	0	0	97	100
Dalapon	12	0	0	15	23
Dalapon	24	0	0	17	88
Control		0	0	0	0
Mean		0	0	51	64
High mean		0	0	97	100
Low mean		0	0	0	0
Coeff. of variation		0	0	30	32
LSD(1 Percent)		0	0	38	51
LSD(5 Percent)		0	0	27	36
No. of reps		3	3	3	3

Summary

None of the herbicides caused any visable injury or stand reduction to the buckwheat. Bas-9052 at 4 or 8 oz/A with an oil additive at 0.25 gallons per acre and diclofop at 24 oz/A gave good control of both wild oats and yellow foxtail and dalapon at 24 oz/A gave good yellow foxtail control.

Postemergence grass and broadleaf herbicide combinations, Fargo NW22 1982. Evans soybeans, 894 sunflower, Bush Monofort sugarbeet, Era wheat, Mammoth oats, and Culbert flax were seeded in 6 foot strips for the solid seeded crops and 10 feet for the row crops across all plots, May 24.The area had a natural yellow foxtail infestation. Treatments were applied to 2 to 6 leaf sugarbeet, 5 inch flax, 4 to 5 leaf wheat, 5 leaf oats, first trifoliate soybean, 6 leaf sunflower, and 2 to 6 leaf yellow foxtail, June 25. Soil surface was dry, but surface moisture was adequate at treatment. Evaluations were July 21 and yellow foxtail control was also evaluated August 4.

Treatment	Rate lb/A	------Percent Control------ July						Aug	
		Sube	Flax	Wht	Oats	Sube	Sufl	Yeft	Yeft
BAS-9052	.1	0	4	14	15	9	7	85	68
BAS-9052	.2	0	0	34	27	6	6	93	94
BAS-9052+O	.1+.25G	2	0	50	44	0	5	96	99
BAS-9052+O	.2+.25G	0	0	98	89	2	3	97	99
BAS-9052+MCPA+O	.1+.25+.25G	89	0	44	35	40	98	95	91
BAS-9052+MCPA+O	.2+.25+.25G	87	1	97	88	45	97	95	98
BAS-9052+Bentazon+O	.1+.75+.25G	78	0	5	2	8	78	66	35
BAS-9052+Bentazon+O	.2+.75+.25G	91	0	24	18	6	85	70	88
BAS-9052+Acifluorfen+O	.1+.375+.25G	71	99	49	14	14	85	88	78
BAS-9052+Acifluorfen+O	.2+.375+.25G	69	97	79	66	12	69	91	95
BAS-9052+Bromoxynil+O	.1+.25+.25G	33	1	34	35	12	99	81	60
BAS-9052+Bromoxynil+O	.2+.25+.25G	45	2	90	64	20	99	94	96
BAS-9052+Desmedipham+O	.1+1+.25G	7	13	63	39	12	50	91	92
BAS-9052+Desmedipham+O	.2+1+.25G	9	22	84	53	19	37	91	95
Control - BAS-9052		0	0	1	2	0	0	5	0
PP-009	.125	2	3	90	71	6	12	23	35
PP-009	.25	8	0	100	93	8	12	61	62
PP-009+O	.125+.25G	5	0	100	91	5	10	76	78
PP-009+O	.25+.25G	0	0	100	98	3	8	97	92
PP-009+MCPA+O	.125+.25+.25G	90	1	98	55	31	100	21	20
PP-009+MCPA+O	.25+.25+.25G	88	3	100	99	43	97	92	90
PP-009+Bentazon+O	.125+.75+.25G	96	0	98	93	7	92	36	35
PP-009+Bentazon+O	.25+.75+.25G	97	0	100	99	4	69	91	89
PP-009+Acifluorfen+O	.125+.375+.25G	59	100	94	91	13	78	41	50
PP-009+Acifluorfen+O	.25+.375+.25G	58	100	100	100	12	81	69	73
PP-009+Bromoxynil+O	.125+.25+.25G	49	10	99	89	19	99	37	35
PP-009+Bromoxynil+O	.25+.25+.25G	37	0	100	99	11	99	66	48
PP-009+Desmedipham+O	.125+1+.25G	6	13	89	49	9	46	43	40
PP-009+Desmedipham+O	.25+1+.25G	6	10	96	71	12	40	45	43
Control - PP-009		0	0	0	0	3	2	0	0
Dowco-453	.075	0	0	85	88	1	5	47	40
Dowco-453	0.15	0	0	100	100	7	6	73	73
Dowco-453+O	.075+.25G	2	0	100	100	5	4	88	73
Dowco-453+O	.15+.25G	0	0	100	100	3	7	99	100
Dowco-453+MCPA+O	.075+.25+.25G	89	0	100	100	35	99	65	60
Dowco-453+MCPA+O	.15+.25+.25G	89	0	100	100	36	97	91	79
Dowco-453+Bentazon+O	.075+.75+.25G	96	0	100	100	7	91	69	30
Dowco-453+Bentazon+O	.15+.75+.25G	95	0	100	100	4	87	86	75
Dowco-453+Acif+O	.075+.375+.25G	67	98	100	100	9	75	63	38
Dowco-453+Acif+O	.15+.375+.25G	84	99	100	100	15	84	94	70
Dowco-453+Bromoxynil+O	.075+.25+.25G	62	8	100	100	13	44	67	50
Dowco-453+Bromoxynil+O	.15+.25+.25G	29	2	100	100	19	95	86	78
Dowco-453+Desmedipham+O	.075+1+.25G	3	16	83	82	10	49	62	50
Dowco-453+Desmedipham+O	.15+1+.25G	25	10	99	98	6	52	75	50
Control - Dowco-453		0	0	0	0	0	2	2	0

Table . Continued

Treatment	Rate lb/A	Percent Control Sube	Flax	Wht	Oats	July Sube	Sufl	Aug Yeft	Yeft
CGA-82725	.125	0	0	2	4	4	3	23	15
CGA-82725	.25	0	0	4	7	2	3	21	25
CGA-82725+0	.125+.25G	0	0	6	99	3	4	93	80
CGA-82725+0	.25+.25G	3	0	12	100	2	10	92	98
CGA-82725+MCPA+0	.125+.25+.25G	89	0	4	82	31	99	54	40
CGA-82725+MCPA+0	.25+.25+.25G	87	2	7	100	38	98	89	85
CGA-82725+Bentazon+0	.125+.75+.25G	97	7	4	100	6	92	89	80
CGA-82725+Bentazon+0	.25+.75+.25G	95	7	13	100	3	67	94	80
CGA-82725+Acif+0	.125+.375+.25G	59	98	18	96	10	82	86	55
CGA-82725+Acif+0	.25+.375+.25G	39	91	24	99	10	59	88	90
CGA-82725+Bromoxynil+0	.125+.25+.25G	82	12	5	100	17	94	75	91
CGA-82725+Bromoxynil+0	.25+.25+.25G	55	5	12	100	16	95	88	94
CGA-82725+Desmedipham+0	.125+1+.25G	8	7	9	49	3	39	59	30
CGA-82725+Desmedipham+0	.25+1+.25G	11	28	8	72	3	28	72	84
Control - CGA-82725		0	0	3	1	0	0	3	0
SC-1058	0.1	0	0	1	1	0	3	11	20
SC-1058	0.2	0	0	26	8	3	3	29	65
SC-1058+0	.1+.25G	0	0	25	9	3	6	20	48
SC-1058+0	.2+.25G	0	0	87	51	3	5	57	65
SC-1058+MCPA+0	.1+.25+.25G	90	0	7	2	29	99	30	0
SC-1058+MCPA+0	.2+.25+.25G	88	0	53	29	32	99	11	15
SC-1058+Bentazon+0	.1+.75+.25G	92	1	21	7	8	89	30	23
SC-1058+Bentazon+0	.2+.75+.25G	84	0	63	26	3	69	31	35
SC-1058+Acifluorfen+0	.1+.375+.25G	77	99	18	3	8	62	26	5
SC-1058+Acifluorfen+0	.2+.375+.25G	69	100	15	10	9	83	34	25
SC-1058+Bromoxynil+0	.1+.25+.25G	56	18	39	21	3	88	23	28
SC-1058+Bromoxynil+0	.2+.25+.25G	59	1	89	46	18	99	39	25
SC-1058+Desmedipham+0	.1+1+.25G	2	8	12	4	3	39	11	15
SC-1058+Desmedipham+0	.2+1+.25G	3	22	11	6	8	25	19	10
Control - SC-1058		0	0	6	1	0	4	0	0
HOE-00581	0.1	0	0	11	78	4	3	91	90
HOE-00581	0.2	2	0	16	90	10	4	89	95
HOE-00581+0	.1+.25G	3	0	23	85	0	5	91	99
HOE-00581+0	.2+.25G	2	0	30	96	10	6	92	95
HOE-00581+MCPA+0	.1+.25+.25G	92	7	10	68	58	98	86	65
HOE-00581+MCPA+0	.2+.25+.25G	89	0	8	93	42	100	93	87
HOE-00581+Bentazon+0	.1+.75+.25G	80	0	11	75	5	69	53	30
HOE-00581+Bentazon+0	.2+.75+.25G	90	0	21	94	4	44	83	70
HOE-00581+Acifluorfen+0	.1+.375+.25G	79	100	18	66	18	77	56	13
HOE-00581+Acifluorfen+0	.2+.375+.25G	78	99	21	86	19	85	74	40
HOE-00581+Bromoxynil+0	.1+.25+.25G	48	6	16	68	19	92	16	0
HOE-00581+Bromoxynil+0	.2+.25+.25G	38	4	27	86	24	97	59	30
HOE-00581+Desmedipham+0	.1+1+.25G	8	11	11	33	13	42	39	28
HOE-00581+Desmedipham+0	.2+1+.25G	3	20	14	51	11	44	43	33
Control - HOE-00581		0	0	4	1	1	2	1	0
Mean		41	16	48	62	12	53	61	55
High mean		97	100	100	100	58	100	99	100
Low mean		0	0	0	0	0	0	0	0
Coeff. of variation		28	50	17	14	62	20	26	34
LSD(1 Percent)		24	17	17	18	16	22	33	49
LSD(5 Percent)		19	13	13	14	12	17	25	37
No. of reps		3	3	3	3	3	3	3	2

Summary

Grass control herbicides were enhanced by the oil addition, except for HOE-00581. Desmedipham in mixture with the grass control herbicides was the most antagonistic to grass species control, except bentozen was most antagonistic with BAS-9052. MCPA was not antagonistic to BAS-9052, but generally antogonistic to control of one or more grass species with the other grass control herbicides. Comparing these results with those of the experiment with oil additions with broadleaf control herbicides indicated that generally grass control herbicides did not influence control of broadleaf species.

Postemergence broadleaf herbicides with oils, Fargo NW22 1982. Evans soybeans, 894 sunflower, Bush Monofort sugarbeet, Era wheat, Mammoth oats, and Culbert flax were seeded in 6 foot strips for the solid seeded crops and 10 feet for the row crops across all plots, May 24. The area had a natural yellow foxtail infestation. Treatments were applied to 2 to 6 leaf sugarbeet, 5 inch flax, 4 to 5 leaf wheat, 5 leaf oats, 1 inch trifoliate soybean, 6 leaf sunflower, and 2 to 6 leaf yellow foxtail, June 25. Soil surface was dry, but surface moisture was adequate at treatment. Evaluations were on July 21.

Treatment	Rate lb/A	Percent Control						
		Sube	Flax	Wht	Oats	Soys	Sufl	Yeft
MCPA+O	.25+.25G	91	0	0	2	40	100	12
Bentazon+O	.75+.25G	97	0	5	3	3	88	12
Acifluorfen+O	.375+.25G	67	96	20	12	5	75	6
Bromoxynil+O	.25+.25G	50	0	7	2	7	100	7
Desmedipham+O	1+.25G	3	37	8	13	8	52	15
MCPA	.25	93	0	0	2	8	97	3
Bentazon	.75	75	0	10	8	7	63	4
Acifluorfen	.375	8	77	15	10	3	17	11
Bromoxynil	.25	58	0	7	7	7	81	15
Desmedipham	1.0	0	40	17	13	3	25	16
Control		0	0	8	8	0	3	0
Mean		49	23	9	7	8	64	9
High mean		97	96	20	13	40	100	16
Low mean		0	0	0	2	0	3	0
Coeff. of variation		29	67	72	95	122	29	98
LSD(1 Percent)		33	35	15	16	24	43	21
LSD(5 Percent)		24	26	11	12	17	32	15
No. of reps		3	3	3	3	3	3	3

Summary

Oil additions to broadleaf control herbicide spray mixture generally increased phytotoxicity to the broadleaf species with marginal tolerance.

Roller and wick application of picloram for leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. Experiments were conducted to determine the effectiveness of roller and wick application of picloram as an economical alternative for leafy spurge control in pastureland. Leafy spurge control was compared for conventional broadcast, roller and wick application. Also, variable picloram concentrations, wick designs, height of applicator during treatment and time of treatment were evaluated. The wick applicator is similar to the rope-wick applicator but uses a poly-foam backed canvas instead of the rope and delivers more volume of solution per acre for improved coverage in dense leafy spurge stands. (Wick design described in 1981 NCWCC Research Report 38:36-37).

All experiments were a randomized complete block design with four replications, except the first experiment had five replications. The broadcast treatments were applied at 35 psi, and at 8.5 gpa for the first experiment and 8 gpa for the last three experiments. The picloram concentrations with the roller and wick applications varied from 1:1 to 1:15 picloram (Tordon 22K):water (v:v). The 1:7 concentration was comparable to picloram at 2 lb/A broadcast at 8 gpa (1 gal Tordon 22K:7 gal water). The roller and wick applicators were adjusted to treat the top half of the tallest leafy spurge. Evaluations were based on reduction of plant density as compared to the control.

The first experiment was established on 3 October 1979 near Walcott, ND with broadcast treatments of picloram compared to roller applications at 1 or 3 mph. The leafy spurge was 20 to 25 inches tall with senescent lower leaves but with new fall growth on the stem tip. The temperature was in the low 40's F and a killing frost occurred within 6 days of treatment.

Picloram broadcast at 2 lb/A provided 100% control in the year following treatment, and control had decreased steadily to 85% by the end of the third year (Table 1). The roller applied treatments and picloram at 1 lb/A broadcast provided similar leafy spurge control for one year, but the roller applied treatments were better 2 and 3 years after application.

Table 1. Leafy spurge control with picloram using the roller applicator near Walcott, ND for treatments applied 3 October 1979. (Lym and Messersmith).

Type of application	Rate [a]	Control				
		May 1980	June 1980	May 1981	Aug. 1981	June 1982
	(lb/A)	(%)				
Broadcast	1	99	79	59	19	6
Broadcast	2	100	100	98	96	85
Roller - 1 mph	2	99	80	61	43	34
Roller - 2 mph	2	94	77	70	53	24
LSD(0.05)		6	13	19	32	28

[a] Solution concentration on the roller was the same as 2 lb/A at 8.5 gpa broadcast (picloram (Tordon 22K):water=1:7.5 v:v).

The second experiment evaluated the most efficient picloram concentration for use with the roller and wick applicators. Solution concentrations ranged from 1:1 to 1:15 picloram (Tordon 22K):water (v:v). An experiment was established in the spring on 16 June 1980 near Sheldon, ND and in the fall near Valley City, ND on 2 September 1980. The lowest solution concentration that gave adequate leafy spurge control was considered the most efficient because it used less picloram per acre than a more concentrated solution. The 1:1 solution concentration provided the highest leafy spurge control after two years (Table 2). However, the 1:3 solution concentration may be the most efficient mixture, because both 1:1 and 1:3 solution concentrations provided similar control with both applicators through 1981 and retreatment would have been recommended for all treatments in June 1982. Control was similar between spring and fall treatments when compared one year after application.

Table 2. Leafy spurge control with variable picloram concentrations using the roller and wick applicators with treatments applied on 16 June 1980 at Sheldon and 2 September 1980 at Valley City. (Lym and Messersmith).

		Location/Evaluation date					
		Sheldon			Valley City		
Applicator	Picloram [a] concentration	May 1981	Aug. 1981	June 1982	June 1981	Sept. 1981	June 1982
		% control					
Roller	1:1	90	58	59	96	93	65
Roller	1:3	93	48	40	97	81	34
Roller	1:7	75	15	17	91	50	15
Roller	1:11	70	9	4	67	15	6
Roller	1:15	69	12	6	35	3	2
Wick	1:1	88	38	43	96	92	40
Wick	1:3	80	18	8	93	78	16
Wick	1:7	41	2	0	79	28	3
Wick	1:11	49	8	3	68	5	0
Wick	1:15	62	5	0	15	0	0
LSD(0.05)		14	21	30	17	22	32

[a] Picloram (Tordon 22K):water (v:v).

The third experiment evaluated picloram application to leafy spurge at three solution concentrations, two roller application heights and two dates of application. The roller height was adjusted to treat the top half of most leafy spurge plants (high) or as near to the soil surface as the terrain would permit (low). The picloram solution concentrations were 1:3, 1:5 and 1:7 (v:v) and were applied on 8 July 1981 (summer) or 1 September 1981 (fall). Fall treatments resulted in the best leafy spurge control across all solution concentrations especially when applied at the low height (Table 3). Among the fall treatments picloram at 1:7 (v:v) applied at the low height provided the best leafy spurge control at 56%.

Table 3. Leafy spurge control with variable picloram concentrations using the roller applicator at two heights applied on 8 July and 1 September 1981. (Lym and Messersmith).

Time of application	Picloram [a] concentration	Roller height					
		June 1982			August 1982		
		Low	High	Mean	Low	High	Mean
		% control					
Summer	1:3	38	5	22	5	3	4
	1:5	14	6	10	9	2	6
	1:7	11	6	9	12	0	6
Mean		21	6	14	9	2	6
Fall	1:3	60	13	37	37	5	21
	1:5	88	8	48	34	2	18
	1:7	64	18	41	56	1	29
Mean		71	13	42	42	3	23

June LSD(0.05) = Conc=25; Height=20; Height x Conc=32; Time x Height x Conc=14

Aug. LSD(0.05) = Conc=11; Height=9; Height x Conc=22; Time x Height x Conc=6

[a] Picloram (Tordon 22K):water (v:v).

The fourth experiment evaluated three designs of a pipe-wick applicator. The pipe-wick consisted of 0.75 inch PVC pipe with 0.12 inch drilled every two inches and covered by 0.5 inch poly-foam overlayed with canvas. The wicking material was wrapped around about 75% of the pipe circumference and attached to the PVC pipe with contact cement. Liquid in the storage tank flowed into the wick with flow rate dependent on weed density. The design consisted of 1) two 6-foot bars, one foot apart rectangular shaped (2-bar applicator); 2) three 6-foot bars one foot apart rectangular shaped (3-bar applicator); and 3) two 6-foot bars one foot apart with three interconnecting diagonal bars so each leafy spurge stem was treated by the front, diagonal and rear bar (diagonal applicator). Picloram at 1:3 (v:v) was applied using the wicks either with one pass or two passes; the second pass was in the opposite direction to the first pass. Picloram applied using two passes resulted in better leafy spurge control than a single pass regardless of applicator type (Table 4). Picloram application with the diagonal wick resulted in better leafy spurge control than with either 2-bar or 3-bar rectangular design, while the 2- and 3-bar designs provided similar leafy spurge control.

Table 4. Leafy spurge control with picloram using several wick applicators with treatments applied on 10 August 1981. (Lym and Messersmith).

Applicator	No. passes	Picloram[a] concentration	Control June 1982	Control August 1982
			(%)	
2-Bar	1	1:3	77	36
2-Bar	2	1:3	88	77
3-Bar	1	1:3	75	15
3-Bar	2	1:3	92	80
Diagonal	1	1:3	71	56
Diagonal	2	1:3	100	99
LSD(0.05)			21	25

[a] Picloram (Tordon 22K):water (v:v).

In general, picloram applied using the roller applicator provided similar control to picloram at 1 lb/A broadcast, but retreatment during the second growing season after the initial treatment would be recommended following both treatments. Fall applications of picloram have been more effective then spring applications when using the roller applicator. The wick may be the most practical applicator because it is comparatively easy and inexpensive to build and operate. (Cooperative investigation Dep. of Agron. and ARS, U.S. Dep. of Agric. Published with the approval of the Agric. Exp. Stn., North Dakota State Univ., Fargo.)

Picloram and 2,4-D combination treatments for leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. Picloram is an effective herbicide for leafy spurge control especially when applied at rates from 1 to 2 lb/A. However, the high cost of the 2 lb/A treatment makes it uneconomical to treat large acreages in pasture and rangeland weed control programs. Research at NDSU has suggested that picloram at 0.25 to 0.5 lb/A applied annually will give satisfactory leafy spurge control after 3 to 5 years. The purpose of this experiment is to establish the number of annual applications of picloram needed to provide 90 to 100% control of leafy spurge at various locations in the state and to investigate possible synergism between picloram and 2,4-D.

The experiment was established on 25 August 1981 at Dickinson, 1 September 1981 at Sheldon and on 11 June 1982 at Valley City. All treatments were applied annually except 2,4-D alone which was applied biannually (both spring and fall). Thus the Dickinson and Sheldon sites have received two picloram and picloram plus 2,4-D treatments and three 2,4-D treatments, while the Valley City site has received one and two treatments, respectively. The plots are 10 by 30 ft and each treatment is replicated four times in a randomized complete block at all sites. Evaluations were based on percent stand reduction as compared to the control and are shown in the table.

Picloram at 0.25, 0.375 and 0.5 lb/A provided 49, 66 and 74% control, respectively, after two treatments at Dickinson and Sheldon. These observations represent an increase of 21, 24, and 23% control, respectively, compared to the June evaluation after one treatment. 2,4-D did not give satisfactory control of leafy spurge.

		Control 1982						
		Sheldon		Dickinson		Average[a]		Valley City
Herbicide	Rate	June	Aug.	June	Sept.	June	Fall	Aug.
	(lb/A)	(%)						
Picloram	0.25	33	49	24	48	28	49	68
Picloram	0.375	46	79	37	56	42	66	78
Picloram	0.5	72	75	30	74	51	74	81
2,4-D biannually	1.0	23	22	11	30	17	27	5
2,4-D biannually	1.5	9	15	10	20	9	18	14
2,4-D biannually	2.0	14	20	8	9	11	14	37
Picloram+2,4-D	0.25+1.0	26	54	53	69	39	63	41
Picloram+2,4-D	0.25+1.5	35	58	46	61	41	60	50
Picloram+2,4-D	0.25+2.0	52	78	53	49	52	61	49
Picloram+2,4-D	0.375+1.0	70	78	49	64	59	70	67
Picloram+2,4-D	0.375+1.5	68	74	63	67	66	70	61
Picloram+2,4-D	0.375+2.0	43	81	65	69	54	74	64
Picloram+2,4-D	0.5+1.0	76	77	66	79	71	78	61
Picloram+2,4-D	0.5+1.5	79	58	66	65	73	62	82
Picloram+2,4-D	0.5+2.0	66	75	66	80	66	78	87
LSD(0.05)		27	26	23	19	24	18	30

[a] Experiment at Valley City began in June 1981 and is not included in average.

Spring evaluations revealed a trend towards increased leafy spurge control when 2,4-D at 1.0 to 2.0 lb/A was applied with picloram at 0.25 to 0.5 lb/A compared to the respective picloram treatments applied alone. The additive response was seen following spring retreatments for picloram at 0.25 plus 2,4-D at 1.0, 1.5 and 2.0 lb/A, but not for the higher rates of picloram. At Valley City, the addition of 2,4-D to picloram tended to decrease leafy spurge control when evaluated less than 3 months after application; perhaps the 2,4-D caused rapid control of leafy spurge before picloram translocation was complete since growing conditions were ideal during the spring of 1982. Annual applications of picloram have shown an increase in leafy spurge control over time while biannual treatments of 2,4-D have not. Tank mixtures of 2,4-D with picloram have given varying results. (Cooperative investigation Dep. of Agron. and ARS, U.S. Dep. of Agric. Published with the approval of the Agric. Exp. Stn., North Dakota State Univ., Fargo.)

Leafy spurge control under trees with various herbicides. Lym, Rodney G. and Calvin G. Messersmith. Leafy spurge is a major problem in wooded areas, shelterbelts, and around homes. Glyphosate can be safely used under and near trees with leafy spurge control generally ranging from 80 to 90% when the herbicide is fall applied. Two disadvantages of glyphosate are its non-selectivity resulting in mostly bare ground and a retreatment with 2,4-D is required the following year to control seedlings. Picloram controls leafy spurge, but it is toxic to trees, especially shallow rooted species which are likely to absorb injurious amounts of picloram. The controlled droplet applicator (CDA) is designed to deliver herbicides in precisely measured droplets, and generally delivers less herbicide per acre than conventional sprayers. The CDA is lightweight and easier to operate compared to a conventional hand-held sprayer. The purpose of these experiments was to evaluate the CDA and compressed air (Hudson single nozzle hand pumped model) sprayers for application of picloram, dicamba and glyphosate to leafy spurge growing under trees. Also dichlobenil 10G was applied at one site as a preemergence treatment for leafy spurge control.

The experiments were established at Mandan, ND in a tree grove and at Walcott, ND in a wind break. The trees were Populus spp. (cotton wood and aspen) and ranged from 6 to 12 inches in diameter with some saplings intermixed. The experiment at Mandan was established on 26 August 1981 under a partly cloudy sky, 70 F and 96% humidity. The plot size was 25 by 50 ft. The experiment at Walcott was established on 17 September 1981 under a partly cloudy sky, 70 F and 35% humidity, except the dichlobenil treatments were applied on 24 November 1981 under a cloudy sky, 32 F and 87% humidity. The plots were 50 by 20 ft. All glyphosate treated plots received two 2,4-D amine retreatments in the summer of 1982 using the CDA with a solution concentration of 1:4 (2,4-D:water v:v). The treatments using the CDA and compressed air sprayers were applied with single coverage at walking speed, except some overlap occurred as the applicator tried to prevent skipped areas while walking around trees. The data are reported in the Table.

Leafy spurge control in June 1982 with glyphosate ranged from 95 to 100% using either applicator which is similar to control normally obtained with glyphosate at 1 lb/A broadcast. Leafy spurge control remained satisfactory in September 1982, with glyphosate applied at 1:1, 1:3 (v:v) by CDA and 1:7 (v:v) by compressed air sprayer.

Picloram at 1:3 and 1:7 (v:v) applied with the CDA gave good leafy spurge control in the spring. Leafy spurge control with picloram at 1:3 (v:v) remained at 85% control at Mandan in the fall, but some saplings showed herbicide injury. The best treatment at Walcott in the fall was picloram at 1:7 (v:v) with 90% control. Picloram at 1:33 (v:v) applied with the compressed air sprayer resulted in 100% control one year after treatment, but at 1:67 (v:v) control ranged from 0 to 40%.

The treatments of picloram plus 2,4-D at 1:1:10 (v:v:v) applied with the CDA or 1:2:65 (v:v:v) applied with the compressed air sprayer resulted in 100 and 90% control, respectively after one year. The dicamba treatments provided satisfactory control only when applied using the compressed air sprayer. Dichlobenil did not provide satisfactory leafy spurge control.

Table. Leafy spurge control by various herbicides applied with the controlled droplet and compressed air applicators under trees - Walcott and Mandan, ND. (Lym and Messersmith).

Application	Herbicide	Herbicide concentration (Herbicide:water)	Control			
			Mandan		Walcott	
			June 82	Sept. 82	June 82	Sept. 82
			(%)			
CDA	Glyphosate	1:1	100	90	95	78
	Glyphosate	1:3/1:2	95	100	85	50
	Picloram	1:3	100	85[a]	98	65
	Picloram	1:7	90	70	92	90
	Dicamba	1:3	---	---	98	0
	Picloram+2,4-D	1:1:10	---	---	99	100
Compressed air	Glyphosate	1:7	100	100	92	95
	Glyphosate	1:14	99	90	85	60
	Picloram	1:67	70	40	75	0
	Picloram	1:33	98	100	100	100
	Dicamba	1:33	---	---	97	95
	Picloram+2,4-D	1:2:65	80	40	90	90
	Picloram+2,4-D	1:4:63	80	20	---	---
Granular	Dichlobenil	4 lb/A	---	---	20	0
	Dichlobenil	8 lb/A	---	---	60	30

[a] Damage to saplings.

Glyphosate provided good leafy spurge control when applied using the CDA or compressed air sprayer. Leafy spurge control was good when picloram was applied using the CDA at 1:3 (v:v) or the compressed air sprayer at 1:33 (v:v). The combination treatments of 2,4-D plus picloram did show some synergism in leafy spurge control. Further research is needed with both applicators to determine the risk of damage to trees at various rates and under different environmental conditions. (Cooperative investigation Dep. of Agron. and ARS, U.S. Dep. of Agric. Published with the approval of the Agric. Exp. Stn., North Dakota State Univ., Fargo.)

Granular picloram and dicamba for leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. Granular and liquid formulations of picloram and dicamba were compared for leafy spurge control in six experiments established in 1980 on 25 June and 3 September near Valley City, 2 July near Tolna, 10 July near Minot, 15 July near Dickinson and on 25 August 1981 near Dickinson. An experiment to compare liquid and granular picloram in a sandy soil was established on 11 June 1980 in the Sheyenne National Grasslands near McLeod, ND. All experiments were in a randomized complete block design with four replications and 10 by 30 ft plots. The granules were applied uniformly by hand, while the liquid formulations were applied with a tractor mounted sprayer at 8.5 gpa. Evaluations were based on percent stand reduction compared to the control. The ANOVA test revealed that there was a significant interaction between site and treatments. Therefore, experimental sites will be discussed individually.

Leafy spurge control with picloram and dicamba at Valley City generally was higher from fall than spring applied treatments, especially when evaluated 24 months after treatment (Table 1). Picloram 2%G at 1.5 and 2.0 lb/A fall applied provided 96 and 100% leafy spurge control after two years compared to 87 and 90%, respectively, when spring applied. The spring applied treatments dropped in control dramatically to 22 and 53% respectively after 27 months. Picloram 2S at 2.0 lb/A provided 98 and 100% leafy spurge control after two seasons when spring and fall applied, respectively. Dicamba 4S and 5%G at 8.0 lb/A provided 28 and 45% control when spring applied and 97 and 83% control when fall applied, respectively. Fall applied dicamba 4S and 5%G at 8 lb/A and picloram at 2 lb/A provided similar control after one year but the control with granular dicamba dropped to 83% by the second year. The spring 1980 applied dicamba did not give satisfactory leafy spurge control in 1982.

Leafy spurge control at Valley City generally was better than at other sites. At Tolna, picloram 2S at 2 lb/A and 2%G at 1.5 and 2.0 lb/A provided 93, 83 and 90% leafy spurge control, respectively, when evaluated 25 months after treatment (Table 1). Dicamba 4S and 5%G at 8 lb/A provided 61 and 66% leafy spurge control, respectively, after 25 months. At Minot, no treatment provided satisfactory leafy spurge control after two years with picloram 2S at 2 lb/A providing the best control at 53%. At Dickinson in the 1980 experiment only picloram 2S at 2 lb/A provided satisfactory control at 90%, but the same treatment applied in 1981 had 30% control after only one year which is much lower than normally occurs. Picloram 2%G at 2 lb/A applied in 1980 and 1981 provided 74 and 91% control after one year, respectively. Dicamba did not give satisfactory control at one year in either experiment.

Picloram 2S and 2%G at equal rates provided similar leafy spurge control over a 26 month period when evaluated on the sandy soil of the Sheyenne National Grasslands (Table 2). Picloram 2S and 2%G provided 88 and 89% control in August 1982 respectively, but the other treatments did not maintain satisfactory control.

Granular and liquid formulations of dicamba or picloram generally provided similar leafy spurge control at comparable rates. Picloram at 2 lb/A was the only treatment that consistently provided long term control. In general leafy spurge control decreased more rapidly in the drier areas of western North Dakota than at the eastern sites. Once leafy spurge control decreased to 70 to 80%, control declined rapidly thereafter at all sites. (Cooperative investigation Dep. of Agron. and ARS, U.S. Dep. of Agric. Published with the approval of the Agric. Exp. Stn., North Dakota State Univ., Fargo.)

Table 1. Granular picloram and dicamba for leafy spurge control at various locations in North Dakota. (Lym and Messersmith).

Herbicide	Rate	Location/evaluation date: Valley City, Spring treatment 6-81	9-81	6-82	9-82	Valley City, Fall treatment 6-81	9-81	6-82	9-82	Tolna 6-81	9-81	7-82	Minot 6-81	9-81	6-82	Dickinson[a] 1980 8-81	9-82	1981 6-82	9-82
	(lb/A)	(% control)																	
Picloram 2%G	1.0	97	80	53	25	95	86	84	55	79	60	66	72	28	13	56	31	76	25
Picloram 2%G	1.5	98	89	87	22	99	100	100	96	88	98	83	85	30	15	74	65	95	45
Picloram 2%G	2.0	99	98	90	53	100	100	99	100	98	100	90	96	81	40	74	73	97	91
Dicamba 5%G	4.0	74	55	9	3	94	74	43	31	31	5	17	19	0	0	4	3	58	20
Dicamba 5%G	6.0	82	54	25	3	96	99	89	58	44	10	37	56	20	5	30	10	66	30
Dicamba 5%G	8.0	91	75	45	19	99	100	98	83	70	57	43	66	27	13	39	20	94	51
Picloram 2S	2.0	100	99	98	90	100	100	100	100	100	95	93	98	85	53	91	90	95	30
Dicamba 4S	8.0	94	74	28	12	99	99	100	97	88	89	70	61	5	4	42	25	84	19
LSD(0.05)		9	14	21	17	3	10	22	29	18	15	40	20	30	15	26	19	21	22

[a] Two separate experiments begun at Dickinson in August of 1980 and 1981 respectively.

Table 2. Leafy spurge control using picloram liquid and granules in a sandy soil in the Sheyenne National Grasslands. (Lym and Messersmith).

Herbicide formulation	Rate	Control: May 1981	August 1981	June 1981	August 1982
	(lb/A)	(%)			
Picloram 2S	0.5	73	13	3	1
Picloram 2S	1.0	98	73	24	25
Picloram 2S	2.0	100	99	94	88
Picloram 2%G	0.5	53	5	0	0
Picloram 2%G	1.0	97	72	23	14
Picloram 2%G	2.0	100	98	90	89
LSD(0.05)	---	25	12	14	12

Plant growth regulators and herbicides for leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. Four experiments were established near Sheldon, ND to evaluate two Plant Growth Regulators (PGR's) as a pretreatment to herbicides for leafy spurge control. The PGR's were mefluidide and a cytokinin hormone concentrate (Cytex™ by Atlantic and Pacific Research, N. Palm Beach, FL). The PGR's were applied three days prior to the herbicide application. The herbicides were applied at less than normal use rates to observe any increase in leafy spurge control resulting from a PGR pretreatment. Two experiments were established for each PGR, the first on 17 July and the second on 1 September 1981. The plots were 10 by 30 ft, and treatments were replicated four times in a randomized complete block design. The treatments were applied in 8.5 gpa at 35 psi. Evaluations were based on percent stand reduction as compared to the control on 3 June and 13 August 1982.

Treatment	Rate (lb/A)	Control Summer 1981[a] June	Summer 1981[a] Aug.	Fall 1981[b] June	Fall 1981[b] Aug.
			(%)		
Mefluidide pretreatment					
Acifluorfen	1.0	2	0	20	17
2,4-D	1.0	7	3	15	5
Dicamba	1.0	7	1	14	2
Picloram	0.375	23	6	22	5
Acifluorfen+mefluidide	1.0+0.25	0	0	2	0
2,4-D+mefluidide	1.0+0.25	6	1	4	2
Dicamba+mefluidide	1.0+0.25	7	1	12	6
Picloram+mefluidide	0.375+0.25	13	8	23	2
Mefluidide	0.25	0	0	5	2
LSD(0.05)		4	5	20	16
			(%)		
Cytokinin pretreatment					
Acifluorfen	1.0	2	0	0	0
2,4-D	1.0	4	0	2	0
Dicamba	1.0	5	3	9	0
Picloram	0.375	25	8	66	4
Acifluorfen+cytokinin	1.0+0.25	2	0	2	0
2,4-D+cytokinin	1.0+0.05	3	0	0	0
Dicamba+cytokinin	1.0+0.25	9	6	5	0
Picloram+cytokinin	0.375+0.25	61	9	42	6
Cytokinin	0.25	0	0	5	2
LSD(0.05)		4	5	11	6

[a] PGR's applied 17 July 1981 and herbicide 20 July 1981.

[b] PGR's applied 1 September 1982 and herbicide 4 September 1981.

Herbicide application caused the most rapid top growth control in plants receiving a cytokinin pretreatment. The rapid top growth control was not observed in plants receiving a mefluidide pretreatment. Pretreatment with either PGR did not result in increased leafy spurge control in 1982 compared to herbicides used alone (Table). (Cooperative investigation Dep. of Agron. and ARS, U.S. Dep. of Agric. Published with the approval of the Agric. Exp. Stn., North Dakota State Univ., Fargo.)

2,4-D dimethylamine SULV for leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. Two experiments were establised to compare 2,4-D dimethylamine SULV (Thompson-Hayward Co., Kansas City, KS) with 2,4-D amine, 2,4-D ester, dicamba and picloram for leafy spurge control. The first experiment was established near Sheldon, ND on 17 July 1981 when the leafy spurge was 16 to 36 inches tall and most seed had reached maturity. The weather was 84 F, 53% relative humidity, and the soil was dry and 88 F at one inch. The second experiment was established on 11 September 1981 when the leafy spurge was 30 to 40 inches tall and had 2 to 3 inches of new fall growth. The soil was dry and 68 F at one inch. The temperature was 70 F, 56% relative humidity, and the sky was clear. Herbicides were applied broadcast with a tractor mounted sprayer using 8.5 gpa and 35 psi. Ethylene glycol, an additive in the formulation of 2,4-D dimethylamine SULV, was added to 2,4-D amine, 2,4-D ester, dicamba and picloram treatments at 5% (v:v) in the first experiment. The plots were 10 by 30 ft in a randomized complete block design for both experiments. Evaluations were based on percent stand reduction as compared to the control.

Herbicide	Rate	Control	
		June 1982	Aug. 1982
Experiment 1 (treated 17 July 1981)	(lb/A)	---------(%)--------	
2,4-D dimethylamine SULV	1.0	10	3
2,4-D amine (alkanolamine salt)	1.0	8	6
Dicamba	1.0	7	0
Picloram	0.375	13	5
2,4-D amine+ethylene glycol	1.0+5%	7	0
Dicamba+ethylene glycol	1.0+5%	11	0
Picloram+ethylene glycol	1.0+5%	9	11
LSD(0.05)		7	6
Experiment 2 (treated 11 Sept. 1981)		---------(%)--------	
2,4-D dimethylamine SULV	2.0	8	2
2,4-D dimethylamine SULV	3.0	6	1
2,4-D dimethylamine SULV	4.0	19	2
2,4-D amine (alkanolamine salt)	4.0	22	8
2,4-D ester (propylene glycol butyl ether)	4.0	13	1
Picloram	1.0	98	52
Picloram	2.0	100	92
LSD(0.05)		12	14

The addition of ethylene glycol to the herbicides did not change the leafy spurge control compared to herbicides used alone. The leafy spurge control was similar for all herbicides at the rates tested in the first experiment. In the second experiment, leafy spurge control was similar between 2,4-D dimethylamine SULV, 2,4-D amine and 2,4-D ester when applied at 4.0 lb/A. Picloram at 1.0 and 2.0 lb/A provided 52 and 92% leafy spurge control, respectively, compared to 1 to 8% control for the 2,4-D formulations after one year. The 2,4-D dimethylamine SULV formulation provided similar leafy spurge control to 2,4-D amine and ester formulations. The addition of ethylene glycol did not improve leafy spurge control by any of the herbicides tested. (Cooperative investigation of Agron. and ARS, U.S. Dep. of Agric. Published with the approval of the Agric. Exp. Stn., North Dakota State Univ., Fargo.)

Long term management of leafy spurge in pasture and rangeland - year two. Messersmith, Calvin G. and Rodney G. Lym. Seven experiments were established around North Dakota in 1980 to evaluate long term leafy spurge management alternatives on pasture and rangeland. All experiments were established in late June and early July 1980 except the fall Valley City experiment which was established in September 1980. The herbicides in the study included 2,4-D, dicamba, picloram liquid (2S) and granular (2%G), and picloram applied using the roller and wick applicators. The conventional broadcast treatments were applied using a tractor mounted sprayer delivering 8 gpa water at 35 psi. A granular applicator was used to apply the picloram 2%G treatments. The roller and wick were adjusted to treat the top one-half of the taller leafy spurge stems. The wick was made of two 0.75 inch PVC pipes, with small holes covered with poly-foam and a 50% cotton:50% polyester canvas material. The additive in the roller and wick treatments was a 5% (v:v) oil concentrate (83% paraffin based petroleum oil plus 15% emulsifier). The plots at each site were 15 by 150 ft and replicated twice in a randomized complete block. Visual evaluations were based on percent stand reduction as compared to the control and were taken in the spring and fall of 1981. In 1981 (Year 2) each plot was divided into six 7.5 by 50 ft subplots for retreatments of 2,4-D, picloram 2S, dicamba or no retreatment. A second experiment was begun at Dickinson in August 1981, since the first experiment was established under atypical application conditions of extreme drought in 1980 and early 1981. Data from Dickinson are reported separately.

Treatment with 2,4-D at 2.0 lb/A did not provide long term leafy spurge control regardless of the 1981 retreatment applied (Table 1). Control in spring 1982 ranged from 45% at the spring Valley City site following a picloram + 2,4-D at 0.25 + 1.0 lb/A retreatment to 0% at Tolna and Minot with no retreatment.

Picloram 2%G at 2.0 lb/A provided 50% or more leafy spurge control at Sheldon and the spring Valley City site when evaluated after 24 months (Table 1). Picloram 2%G at 1.0 lb/A did not provide much long term leafy spurge control except at Sheyenne. Leafy spurge control generally increased 10 to 30% when the picloram 2%G at 1.0 and 2.0 lb/A treatments were retreated the second year with picloram at 0.25 lb/A or picloram + 2,4-D at 0.25 + 1.0 lb/A.

Picloram 2S at 2.0 lb/A without a Year 2 treatment provided 99, 97 and 94% leafy spurge control at Tolna, Sheyenne and Valley City (fall applied), respectively, but only 68 and 41% control at Sheldon and the spring Valley City site, respectively (Table 1). Retreatments of picloram at 0.25 lb/A and dicamba at 2.0 lb/A in 1981 increased the leafy spurge control by 20 to 50% over no retreatment at the Sheldon and spring Valley City sites. Picloram 2S at 1.0 lb/A provided leafy spurge control ranging from 88% at the fall Valley City site to 0% at Tolna and Minot after 24 months. However, fair to good leafy spurge control was maintained at all sites except Sheldon and Valley City (spring applied) with retreatments of dicamba at 2.0 lb/A, picloram at 0.25 lb/A and picloram + 2,4-D at 0.25 1.0 lb/A in 1981. Leafy spurge control with picloram at 1 and 2 lb/A usually was higher when applied as a postemergence liquid spray (picloram 2S) than as a granular treatment (picloram 2%G). These data suggest that foliar uptake and translocation of picloram are important for maximizing leafy spurge control with a given rate of picloram.

The roller application of picloram at 1:7 (v:v) with or without an oil concentrate generally provided poor leafy spurge control after 24 months except at the fall Valley City site (Table 1). No retreatment consistently resulted in improved leafy spurge control compared to the original roller treatment alone. Wick application of picloram at 1:3 (v:v) alone or with an oil concentrate additive did not provide long term leafy spurge control at any site. Retreatments of picloram at 0.25 lb/A in 1981 increased leafy spurge control to 70 and 80% at Tolna and the fall Valley City site, respectively, following an original wick treatment with picloram plus oil concentrate. Leafy spurge control was not increased similarly at the other sites with any follow-up treatment.

Dicamba at 4.0 and 8.0 lb/A was applied at the Tolna and Minot sites with varying results. Dicamba at 4.0 lb/A alone provided fair leafy spurge control at Tolna, if a retreatment was applied (Table 1). Leafy spurge control with dicamba at 8.0 lb/A alone ranged from 75% at Tolna to 0% at Minot and no retreatment provided increased control.

The retreatments applied alone in 1981 (control treatment in 1980) gave varying results. The retreatments of picloram at 0.25 lb/A and picloram + 2,4-D at 0.25 + 1.0 lb/A provided leafy spurge control of 35 and 44%, respectively, on the sandy soil of the Sheyenne National Grasslands, but did not provide good control at any other site. Dicamba at 2.0 lb/A provided 50% control after 12 months at Minot in north central North Dakota, but did not control leafy spurge at any of the eastern sites.

Leafy spurge control at Dickinson for the 1980 experiment was less for most treatments compared to any other site in North Dakota (Table 2). The total precipitation at this site in 1980 was 11.15 inches, a departure from normal of -6.4 inches. Thus the leafy spurge was under poor growing conditions which probably accounts for the reduced control by all treatments except picloram at 1.0 and 2.0 lb/A in 1981. Also, the leafy spurge was too short for adequate treatment when the roller and wick applications were used. A second experiment at Dickinson was started on 24 August 1981. The total precipitation for 1981 was 17.78 inches, a departure from normal of +0.23 inches. The leafy spurge was 16 to 18 inches tall with abundant fall growth during treatment. The dicamba treatment at 4.0 lb/A was increased to 6.0 lb/A, and the roller and wick applications of picloram with an oil concentrate were replaced with a treatment of picloram at 1:5 (v:v) for both applicators.

All treatments for the 1981 experiment at Dickinson gave good to excellent leafy spurge control except 2,4-D at 2.0 lb/A when evaluated in June 1982 (Table 2). The leafy spurge had excellent growing conditions with a cool moist spring and an average rainfall of 1.8 inches above normal. However leafy spurge control at 12 months after treatment decreased rapidly with all treatments except the wick application of picloram at 1:3 (v:v). Picloram 2S at 2.0 lb/A generally provides 90 to 100% leafy spurge control after 12 months but provided 0% control at the Dickinson site. The poor control observed after 12 months could not be attributed to poor moisture conditions in the year of treatment as in the previous experiment. Picloram at 1 and 2 lb/A generally provides good leafy spurge control in that area of the state and the reason for the poor control in this experiment is unknown.

Table 1. Leafy spurge control in a long term management study - 2 years after the initial treatment. (Messersmith and Lym).

Year one			Year two		Location						
Herbicide	Rate[a] (lb/A)	Soln conc	Herbicide	Rate (lb/A)	Shey-enne	Sheldon	Valley spring	City fall	Tolna	Minot	Avg
					(Percent control)						
2,4-D(LVE) (broadcast)	2.0	1:15	2,4-D(LVE)	1.0	14	6	16	4	20	0	10
			Dicamba	1.0	15	9	5	5	20	0	9
			Dicamba	2.0	6	6	15	8	30	0	11
			Picloram	0.25	40	14	34	16	40	25	28
			Picloram 2,4-D	0.25+1.0	31	20	45	17	40	25	30
			---	---	3	1	1	3	0	0	1
Picloram 2%G (granules)	1.0	----	2,4-D(LVE)	1.0	25	2	13	30	--	--	18
			Dicamba	1.0	48	3	11	5	--	--	17
			Dicamba	2.0	56	10	39	10	--	--	29
			Picloram	0.25	53	10	16	45	--	--	31
			Picloram 2,4-D	0.25+1.0	45	8	38	51	--	--	36
			---	---	28	4	4	8	--	--	11
Picloram 2%G (granules)	2.0	----	2,4-D(LVE)	1.0	50	50	88	27	--	--	54
			Dicamba	1.0	46	78	85	34	--	--	61
			Dicamba	2.0	47	50	88	42	--	--	57
			Picloram	0.25	71	56	95	52	--	--	69
			Picloram 2,4-D	0.25+1.0	82	73	91	24	--	--	68
			---	---	56	70	85	19	--	--	57
Picloram 2S (broadcast)	1.0	1:15	2,4-D(LVE)	1.0	26	10	23	100	20	0	30
			Dicamba	1.0	37	10	26	86	50	70	47
			Dicamba	2.0	59	14	39	98	60	90	60
			Picloram	0.25	69	13	39	82	50	80	56
			Picloram 2,4-D	0.25+1.0	45	18	51	94	60	95	61
			---	---	43	12	45	88	0	0	31
Picloram 2S (broadcast)	2.0	1:7	2,4-D(LVE)	1.0	95	65	85	93	99	98	89
			Dicamba	1.0	92	66	49	98	90	93	81
			Dicamba	2.0	96	88	85	96	99	99	94
			Picloram	0.25	97	86	93	97	90	95	93
			Picloram 2,4-D	0.25+1.0	96	62	72	92	99	97	86
			---	---	97	68	41	94	99	85	81
Picloram (Roller applied)	---	1:7	2,4-D(LVE)	1.0	56	10	9	4	10	5	14
			Dicamba	1.0	58	11	3	35	10	0	20
			Dicamba	2.0	59	17	7	13	0	0	16
			Picloram	0.25	45	24	24	30	10	35	28
			Picloram 2,4-D	0.25+1.0	68	19	14	79	10	5	33
			---	---	41	10	2	56	0	0	18

(continued)

Table 1. Continued (Messersmith and Lym).

Year one			Year two		Location						
Herbicide	Rate[a] (lb/A)	Soln conc	Herbicide	Rate (lb/A)	Shey-enne	Sheldon	Valley City spring	Valley City fall	Tolna	Minot	Avg
					(Percent control)						
Picloram oil conc (Roller applied)	---	1:7	2,4-D(LVE)	1.0	13	9	8	68	0	0	16
			Dicamba	1.0	25	4	7	58	0	0	16
			Dicamba	2.0	21	17	9	64	0	25	19
			Picloram	0.25	43	14	9	80	10	5	27
			Picloram 2,4-D	0.25+1.0	44	20	14	88	10	5	30
			---	---	11	9	0	83	10	0	19
Picloram (Wick applied)	---	1:3	2,4-D(LVE)	1.0	9	11	21	2	0	5	8
			Dicamba	1.0	9	11	10	8	10	5	9
			Dicamba	2.0	2	9	16	10	10	15	10
			Picloram	0.25	20	34	29	10	0	15	18
			Picloram 2,4-D	0.25+1.0	28	15	15	25	10	5	16
			---	---	13	10	13	7	0	5	8
Picloram oil conc (Wick applied)	---	1:3	2,4-D(LVE)	1.0	7	9	14	16	20	5	12
			Dicamba	1.0	5	7	42	43	0	0	16
			Dicamba	2.0	18	14	45	34	0	5	19
			Picloram	0.25	44	20	39	80	70	0	42
			Picloram 2,4-D	0.25+1.0	39	27	23	47	40	5	30
			---	---	2	5	36	8	20	0	12
Dicamba 4S (Broadcast)	4.0	1:7	2,4-D(LVE)	1.0	--	--	--	--	20	0	10
			Dicamba	1.0	--	--	--	--	50	0	25
			Dicamba	2.0	--	--	--	--	80	0	40
			Picloram	0.25	--	--	--	--	40	0	20
			Picloram 2,4-D	0.25+1.0	--	--	--	--	60	15	38
			---	---	--	--	--	--	20	0	10
Dicamba 4S (Broadcast)	8.0	1:3	2,4-D(LVE)	1.0	--	--	--	--	60	10	35
			Dicamba	1.0	--	--	--	--	30	15	23
			Dicamba	2.0	--	--	--	--	75	10	43
			Picloram	0.25	--	--	--	--	80	10	45
			Picloram 2,4-D	0.25+1.0	--	--	--	--	50	5	28
			---	---	--	--	--	--	75	0	38
Control	---	---	2,4-D(LVE)	1.0	2	5	5	1	0	10	12
			Dicamba	1.0	0	2	2	7	0	10	4
			Dicamba	2.0	2	8	8	5	0	50	12
			Picloram	0.25	35	7	7	5	10	15	13
			Picloram 2,4-D	0.25+1.0	44	10	12	13	20	10	18
			---	---	0	0	0	0	0	0	
LSD(0.05)					26	20	22	29	24	27	

[a] Herbicide:water (v:v).

Table 2. Leafy spurge control with various treatments at Dickinson, ND with experiments established on 10 July 1980 and 24 August 1981. (Messersmith and Lym).

Treatment	Rate[a]	Soln conc	Experiment 1980 25 Aug. 81	1980 16 June 82	1981 16 June 82	1981 9 Sept. 82
			(Percent control)			
2,4-D(LVE)	2.0	1:15	0	0	13	0
Picloram 2S	1.0	1:15	87	25	89	5
Picloram 2S	2.0	1:7	96	72	88	0
Picloram (Roller)		1:7	0	0	78	40
Picloram+oil conc (Roller)		1:7	28	0	--	--
Picloram (Roller)		1:5	--	--	93	60
Picloram (Wick)		1:5	--	--	87	50
Picloram (Wick)		1:3	0	0	99	88
Picloram+oil conc (Wick)		1:3	30	0	--	--
Dicamba 4S	4.0	1:7	51	0	--	--
Dicamba 4S	6.0	1:5	--	--	70	8
Dicamba 4S	8.0	1:3	35	0	80	5
LSD(0.05)			38	47	23	43

[a] Herbicide:water (v:v).

In summary, 2,4-D did not control leafy spurge either as a first year treatment at 2.0 lb/A or as a retreatment at 1.0 lb/A. Picloram 2%G at 2.0 lb/A did not provide good leafy spurge control after 24 months unless a picloram retreatment was applied after one year. Picloram 2S at 2.0 lb/A provided excellent leafy spurge control at most sites after 24 months especially when a retreatment was applied after 12 months. The roller and wick application of picloram provided poorer control than broadcast application. The poor results from these applicators may be due to the generally poor growing conditions of 1980 when many leafy spurge stems were too short for adequate treatment by the wiping applicators. Dicamba at 8.0 lb/A gave fair to poor leafy spurge control and control was not improved by any retreatments evaluated. As retreatments, dicamba at 2.0 lb/A and picloram at 0.25 lb/A with and without 2,4-D provided the best leafy spurge control. Retreatments with dicamba tended to be better in western North Dakota and with picloram tended to be better in eastern North Dakota. The reason for the poor leafy spurge control with all treatments at Dickinson probably can be attributed to poor growing conditions for the 1980 experiment but the cause is not known for the experiment established in 1981.

Forage production in pasture and rangeland following three years of leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. An experiment to evaluate long term leafy spurge management with resulting forage production was established at four sites in North Dakota in 1980. The sites included a bluegrass pasture near Sheldon, an exclosure area on the Sheyenne National Grasslands near McLeod, and two sites on a federal game management area near Valley City. The main population of grasses was bluegrass (Poa spp.) with occasional crested wheatgrass, smooth brome, big bluestem or other native grasses. All sites were established in early June except one site at Valley City which was established in September 1980 (Table 3). The herbicides applied in 1980 (Year 1) included 2,4-D, dicamba, picloram liquid (2S), picloram granule (2%G), and picloram applied using the roller and wick applicators. The conventional broadcast treatments were applied using a tractor mounted sprayer delivering 8 gpa water at 35 psi. A granular applicator was used to apply the picloram 2%G treatments. The roller and wick applicator height was adjusted to treat the top one-half of the taller leafy spurge stems. The additive in the roller and wick treatments was a 5% (v:v) oil concentrate (83% paraffin based petroleum oil plus 15% emulsifier). The plots were 15 by 150 ft and replicated twice at each site in a randomized complete block design. In 1981 (Year 2) each plot was divided into six 7.5 by 50 ft subplots for retreatments of 2,4-D, picloram 2S, dicamba or no retreatment. Retreatments were applied in June 1982 (Year 3) at Sheldon and the fall Valley City site and in August 1982 at the Sheyenne and spring Valley City sites. In July 1981, a 3 by 25 ft section of each plot was harvested with a flail mower. A 4 by 15 ft section of each plot was harvested at Sheldon and the fall Valley City sites with a rotary mower. Sub-samples were taken by hand along each harvested strip so that leafy spurge and forage weight could be separated. The samples were oven dried and are reported with 12% moisture content.

Picloram 2%G and 2S at 2 lb/A provided the best leafy spurge control after 27 months averaging 43 and 40% control, respectively, without a retreatment, and up to 90% control with a retreatment of dicamba at 2.0 lb/A (Table 1). No other original treatment provided satisfactory leafy spurge control by August 1982 without a retreatment. The best retreatments for leafy spurge control were dicamba at 2.0 lb/A, picloram 2S at 0.25 lb/A alone or in combination with 2,4-D at 2.0 lb/A which provided 61, 59 and 53% control, respectively, when averaged across all original treatments. Retreatments of dicamba at 1.0 lb/A or 2,4-D at 1.0 lb/A did not improve control compared to no retreatment.

Forage yield increased significantly for 20 of the 59 treatments compared to the control in 1982 which is a decrease from 50 of the 59 treatments in 1981. (1981 N.D. Weed Control Research p 1-2). The forage yield in the check plots averaged 1491 lb/A in 1982 compared to 623 lb/A in 1981. This increase in production probably was due to a cool moist spring which allowed the cool season grasses to compete more effectively with leafy spurge. Also, it was observed that there was more grass in the control plots than in the areas adjacent to the experiment, so the increase in forage production due to herbicide treatment may be underestimated. A possible explanation is that each year the entire experiment is mowed to remove dead leafy spurge stems and other plant material. The removal of the trash may allow the native grasses to better compete with leafy spurge.

The five treatments which resulted in the highest yields were: picloram 2S at 2.0 lb/A plus dicamba at 1.0 lb/A, roller applied picloram at 1:7 (v:v) plus picloram at 0.25 lb/A, picloram 2%G at 1.0 plus (picloram + 2,4-D at 0.25 + 1.0 lb/A), wick applied picloram at 1:3 (v:v) plus 2,4-D at 1.0 lb/A, and control plus dicamba at 2.0 lb/A (Table 1). The treatment with the best overall leafy spurge control was picloram 2S at 1.0 lb/A plus dicamba at 2.0 lb/A but the forage yield was intermediate at 1760 lb/A. Picloram at 1:7 (v:v) applied with the roller applicator resulted in the highest forage production at 2,252 lb/A when averaged across all retreatments. All retreatments increased forage production significantly compared to the control when averaged across all original treatments except picloram at 0.25 lb/A plus 2,4-D at 1.0 lb/A.

Plots at the Sheyenne National Grassland and the second Valley City site were retreated in August rather than in June 1982 so a fall versus spring comparison of the various retreatment programs could be made. Thus forage samples were not taken in 1982 and the data reported are leafy spurge control 27 months after the original treatment with one retreatment in June 1981 (Table 2). Picloram 2%G and 2S at 2 lb/A provided fair leafy spurge control after 27 months averaging 52 and 49% respectively without a retreatment and up to 81% with a retreatment of picloram at 0.25 lb/A. The best retreatments were dicamba at 2.0 lb/A, picloram 2S at 0.25 alone or in combination with 2,4-D at 1.0 which provided 23, 27 and 28% leafy spurge control, respectively, when averaged across the original treatments.

All original treatments applied in 1980 required retreatments in 1981 and 1982 to maintain good leafy spurge control. The best retreatments for both good leafy spurge control and high forage production were picloram 2S at 0.25 lb/A or dicamba at 2.0 lb/A applied annually. The most economical long term treatment was picloram 2S at 0.25 lb/A in years 2 and 3 without a year one treatment which resulted in 63% leafy spurge control and 2409 lb/A forage production. Picloram at 2.0 lb/A will give good leafy spurge control for up to three years in areas where yearly treatments are unfeasible.

Table 1. Leafy spurge control in August 1982 and forage production in July 1982 at Sheldon and Valley City, ND after treatments applied in 1980, 1981, and 1982. (Lym and Messersmith).

Year one treatment	Rate[a] (lb/A)	Soln conc	Years two and three treatment/rate (lb/A) 2,4-D 1.0	Dicamba 1.0	Dicamba 2.0	Picloram 0.25	Picloram +2,4-D 0.25+1.0	Control 0	Mean
			(Percent control)						
2,4-D	2.0	1:15	4	33	48	56	48	12	33
Picloram 2%G	1.0	----	7	28	60	65	45	16	36
Picloram 2%G	2.0	----	33	52	65	66	63	43	53
Picloram 2S	1.0	1:15	52	43	91	47	56	34	54
Picloram 2S	2.0	1:7	72	77	90	67	69	48	71
Picloram(Roller)		1:7	5	30	51	50	41	3	30
Picloram+oil conc.(Roller)		1:7	26	47	63	62	63	29	50
Picloram(Wick)		1:3	12	11	48	52	35	4	30
Picloram+oil conc.(Wick)		1:3	2	49	42	67	75	15	41
Control	---	----	19	29	42	63	26	0	33
Mean			24	42	61	59	53	20	

LSD(0.05):Yr 1=12; Yr 2&3=9; Yr 1 x (Yr 2 & Yr 3)=29

			(1982 yield lb/A)						
2,4-D	2.0	1:15	1928	1324	2429	2242	1251	1460	1772
Picloram 2%G	1.0	----	1759	1292	1525	2119	2825	1944	1911
Picloram 2%G	2.0	----	2457	2430	1719	1812	968	1297	1781
Picloram 2S	1.0	1:15	1322	3029	1760	1296	2386	1697	1915
Picloram 2S	2.0	1:7	1492	1542	1763	1548	2132	1434	1650
Picloram (Roller)		1:7	2306	2265	1752	3009	1909	2280	2252
Picloram+oil conc. (Roller)		1:7	1120	1358	1478	1213	1024	2020	1368
Picloram (Wick)		1:3	2660	1549	1835	2383	1296	1341	1842
Picloram+oil conc. (Wick)		1:3	1773	1495	1684	1024	1392	1061	1405
Control	---	----	2148	1819	2620	2409	2216	1491	2084
Mean			1890	1810	1836	1892	1727	1603	

LSD(0.05)=Yr 1=228; Yr 2&3=179; Yr 1 x (Yr 2 & Yr 3)=555

[a] Broadcast in 8 gpa except when identified as roller or wick applied.

Table 2. Leafy spurge control in August 1982 with various herbicide treatments at the Sheyenne National Grasslands and Valley City, ND after treatments applied June of 1980 and 1981. (Lym and Messersmith).

Year one treatment	Rate[a] (lb/A)	Soln conc	Year two treatment/rate (lb/A) 2,4-D 1.0	Dicamba 1.0	Dicamba 2.0	Picloram 0.25	Picloram +2,4-D 0.25+1.0	Control 0	Mean
			(Percent control)						
2,4-D	2.0	1:15	6	6	1	10	21	0	7
Picloram 2%G	1.0	----	16	21	13	19	29	6	17
Picloram 2%G	2.0	----	44	30	49	49	54	52	49
Picloram 2S	1.0	1:15	43	12	27	36	20	23	24
Picloram 2S	2.0	1:7	63	65	74	81	58	49	65
Picloram (Roller)		1:7	23	31	32	25	38	12	27
Picloram+oil conc. (Roller)		1:7	17	19	13	15	16	0	13
Picloram (Wick)		1:3	2	2	5	6	12	2	5
Picloram+oil conc. (Wick)		1:3	4	8	19	17	14	21	13
Control	---	----	0	0	0	22	18	0	5
Mean			20	20	23	27	28	16	

LSD(0.05)=Yr 1=7; Yr 2=5; Yr 1 x Yr 2=17

[a] Broadcast in 8 gpa except when identified as roller or wick applied.

Table 3. Herbicide application and harvest dates at various sites of a long term leafy spurge management study. (Lym and Messersmith).

Location	Original treatment in year 1	Retreatment Year 2	Retreatment Year 3	Harvest Year 2	Harvest Year 3
Sheyenne National Grasslands	11 June 80	27 May 81	17 Aug. 82	20 July 81	----------
Sheldon	16 June 80	4 June 81	10 June 82	6 July 81	12-13 July 82
Valley City (Spring)	26 June 80	23 June 81	11 June 82	9 July 81	15 July 82
Valley City (Fall)	2-3 Sept. 80	23 June 81	24 Aug. 82	10 July 81	

Leafy spurge control by glyphosate using three application techniques. Lym, Rodney G. and Calvin G. Messersmith. An experiment to evaluate leafy spurge control by glyphosate applied by three techniques was established near Walcott, ND on August 1, 1980. The leafy spurge was 18 to 20 inches tall and had begun new fall growth. The temperature was 83 F, 66% relative humidity, the sky was overcast, and the soil temperature at 1 inch was 81 F. Glyphosate was applied with a tractor mounted sprayer that delivered 8.5 gpa at 35 psi, a controlled droplet applicator (CDA) which delivered approximately 0.85 gpa, and with a pipe wick applicator which delivered approximately 2.25 gpa depending upon stand density. The plots were 10 by 30 ft in a randomized complete block design with three replications. Evaluations were based on stand reduction as compared to the control.

Method	Solution		Control		
	Ratio	lb/A	May 1981	Aug. 1981	June 1982
Broadcast	1:11	(2.0)	98	88	8
Broadcast	1:23	(1.0)	98	83	10
Broadcast	1:31	(0.75)	95	78	12
CDA	1:11	(0.2)	78	55	0
CDA	1:23	(0.1)	31	28	0
CDA	1:31	(0.075)	56	25	0
Wick	1:11	(0.5)	85	79	13
Wick	1:23	(0.25)	80	40	0
Wick	1:31	(0.125)	69	8	2
LSD(0.05)			33	38	7

[a] Glyphosate (Roundup):water (v:v).

Glyphosate at 0.75, 1.0 and 2.0 lb/A broadcast applied provided 95, 98, and 98%, leafy spurge control, respectively, when evaluated in May 1981. The perennial plants in these plots had been killed and a thick mat of leafy spurge seedlings had developed. Most of the seedlings died by August 19, but enough seedlings survived so that the overall control declined 10 to 17%. By June of 1982 there was essentially no leafy spurge control at any rate or method of application.

Glyphosate provided better leafy spurge control when broadcast than CDA or wick applied. However, the grass in these plots was not severely damaged and provided competition for emerging seedlings. Although the glyphosate rate actually applied had been reduced approximately 90 and 25% with the CDA and wick applicators, respectively, leafy spurge control was not decreased by a similar magnitude. A follow-up treatment is needed to control leafy spurge seedlings regardless of the glyphosate application technique.

Tebuthiuron applied spring and fall for leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. An experiment was established near Valley City, ND to evaluate tebuthiuron for leafy spurge control. Tebuthiuron as 10 or 20% pellets was applied by hand as spring or fall treatments. The fall treatments were applied on 25 September 1980 when the leafy spurge had vigorous fall growth from previous fall rains. The summer had been very dry and the plants had been drought stressed for most of the growing season. The spring application was made on 18 May 1981 when the soil was very dry, the leafy spurge was 2 to 4 inches tall and emerged stems were sparse. The experimental plots were 10 by 20 ft and replicated twice in a randomized complete block design. Evaluations are based on percent stand reduction as compared to the control and data are shown in the table.

Time of application	Tebuthiuron pellet formulation	Rate (lb/A)	Control Sept 81	Control June 82	Grass Injury June 82
	----(%)----		----------(%)----------		
Fall	10	0.5	0	53	35
Fall	10	1.0	35	34	90
Fall	10	1.5	10	33	70
Fall	20	0.5	30	0	40
Fall	20	1.0	95	49	25
Fall	20	1.5	58	86	25
Spring	10	0.5	0	10	45
Spring	10	1.0	0	16	70
Spring	10	1.5	0	5	20
Spring	20	0.5	35	48	5
Spring	20	1.0	10	50	40
Spring	20	1.5	73	50	7
LSD(0.05)			56	107	

Leafy spurge control with tebuthiuron varied widely within most treatments. The only treatment that provided good leafy spurge control after two years was tebuthiuron 20%G at 1.5 lb/A fall applied which gave 86% control. Other treatments did provide over 90% control in one replication, but nearly zero in the other. Tebuthiuron severely damaged the grasses at all rates of application especially when the 10%G formulation was used. The large variation in leafy spurge control by tebuthiuron could be due to the dryness the year in which the experiment was established. However, the severe damage to the native grasses probably makes tebuthiuron unsuitable for leafy spurge control in most situations.

Fall applied fallow herbicides, Fargo 1981-82. Treatments were applied October 20 to soil with 3000 lb/A of wheat stubble using a bicycle wheel sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.22 inch. The back half of each plot was treated with glyphosate plus dicamba (3+2 oz/A) using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi on May 26. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 30 ft. Weed densities were moderate to heavy and were evaluated for control June 25.

Treatment	Rate lb/A	Percent Control June 25							
						Glyp+Dica			
		Wioa	Wimu	Colq	Kocz	Wioa	Wimu	Colq	Kocz
Cyanazine-W	2.5	8	95	98	100	98	100	100	100
Chlorsulfuron	0.03	44	100	100	100	100	100	100	100
Chlorsulfuron	0.06	51	100	100	100	100	100	100	100
Chlorsulfuron	0.09	80	100	100	100	100	100	100	100
EL-187	0.4	3	89	100	95	97	100	100	100
EL-187	0.5	43	99	100	100	98	100	100	100
EL-187	0.6	33	93	100	98	99	100	100	100
Cyanazine-W+Atrazine-W	2.5+0.5	28	100	100	100	97	100	100	100
Cyanazine-W+Atrazine+Propham	2.5+0.5+3	20	100	100	100	97	100	100	100
Cyanazine-W+Metribuzin-W	2.5+0.5	10	98	100	100	98	100	100	100
Cyanazine-W+Terbutryn	2.5+2	14	99	100	100	98	100	100	100
Cyanazine-W+EL-187	2.5+0.5	69	100	100	100	98	100	100	100
Cyanazine-W+Chlorsulfuron	2.5+0.03	54	100	100	100	100	100	100	100
Chlorsulfuron+Atrazine-W	0.03+0.5	51	100	100	100	100	100	100	100
Chlorsulfuron+Metribuzin-W	0.03+0.5	54	100	100	100	100	100	100	100
Chlorsulfuron+Terbutryn	0.03+2	59	100	100	100	100	100	100	100
Chlorsulfuron+EL-187	0.03+0.5	69	100	100	100	100	100	100	100
Chlorsulfuron+Propham	0.03+3	58	100	100	100	100	100	100	100
EL-187+Atrazine-W	0.5+0.5	18	98	100	100	97	100	100	100
EL-187+Atrazine-W+Propham	0.5+0.5+3	45	100	100	100	99	100	100	100
EL-187+Metribuzin-W	0.5+0.5	55	100	100	100	98	100	100	100
EL-187+Terbutryn	0.5+2	15	100	100	98	98	100	100	100
Metribuzin-W+Atrazine-W	0.5+0.5	8	100	100	100	99	100	100	100
Terbutryn+Atrazine-W	2+0.5	5	100	100	100	97	100	100	100
Terbutryn+Atrazine-W+Propham	2+0.5+3	13	98	100	100	99	100	100	100
Terbutryn+Metribuzin-W	2+0.5	18	94	98	100	98	100	100	100
Terbutryn+Metolachlor+Atrazine	2+2+0.5	14	95	100	100	99	100	100	100
Hexazinone+Diuron	0.5+1	35	100	100	100	100	100	100	100
Hexazinone+Chlorsulfuron	0.5+0.03	71	100	100	100	100	100	100	100
Buthidazole+Chlorsulfuron	0.75+0.03	62	100	100	100	100	100	100	100
Buthidazole+Metribuzin-W	0.75+0.5	59	100	100	100	99	100	100	100
Control		0	0	0	0	92	100	100	100
Mean		36	95	97	97	99	100	100	100
High mean		80	100	100	100	100	100	100	100
Low mean		0	0	0	0	92	100	100	100
Coeff. of variation		49	3	1	2	2	0	0	0
LSD(1 Percent)		33	6	2	3	3	0	0	0
LSD(5 Percent)		25	4	2	2	2	0	0	0
No. of reps		4	4	4	4	4	4	4	4

Summary

Broadleaf weed control generally was good and wild oat control poor with fall applied fallow herbicides. The application of glyphosate and dicamba across the back half of the plot May 26 resulted in excellent wild oat control.

Fall applied fallow herbicides, Fargo 1981-82. Treatments were applied October 20 to soil with 3000 lb/A of wheat stubble using a bicycle wheel plot sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.22 inch. The back half of each plot was treated with glyphosate plus dicamba (3+2 oz/A) using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi on May 26. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 30 ft. Weed densities were moderate to heavy and were evaluated for control July 18.

		Percent Control									
							Glyp&Dica				
Treatment	Rate lb/A	Wioa	Wimu	Colq	Kocz	Fxtl	Wioa	Wimu	Colq	Kocz	Fxtl
Cyanazine-W	2.5	5	96	100	100	0	96	98	100	100	10
Chlorsulfuron	0.03	23	100	100	100	99	73	100	100	100	100
Chlorsulfuron	0.06	35	100	100	100	98	99	100	100	100	99
Chlorsulfuron	0.09	56	100	100	100	100	99	100	100	100	100
EL-187	0.4	0	100	100	100	0	92	100	100	100	10
EL-187	0.5	10	100	100	100	13	98	100	100	100	28
EL-187	0.6	15	100	100	100	40	93	100	100	100	43
Cyanazine-W+Atrazine-W	2.5+0.5	14	100	100	100	13	98	100	100	100	13
Cyanazine-W+Atrazine+Propham	2.5+0.5+3	10	98	100	100	8	99	99	100	100	13
Cyanazine-W+Metribuzin-W	2.5+0.5	0	100	100	100	23	96	100	100	100	23
Cyanazine-W+Terbutryn	2.5+2	0	93	100	100	0	94	95	100	100	0
Cyanazine-W+EL-187	2.5+0.5	10	100	100	100	23	96	100	100	100	23
Cyanazine-W+Chlorsulfuron	2.5+0.03	28	100	100	100	98	99	100	100	100	99
Chlorsulfuron+Atrazine-W	0.03+0.5	20	100	100	100	91	96	100	100	100	96
Chlorsulfuron+Metribuzin-W	0.03+0.5	23	100	100	100	100	99	100	100	100	100
Chlorsulfuron+Terbutryn	0.03+2	15	100	100	100	100	99	100	100	100	100
Chlorsulfuron+EL-187	0.03+0.5	31	100	100	100	100	99	100	100	100	100
Chlorsulfuron+Propham	0.03+3	31	100	100	100	100	97	100	100	100	100
EL-187+Atrazine-W	0.5+0.5	0	98	100	98	33	95	98	100	100	34
EL-187+Atrazine-W+Propham	0.5+0.5+3	8	100	100	100	45	95	100	100	100	48
EL-187+Metribuzin-W	0.5+0.5	28	100	100	100	35	95	100	100	100	45
EL-187+Terbutryn	0.5+2	5	98	100	100	15	95	98	100	100	15
Metribuzin-W+Atrazine-W	0.5+0.5	0	100	100	100	13	94	100	100	100	15
Terbutryn+Atrazine-W	2+0.5	0	100	100	100	0	94	100	100	100	10
Terbutryn+Atrazine-W+Propham	2+0.5+3	5	98	100	100	25	96	98	100	100	25
Terbutryn+Metribuzin-W	2+0.5	0	98	100	100	38	97	100	100	100	40
Terbutryn+Metolachlor+Atrazine	2+2+0.5	0	100	100	100	5	96	100	100	100	5
Hexazinone+Diuron	0.5+1	10	100	100	100	58	96	100	100	100	55
Hexazinone+Chlorsulfuron	0.5+0.03	38	100	100	100	100	99	100	100	100	100
Buthidazole+Chlorsulfuron	0.75+0.03	28	100	100	100	100	99	100	100	100	100
Buthidazole+Metribuzin-W	0.75+0.5	40	100	100	100	53	97	100	100	100	50
Control		0	0	0	0	0	88	83	100	100	0
Mean		15	96	97	97	48	95	99	100	100	50
High mean		56	100	100	100	100	99	100	100	100	100
Low mean		0	0	0	0	0	73	83	100	100	0
Coeff. of variation		91	2	0	1	39	10	4	0	0	41
LSD(1 Percent)		25	4	0	2	35	17	6	0	0	37
LSD(5 Percent)		19	3	0	1	26	13	5	0	0	28
No. of reps		4	4	4	4	4	4	4	4	4	4

Summary

Foxtail control was good to excellent with chlorsulfuron alone or in combination with other herbicides. Broadleaf weed control generally was good and wild oat control poor with fall applied fallow herbicides. The application of glyphosate and dicamba across the back half of the plot May 26 resulted in excellent wild oat control.

Fall applied fallow herbicides, Minot 1981-82. Treatments were applied October 26 to soil with 1500 lb/A of wheat stubble using a bicycle wheel plot sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.07 inch. The back half of each plot was treated with glyphosate plus dicamba (3+2 oz/A) using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi on June 3. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 30 ft. Weed densities were moderate and were evaluated for control July 21.

Treatment	Rate lb/A	Percent Control									
							-----Glyp+Dica-----				
		Fxtl	Kocz	Ruth	Colq	Prpw	Fxtl	Kocz	Ruth	Colq	Prpw
Cyanazine-W	2.5	20	95	70	80	85	33	100	80	98	98
Chlorsulfuron	0.03	79	99	99	100	78	97	100	100	100	100
Chlorsulfuron	0.06	88	100	100	100	100	97	100	100	100	100
Chlorsulfuron	0.09	98	100	100	100	100	99	100	100	100	100
EL-187	0.4	35	78	43	93	98	59	98	91	100	100
EL-187	0.5	65	80	35	88	100	79	100	98	100	100
EL-187	0.6	89	90	46	100	100	91	100	100	100	100
Cyanazine-W+Atrazine-W	2.5+0.5	56	98	73	94	95	65	100	99	100	98
Cyanazine-W+Atrazine+Propham	2.5+0.5+3	41	100	83	91	88	63	100	99	100	100
Cyanazine-W+Metribuzin-W	2.5+0.5	68	100	84	90	100	75	100	100	100	100
Cyanazine-W+Terbutryn	2.5+2	23	100	76	93	88	43	100	96	99	95
Cyanazine-W+EL-187	2.5+0.5	70	100	66	91	100	95	100	98	100	100
Cyanazine-W+Chlorsulfuron	2.5+0.03	91	100	100	100	100	96	100	100	100	100
Chlorsulfuron+Atrazine-W	0.03+0.5	83	100	100	100	100	92	100	100	100	100
Chlorsulfuron+Metribuzin-W	0.03+0.5	81	100	99	100	100	90	100	100	100	100
Chlorsulfuron+Terbutryn	0.03+2	76	100	100	100	100	91	100	100	100	100
Chlorsulfuron+EL-187	0.03+0.5	96	100	100	100	100	99	100	100	100	100
Chlorsulfuron+Propham	0.03+3	65	100	81	86	98	76	100	96	98	100
EL-187+Atrazine-W	0.5+0.5	78	100	75	95	98	90	100	99	100	98
EL-187+Atrazine-W+Propham	0.5+0.5+3	65	100	85	100	96	83	100	99	100	99
EL-187+Metribuzin-W	0.5+0.5	74	100	90	95	100	88	100	100	100	100
EL-187+Terbutryn	0.5+2	87	98	75	100	98	90	100	97	100	100
Metribuzin-W+Atrazine-W	0.5+0.5	46	100	86	98	100	52	100	99	100	100
Terbutryn+Atrazine-W	2+0.5	33	95	78	80	95	33	100	96	98	100
Terbutryn+Atrazine-W+Propham	2+0.5+3	48	100	76	89	89	63	100	98	100	99
Terbutryn+Metribuzin-W	2+0.5	59	100	88	95	98	73	100	99	100	100
Terbutryn+Metolachlor+Atrazine	2+2+0.5	44	100	75	88	98	68	100	98	100	99
Hexazinone+Diuron	0.5+1	68	98	73	85	99	81	100	95	99	99
Hexazinone+Chlorsulfuron	0.5+0.03	94	100	100	100	100	98	100	100	100	100
Buthidazole+Chlorsulfuron	0.75+0.03	89	100	100	100	100	95	100	100	100	100
Buthidazole+Metribuzin-W	0.75+0.5	83	100	93	95	100	89	100	98	100	100
Control		0	0	0	0	0	4	98	91	96	88
Mean		65	95	80	91	94	76	100	98	100	99
High mean		98	100	100	100	100	99	100	100	100	100
Low mean		0	0	0	0	0	4	98	80	96	88
Coeff. of variation		29	6	15	10	10	24	1	6	2	2
LSD(1 Percent)		35	11	22	16	18	34	2	11	3	4
LSD(5 Percent)		27	8	17	12	13	26	2	8	3	3
No. of reps		4	4	4	4	4	4	4	4	4	4

Summary

Broad spectrum weed control was generally good to excellent with chlorsulfuron alone or in combination with other fall applied herbicides. The application of glyphosate and dicamba across the back half of the plot June 3 increased foxtail and broadleaf weed control with fall treatments.

Fall applied fallow herbicides, Williston 1981-82. Treatments were applied October 27 to soil with 3500 lb/A of wheat stubble using a bicycle wheel plot sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.06 inch. The back half of each plot was treated with glyphosate (3 oz/A) using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi on June 4. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 30 ft. Weed densities were moderate and were evaluated for control July 15.

		Percent Control							
						Glyphosate			
Treatment	Rate lb/A	Fxtl	Ruth	Tamu	Vwht	Fxtl	Ruth	Tamu	Vwht
Cyanazine-W	2.5	0	28	100	33	40	64	100	100
Chlorsulfuron	0.03	58	100	100	0	88	100	100	97
Chlorsulfuron	0.06	58	93	100	8	94	100	100	100
Chlorsulfuron	0.09	96	93	100	25	98	100	100	98
EL-187	0.4	39	5	98	84	65	30	100	100
EL-187	0.5	35	35	100	90	63	69	100	100
EL-187	0.6	68	3	100	94	70	35	100	100
Cyanazine-W+Atrazine-W	2.5+0.5	3	45	100	64	18	50	100	100
Cyanazine-W+Atrazine+Propham	2.5+0.5+3	30	40	100	100	36	81	100	100
Cyanazine-W+Metribuzin-W	2.5+0.5	13	8	100	93	25	40	100	100
Cyanazine-W+Terbutryn	2.5+2	0	56	100	25	24	74	100	100
Cyanazine-W+EL-187	2.5+0.5	49	53	100	100	59	59	100	100
Cyanazine-W+Chlorsulfuron	2.5+0.03	38	93	100	30	80	98	100	100
Chlorsulfuron+Atrazine-W	0.03+0.5	26	96	100	5	55	99	100	98
Chlorsulfuron+Metribuzin-W	0.03+0.5	40	90	100	43	66	95	100	100
Chlorsulfuron+Terbutryn	0.03+2	49	100	100	0	69	100	100	100
Chlorsulfuron+EL-187	0.03+0.5	89	96	100	96	95	100	100	100
Chlorsulfuron+Propham	0.03+3	20	91	100	100	78	100	100	100
EL-187+Atrazine-W	0.5+0.5	30	33	100	88	46	33	100	100
EL-187+Atrazine-W+Propham	0.5+0.5+3	44	45	100	100	70	73	100	100
EL-187+Metribuzin-W	0.5+0.5	31	30	100	100	64	185	100	100
EL-187+Terbutryn	0.5+2	30	39	99	100	68	73	100	100
Metribuzin-W+Atrazine-W	0.5+0.5	8	48	100	96	35	48	100	100
Terbutryn+Atrazine-W	2+0.5	9	68	91	91	38	88	100	100
Terbutryn+Atrazine-W+Propham	2+0.5+3	0	26	74	65	18	44	100	100
Terbutryn+Metribuzin-W	2+0.5	0	70	100	90	0	76	100	99
Terbutryn+Metolachlor+Atrazine	2+2+0.5	39	45	100	55	60	61	100	100
Hexazinone+Diuron	0.5+1	57	18	100	100	70	35	100	100
Hexazinone+Chlorsulfuron	0.5+0.03	61	96	100	96	88	100	100	100
Buthidazole+Chlorsulfuron	0.75+0.03	91	100	100	93	96	100	100	100
Buthidazole+Metribuzin-W	0.75+0.5	84	61	100	100	91	85	100	100
Control		0	0	0	0	40	43	63	100
Mean		37	56	96	67	59	76	99	100
High mean		96	100	100	100	98	185	100	100
Low mean		0	0	0	0	0	30	63	97
Coeff. of variation		72	38	9	37	36	77	9	1
LSD(1 Percent)		49	40	16	46	40	109	16	3
LSD(5 Percent)		37	30	12	35	30	82	12	2
No. of reps		4	4	4	4	4	4	4	4

Summary

Broad spectrum weed control was good with EL-187 in combination with chlorsulfuron and buthidazole in combination with chlorsulfuron or metribuzin. The application of glyphosate across the back half of the plot on June 4 resulted in excellent volunteer wheat control.

Fall applied fallow herbicides, Devils Lake 1981-82. Treatments were applied November 12 to soil with 2000 lb/A of barley stubble using a bicycle wheel plot sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.87 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were heavy and were evaluated for control July 26.

Treatment	Rate lb/A	Percent Control							
		Kocz	Tamu	Grft	Biwo	Wioa	Wibw	Vbly	Pest
Cyanazine-W	2.5	71	70	18	88	29	63	0	0
Chlorsulfuron	0.03	91	85	70	96	8	68	0	15
Chlorsulfuron	0.06	100	100	84	100	8	100	5	59
Chlorsulfuron	0.09	98	100	97	100	30	99	13	71
EL-187	0.4	25	43	35	63	18	38	5	0
EL-187	0.5	40	79	78	78	60	55	5	0
EL-187	0.6	43	81	80	75	73	65	5	0
Cyanazine-W+Atrazine-W	2.5+0.5	90	95	59	89	51	93	0	0
Cyanazine-W+Atrazine+Propham	2.5+0.5+3	80	85	46	93	71	79	18	0
Cyanazine-W+Metribuzin-W	2.5+0.5	86	98	48	95	53	89	5	0
Cyanazine-W+Terbutryn	2.5+2	83	90	33	88	79	75	5	0
Cyanazine-W+EL-187	2.5+0.5	80	95	69	99	88	85	15	10
Cyanazine-W+Chlorsulfuron	2.5+0.03	100	100	81	78	88	100	5	58
Chlorsulfuron+Atrazine-W	0.03+0.5	100	100	81	100	55	100	0	50
Chlorsulfuron+Metribuzin-W	0.03+0.5	99	99	65	100	69	98	13	48
Chlorsulfuron+Terbutryn	0.03+2	100	100	89	100	70	95	5	50
Chlorsulfuron+EL-187	0.03+0.5	99	100	90	98	68	100	5	48
Chlorsulfuron+Propham	0.03+3	100	100	88	100	65	78	10	30
EL-187+Atrazine-W	0.5+0.5	83	88	74	89	68	81	0	10
EL-187+Atrazine-W+Propham	0.5+0.5+3	73	85	75	85	76	78	13	5
EL-187+Metribuzin-W	0.5+0.5	70	85	75	80	63	78	0	10
EL-187+Terbutryn	0.5+2	54	81	70	90	53	70	0	0
Metribuzin-W+Atrazine-W	0.5+0.5	70	83	30	93	53	73	0	10
Terbutryn+Atrazine-W	2+0.5	86	98	13	83	38	71	0	10
Terbutryn+Atrazine-W+Propham	2+0.5+3	83	99	70	93	75	78	0	20
Terbutryn+Metribuzin-W	2+0.5	93	98	61	95	50	88	0	0
Terbutryn+Metolachlor+Atrazine	2+2+0.5	76	83	76	88	63	75	5	5
Hexazinone+Diuron	0.5+1	68	85	78	88	45	78	10	5
Hexazinone+Chlorsulfuron	0.5+0.03	99	100	85	100	79	100	5	45
Buthidazole+Chlorsulfuron	0.75+0.03	98	100	81	98	64	98	25	58
Buthidazole+Metribuzin-W	0.75+0.5	90	95	74	93	65	85	20	10
Control		0	0	0	0	0	0	0	0
Mean		79	87	65	88	55	79	6	20
High mean		100	100	97	100	88	100	25	71
Low mean		0	0	0	0	0	0	0	0
Coeff. of variation		18	17	34	15	36	20	223	73
LSD(1 Percent)		26	27	41	24	37	29	24	26
LSD(5 Percent)		20	21	31	18	28	22	18	20
No. of reps		4	4	4	4	4	4	4	4

Summary

No fall applied treatment adequately controlled volunteer barley or perennial sow thistle. Broadleaf and foxtail control was good with 0.06 lb/A chlorsulfuron alone or 0.03 lb/A in combination with other herbicides. Cyanazine combinations with EL-187 or chlorsulfuron were the only treatments which gave 80% or better wild oat control.

Herbicide systems for weed control in fallow, Devils Lake 1982. Treatments were applied on tilled or untilled wheat stubble Oct 20, June 14 (weeds 1 to 4 inch), or July 12 (weeds 4 to 12 inch) with a back pack sprayer delivering 17 gpa at 30 psi. The soil was a sandy loam pH 8.0 and 4.0% organic matter. The experiment was a randomized complete block with a split block arrangement and experimental units 7 by 20 ft. Weed densities were moderate and control ratings made July 26.

			Percent Control											
	Rate	App.	Non-Tilled						Tilled					
Treatment	lb/A	Date	Wioa	Wimu	Kocz	Biwm	Wibw	Grft	Wioa	Wimu	Kocz	Biwm	Wibw	Grft
Atra	8	Oct												
Clsu+Glyp	0.33+3	June	99	100	100	99	85	90	95	100	99	100	93	90
Atra	8	Oct												
Glyp+2,4-D	3+12	July	97	100	100	97	97	96	94	99	99	100	95	93
Clsu	0.66	Oct												
Glyp+2,4-D	3+12	July	90	100	100	100	100	95	99	100	100	100	100	97
Clsu	0.66	June												
Glyp+2,4-D	3+12	July	99	100	99	99	90	98	98	100	96	99	90	97
Clsu+Glyp	0.33+3	June												
Glyp+2,4-D	3+12	July	95	100	99	100	90	90	95	100	99	100	85	90
Clsu+Glyp	0.16+3	June												
Glyp+2,4-D	3+12	July	97	100	100	92	94	92	95	100	99	92	75	85
Clsu+Terb	.33+24	June												
Glyp+2,4-D	3+12	July	99	100	95	97	100	96	88	100	96	100	100	97
Glyp+Dica	3+2	June												
Glyp+2,4-D	3+12	July	100	94	95	86	85	82	97	92	90	85	80	75
Glyp+Dica	1.5+2	June												
Glyp+2,4-D	3+12	July	100	85	85	72	90	80	95	82	87	80	75	70
Clsu	0.66	June	0	100	80	100	100	94	25	100	88	100	95	84

Summary

Broadleaf weed and foxtail control was excellent with all treatments. Glyphosate at 3 oz/A effectively controlled wild oat.

Cyanazine formulations for weed control in fallow, Fargo 1981-82. Treatments were applied October 20 to soil with 3000 bl/A of wheat stubble. The wettable powder(wp) formulation was applied with a bicycle wheel sprayer delivering 17gpa at 35psi and the granular formulation(SRG) applied with a cone applicator. Precipitation for a 2 week period following application totaled 0.22 inch. The back half of each plot was treated with glyphosate plus dicamba (3 + 2 oz/A) using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi on May 26. The experimental design was a randomized complete block with four replications and experimental units were 8 by 30 ft. Weed densities were moderate to heavy and were evaluated for control July 18.

Treatment	Rate lb/A	Percent Control							
						Glyp+Dica			
		Wioa	Wimu	Colq	Kocz	Wioa	Wimu	Colq	Kocz
Cyanazine-WP	2	0	73	93	95	99	100	100	100
Cyanazine-WP	3	0	71	91	96	100	100	100	100
Cyanazine-SRG	2	65	68	90	93	100	100	100	100
Cyanazine-SRG	3	58	80	95	96	100	100	100	100
Control		0	0	0	0	94	100	100	100
Mean		25	58	74	76	98	100	100	100
High mean		65	80	95	96	100	100	100	100
Low mean		0	0	0	0	94	100	100	100
Coeff. of variation		39	22	4	5	2	0	0	0
LSD(1 Percent)		20	28	7	7	5	0	0	0
LSD(5 Percent)		15	20	5	5	3	0	0	0
No. of reps		4	4	4	4	4	4	4	4

Summary

Wild oat control was better with the slow release granule than wettable powder formulation of cyanazine. Broadleaf weed control with cyanizine was not influenced by formulation. The application of glyphosate plus dicamba across the back half of the plot May 26 resulted in excellent weed control with all treatments.

Cyanazine formulations for weed control in fallow, Minot 1981-82. Treatments were applied October 26 to soil with 1500 lb/A of wheat stubble. The wettable powder (wp) formulation was applied with a bicycle wheel plot sprayer delivering 17 gpa at 35 psi and the granular formulation (SRG) applied with a cone applicator. Precipitation for a 2 week period following application totaled 0.07 inch. The back half of each plot was treated with glyphosate plus dicamba (3+2 oz/A) using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi on June 3. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 30 ft. Weed densities were moderate and were evaluated for control July 21.

		Percent Control									
							Glyp+Dica				
Treatment	Rate lb/A	Fxtl	Kocz	Ruth	Colq	Prpw	Fxtl	Kocz	Ruth	Colq	Prpw
Cyanazine-WP	2	30	98	70	91	56	41	100	99	100	100
Cyanazine-WP	3	70	100	79	94	68	88	100	100	100	96
Cyanazine-SRG	2	93	83	66	85	75	99	100	100	100	100
Cyanazine-SRG	3	90	85	81	85	69	95	100	99	100	100
Control		0	0	0	0	0	0	100	96	94	95
Mean		57	73	59	71	54	65	100	99	99	98
High mean		93	100	81	94	75	99	100	100	100	100
Low mean		0	0	0	0	0	0	100	96	94	95
Coeff. of variation		29	22	16	9	18	35	0	2	2	4
LSD(1 Percent)		36	34	21	14	21	49	0	5	5	8
LSD(5 Percent)		26	24	15	10	15	35	0	4	3	5
No. of reps		4	4	4	4	4	4	4	4	4	4

Summary

Foxtail control was better with the slow release granule than wettable powder formulation of cyanazine. Broadleaf weed control with cyanazine generally was not influenced by formulation. The application of glyphosate plus dicamba across the back half of the plot June 3 resulted in excellent broadleaf and foxtail control with all treatments except with the wettable powder formulation at 2 lb/A.

Cyanazine formulations for weed control in fallow, Williston 1981-82. Treatments were applied October 27 to soil with 3500 lb/A of wheat stubble. The wettable powder (wp) formulation was applied with a bicycle wheel plot sprayer delivering 17 gpa at 35 psi and the granular formulation (SRG) applied with a cone applicator. Precipitation for a 2 week period following application totaled 0.06 inch. The back half of each plot was treated with glyphosate (3 oz/A) using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi on June 4. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 30 ft. Weed densities were moderate and were evaluated for control July 15.

		Percent Control							
						Glyphosate			
Treatment	Rate lb/A	Fxtl	Ruth	Tamu	Vwht	Fxtl	Ruth	Tamu	Vwht
Cyanazine-WP	2	5	15	100	35	26	63	100	100
Cyanazine-WP	3	3	34	100	58	29	63	100	100
Cyanazine-SRG	3	96	50	80	100	97	58	99	100
Cyanazine-SRG	2	56	59	88	49	63	73	100	100
Control		0	0	0	0	33	41	100	99
Mean		32	23	74	48	49	59	100	100
High mean		96	59	100	100	97	73	100	100
Low mean		0	0	0	0	26	41	99	99
Coeff. of variation		41	56	30	25	23	26	1	1
LSD(1 Percent)		28	27	47	26	24	33	2	1
LSD(5 Percent)		20	19	34	19	17	23	2	1
No. of reps		4	4	4	4	4	4	4	4

Summary

Foxtail control was better with the slow release granule than wettable powder formulation of cyanazine. Broadleaf weed and volunteer wheat control with cyanazine formulations was variable. The application of glyphosate across the back half of the plots June 4 resulted in excellent volunteer wheat control with all treatments.

Postrmergence herbicide applications in fallow, Fargo 1982. Treatments were applied in standing wheat stubble May 26 to 1/2 to 4 inch weeds using a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi. Precipitation for a 2 week period following application totaled 1.2 inch. The experiment was a randomized complete block with 4 replications and experimental units were 10 by 20 ft. Weed densities were moderate to heavy and control was evaluated June 25 and July 18.

Treatment	Rate oz/A	Percent Control--June 25 evaluation					Percent Control--July 18 evaluation				
		WioaWimuWibwColqFxtl					WioaWimuWibwColqFxtl				
Paraquat+Chlorsulfuron+S	.5+0.015+.5%	88	100	100	100	100	61	100	100	100	100
Paraquat+Chlorsulfuron+S	0.5+.03+.5%	91	100	100	100	100	61	100	100	100	100
Paraquat+DPX-T6376+S	0.5+.015+.5%	88	100	100	100	100	66	100	100	100	95
Paraquat+DPX-T6376+S	0.5+.03+.5%	89	100	100	100	100	64	100	100	93	95
Paraquat+Napropamide+S	0.5+1+.5%	89	100	53	100	55	65	100	75	100	10
Paraquat+Napropamide+S	0.5+2+.5%	81	100	58	100	65	51	98	58	70	0
Paraquat+Napropamide+S	0.5+3+.5%	64	100	65	100	80	50	98	75	100	23
Paraquat+Cyanazine-W+S	0.5+2+.5%	98	100	100	100	99	89	100	100	100	63
Paraquat+Metribuzin-F+S	0.5+0.5+.5%	97	100	100	100	88	75	100	100	100	53
Glyp+Chlorsulfuron+S	.37+.03+.5%	99	100	100	100	98	95	100	100	100	96
Glyphosate+Chlorsulfuron+S	.5+.03+.5%	100	100	100	100	100	99	100	100	100	100
Glyphosate+R-40244+S	0.5+0.5+.5%	75	100	100	100	95	86	100	100	100	35
R-40244	0.5	23	100	100	100	0	0	100	100	100	20
R-40244	1.0	28	100	98	100	43	0	100	100	100	18
Chlorsulfuron+S	0.03+.5%	30	100	100	100	94	8	100	100	100	100
Terb+Chlorsulfuron+S	1.5+.015+.5%	94	100	100	100	100	86	100	100	100	98
Terbutryn+Chlorsulfuron+S	1.5+.03+.5%	95	100	100	100	100	83	100	100	100	100
Terbutryn+Metribuzin-F+S	1.5+0.5+.5%	96	100	100	100	100	80	100	100	100	83
Terbutryn+Cyanazine-W+S	1.5+2+.5%	95	100	100	100	100	76	100	100	100	74
Terbutryn+2,4-D	1.5+0.5+.5%	87	100	100	100	100	68	98	85	100	60
Terbutryn+Dicamba+S	1.5+0.25+.5%	92	100	100	100	93	61	100	100	100	58
SC-0224+R-40244	0.5+0.5	98	100	100	100	97	95	100	100	100	35
SC-0224+Chlorsulfuron	0.5+.015	100	100	100	100	100	99	100	100	100	100
SC-0224+Chlorsulfuron	0.5+.03	100	100	100	100	97	99	100	100	100	94
HOE-00661+Chlorsulfuron	0.5+.015	86	100	100	100	96	50	100	100	100	100
HOE-00661+Chlorsulfuron	0.5+.03	76	100	100	100	99	51	100	100	100	100
Control		0	0	0	0	0	0	0	0	0	0
Mean		80	96	92	96	85	64	96	92	95	67
High mean		100	100	100	100	100	99	100	100	100	100
Low mean		0	0	0	0	0	0	0	0	0	0
Coeff. of variation		18	0	12	0	8	24	2	18	11	25
LSD(1 Percent)		27	0	20	0	20	28	3	31	22	31
LSD(5 Percent)		21	0	15	0	15	21	2	24	17	23
No. of reps		4	4	4	3	2	4	4	4	3	4

Summary

Broad spectrum weed control was good to excellent with chlorsulfuron combinations with glyphosate, terbutryn and SC-0224. Wild oat control generally was not adequate with paraquat or HOE-00661.

Postemergence herbicide applications in fallow, Minot 1982. Treatments were applied in standing wheat stubble June 17 to 4 to 12 inch weeds using a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate and control was evaluated July 21.

Treatment	Rate lb/A	Percent Control				
		Fxtl	Ruth	Colq	Tamu	Wibw
Paraquat+Chlorsulfuron+S	.5+0.015+.5%	74	100	100	100	97
Paraquat+Chlorsulfuron+S	0.5+.03+.5%	93	100	100	100	100
Paraquat+DPX-T6376+S	0.5+.015+.5%	80	100	100	100	83
Paraquat+DPX-T6376+S	0.5+.03+.5%	95	100	100	100	98
Paraquat+Napropamide+S	0.5+1+.5%	49	83	90	100	33
Paraquat+Napropamide+S	0.5+2+.5%	97	89	98	100	43
Paraquat+Napropamide+S	0.5+3+.5%	99	93	98	100	63
Paraquat+Cyanazine-W+S	0.5+2+.5%	38	91	75	98	75
Paraquat+Metribuzin-F+S	0.5+0.5+.5%	75	99	100	100	90
Glyp+Chlorsulfuron+S	.37+.03+.5%	89	100	100	100	98
Glyphosate+Chlorsulfuron+S	.5+.03+.5%	84	100	100	100	100
Glyphosate+R-40244+S	0.5+0.5+.5%	76	93	100	100	95
R-40244	0.5	30	68	98	100	66
R-40244	1.0	64	76	100	100	84
Chlorsulfuron+S	0.03+.5%	43	100	100	100	100
Terb+Chlorsulfuron+S	1.5+.015+.5%	66	100	100	100	94
Terbutryn+Chlorsulfuron+S	1.5+.03+.5%	69	100	100	100	95
Terbutryn+Metribuzin-F+S	1.5+0.5+.5%	76	96	100	100	94
Terbutryn+Cyanazine-W+S	1.5+2+.5%	35	90	100	100	85
Terbutryn+2,4-D	1.5+0.5+.5%	20	84	95	100	43
Terbutryn+Dicamba+S	1.5+0.25+.5%	13	95	99	100	100
SC-0224+R-40244	0.5+0.5	84	92	100	100	96
SC-0224+Chlorsulfuron	0.5+.015	68	100	100	100	98
SC-0224+Chlorsulfuron	0.5+.03	78	100	100	100	100
HOE-00661+Chlorsulfuron	0.5+.015	74	98	100	100	96
HOE-00661+Chlorsulfuron	0.5+.03	84	100	100	100	99
Control		0	0	0	0	0
Mean		65	91	94	96	82
High mean		99	100	100	100	100
Low mean		0	0	0	0	0
Coeff. of variation		22	6	9	1	15
LSD(1 Percent)		26	9	16	2	23
LSD(5 Percent)		20	7	12	1	18
No. of reps		4	4	4	4	4

Summary

Broad spectrum weed control was good to excellent with chlorsulfuron combinations with paraquat, glyphosate, terbutryn, SC-0224, and HOE-00661; DPX-T6376 combinations with paraquat; R-40244 combinations with glyphosate and SC-0224; or metribuzin combinations with paraquat and terbutryn.

Postemergence herbicide applications in fallow, Williston 1982. Treatments were applied in standing wheat stubble June 16 to 1 to 10 inch weeds using a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate and control was evaluated July 21.

Treatment	Rate lb/A	Percent Control			
		Fxtl	Ruth	Tamu	Vwht
Paraquat+Chlorsulfuron+S	.5+0.015+.5%	98	98	99	74
Paraquat+Chlorsulfuron+S	0.5+.03+.5%	100	100	100	93
Paraquat+DPX-T6376+S	0.5+.015+.5%	97	100	100	74
Paraquat+DPX-T6376+S	0.5+.03+.5%	100	100	100	80
Paraquat+Napropamide+S	0.5+1+.5%	53	70	100	60
Paraquat+Napropamide+S	0.5+2+.5%	88	86	93	73
Paraquat+Napropamide+S	0.5+3+.5%	90	86	94	74
Paraquat+Cyanazine-W+S	0.5+2+.5%	91	88	100	87
Paraquat+Metribuzin-F+S	0.5+0.5+.5%	99	100	100	100
Glyp+Chlorsulfuron+S	.37+.03+.5%	100	100	100	100
Glyphosate+Chlorsulfuron+S	.5+.03+.5%	100	100	100	100
Glyphosate+R-40244+S	0.5+0.5+.5%	92	94	96	100
R-40244	0.5	23	90	100	5
R-40244	1.0	51	89	100	5
Chlorsulfuron+S	0.03+.5%	98	98	100	0
Terb+Chlorsulfuron+S	1.5+.015+.5%	91	90	100	33
Terbutryn+Chlorsulfuron+S	1.5+.03+.5%	97	95	100	30
Terbutryn+Metribuzin-F+S	1.5+0.5+.5%	91	100	99	78
Terbutryn+Cyanazine-W+S	1.5+2+.5%	44	80	84	0
Terbutryn+2,4-D	1.5+0.5+.5%	46	88	94	11
Terbutryn+Dicamba+S	1.5+0.25+.5%	48	91	84	0
SC-0224+R-40244	0.5+0.5	99	99	99	99
SC-0224+Chlorsulfuron	0.5+.015	100	100	100	100
SC-0224+Chlorsulfuron	0.5+.03	100	100	100	100
HOE-00661+Chlorsulfuron	0.5+.015	95	95	100	21
HOE-00661+Chlorsulfuron	0.5+.03	95	93	100	25
Control		0	0	0	0
Mean		81	90	94	56
High mean		100	100	100	100
Low mean		0	0	0	0
Coeff. of variation		23	11	5	23
LSD(1 Percent)		35	18	9	24
LSD(5 Percent)		27	13	7	18
No. of reps		4	4	4	4

Summary

Broad spectrum weed control was good to excellent with chlorsulfuron combinations with paraquat, glyphosate and SC-0224; DPX-T6376 combinations with paraquat; R-40244 combinations with glyphosate and SC-0224; or metribuzin combinations with paraquat and terbutryn.

Postemergence herbicide applications in fallow, Langdon 1982. Treatments were applied in standing wheat stubble June 11 to 2 to 6 inch weeds using a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate and control was evaluated July 2 and 27.

Treatment	Rate lb/A	Percent Control July 2 evaluation Wioa	Wibw	Kocz	Fxtl	July 27 evaluation Wioa	Wibw	Kocz	Fxtl
Paraquat+Chlorsulfuron+S	.5+0.015+.5%	92	100	100	100	76	98	100	94
Paraquat+Chlorsulfuron+S	0.5+.03+.5%	91	100	100	100	70	100	100	98
Paraquat+DPX-T6376+S	0.5+.015+.5%	95	100	100	100	85	91	100	90
Paraquat+DPX-T6376+S	0.5+.03+.5%	89	100	100	100	85	100	100	99
Paraquat+Napropamide+S	0.5+1+.5%	81	88	95	93	39	10	75	28
Paraquat+Napropamide+S	0.5+2+.5%	78	70	95	94	45	33	90	48
Paraquat+Napropamide+S	0.5+3+.5%	76	80	96	96	55	38	90	68
Paraquat+Cyanazine-W+S	0.5+2+.5%	94	100	100	100	75	93	98	90
Paraquat+Metribuzin-F+S	0.5+0.5+.5%	100	100	100	100	95	100	100	91
Glyp+Chlorsulfuron+S	.37+.03+.5%	99	100	100	100	84	100	100	98
Glyphosate+Chlorsulfuron+S	.5+.03+.5%	99	100	100	100	91	100	99	99
Glyphosate+R-40244+S	0.5+0.5+.5%	99	78	100	100	78	93	98	64
R-40244	0.5	0	83	94	48	0	78	90	23
R-40244	1.0	0	91	98	76	0	86	98	50
Chlorsulfuron+S	0.03+.5%	8	100	100	100	8	96	98	96
Terb+Chlorsulfuron+S	1.5+.015+.5%	63	100	100	100	38	100	98	98
Terbutryn+Chlorsulfuron+S	1.5+.03+.5%	66	100	100	100	46	100	100	98
Terbutryn+Metribuzin-F+S	1.5+0.5+.5%	86	100	100	100	66	95	98	93
Terbutryn+Cyanazine-W+S	1.5+2+.5%	76	98	99	100	55	91	93	80
Terbutryn+2,4-D	1.5+0.5+.5%	40	75	95	98	5	55	90	50
Terbutryn+Dicamba+S	1.5+0.25+.5%	55	100	93	90	18	88	88	50
SC-0224+R-40244	0.5+0.5	99	100	100	100	89	85	100	73
SC-0224+Chlorsulfuron	0.5+.015	100	100	100	100	95	100	98	98
SC-0224+Chlorsulfuron	0.5+.03	99	100	100	100	93	100	100	100
HOE-00661+Chlorsulfuron	0.5+.015	58	98	99	100	25	100	100	96
HOE-00661+Chlorsulfuron	0.5+.03	53	98	100	100	15	100	100	100
Control		0	0	0	0	0	0	0	0
Mean		70	91	95	92	53	83	92	77
High mean		100	100	100	100	95	100	100	100
Low mean		0	0	0	0	0	0	0	0
Coeff. of variation		13	12	3	10	24	14	6	12
LSD(1 Percent)		17	20	5	17	24	22	10	17
LSD(5 Percent)		13	15	4	13	18	16	8	13
No. of reps		4	4	4	4	4	4	4	4

Summary

Broad spectrum weed control was good to excellent with chlorsulfuron combinations with paraquat, glyphosate and SC-0224; DPX-T6376, metribuzin and cyanazine combinations with paraquat; or R-40244 combinations with SC-0224.

Split fallow treatments, Fargo 1982. Chlorsulfuron and atrazine were applied in standing wheat stubble May 25 when broadleaf weeds were 1 to 3 inches tall and PP-009 June 8 when wild oats were in the 3 to 5 leaf stage and foxtail was 1/2 to 1 inch tall. Treatments were applied with a bicycle wheel plot sprayer delivering 17 gpa at 35 psi except PP-009 was in 8.5 gpa. Precipitation for a 2 week period following application totaled 1.6 and 0.82 inch for chlorsulfuron-atrazine and PP-009 applications, respectively. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate to heavy and control was evaluated June 24 and July 18.

		Percent Control								
	Rate	-June24 evaluation-				---July 18 evaluation---				
Treatment	oz/A	Wioa	Wimu	Kocz	Wibw	Wioa	Wimu	Kocz	Wibw	Fxtl
Chlorsulfuron	0.5	0	100	98	75	0	100	95	100	98
Chlorsulfuron+PP-009+OC	0.5+1+.25G	96	100	98	75	86	100	95	100	100
Chlorsulfuron+PP-009+OC	0.5+2+.25G	97	100	98	75	98	100	94	100	99
Chlorsulfuron+PP-009+OC	0.5+4+.25G	100	100	90	75	100	100	89	100	100
Atrazine-W	8	0	100	78	73	0	100	63	100	45
Atrazine-W+PP-009+OC	8+1+.25G	100	100	85	75	100	100	68	98	88
Atrazine-W+PP-009+OC	8+2+.25G	99	100	91	75	99	100	85	100	79
Atrazine-W+PP-009+OC	8+4+.25G	100	100	95	75	100	100	78	100	89
PP-009+OC	4+.25G	99	0	0	0	100	0	0	0	81
Control		0	0	0	0	0	0	0	0	0
Mean		69	80	73	60	68	80	67	80	78
High mean		100	100	98	75	100	100	95	100	100
Low mean		0	0	0	0	0	0	0	0	0
Coeff. of variation		3	0	12	35	8	0	12	2	16
LSD(1 Percent)		5	0	17	41	11	0	16	3	24
LSD(5 Percent)		3	0	13	31	8	0	12	2	18
No. of reps		4	4	4	4	4	4	4	4	4

Summary

Chlorsulforon at 0.5 oz/A provided excellent broadleaf and foxtail control, atrazine at 8 oz/A fair broadleaf and poor foxtail control and PP-009 at 1 to 4 oz/A excellent wild oat and fair foxtail control. Weed control was excellent with split applications of chlorsulfuron and PP-009 and fair with split applications of atrazine and PP-009.

Split fallow treatments, Minot 1982. Chlorsulfuron and atrazine were applied in standing wheat stubble June 3 when broadleaf weeds were 1 to 4 inch tall and PP-009 June 17 when foxtail was 1 to 2 inch tall. Treatments were applied with a bicycle wheel plot sprayer delivering 17 gpa at 35 psi except PP-009 was in 8.5 gpa. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate and control was evaluated July 21.

Treatment	Rate oz/A	Percent Control				
		Fxtl	Ruth	Colq	Wibw	Tamu
Chlorsulfuron	0.5	95	100	100	100	100
Chlorsulfuron+PP-009+OC	0.5+1+.25G	98	100	100	100	100
Chlorsulfuron+PP-009+OC	0.5+2+.25G	97	100	100	100	100
Chlorsulfuron+PP-009+OC	0.5+4+.25G	100	100	100	100	100
Atrazine-W	8	0	76	80	68	88
Atrazine-W+PP-009+OC	8+1+.25G	90	86	95	79	90
Atrazine-W+PP-009+OC	8+2+.25G	94	80	93	68	93
Atrazine-W+PP-009+OC	8+4+.25G	91	75	95	78	93
PP-009+OC	4+.25G	95	0	0	0	0
Control		0	0	0	0	0
Mean		76	72	76	69	76
High mean		100	100	100	100	100
Low mean		0	0	0	0	0
Coeff. of variation		4	9	8	14	6
LSD(1 Percent)		6	13	11	19	8
LSD(5 Percent)		5	10	8	14	6
No. of reps		4	4	4	4	4

Summary

Chlorsulfuron at 0.5 oz/A provided excellent broadleaf and foxtail control, atrazine at 8 oz/A fair broadleaf and no foxtail control and PP-009 at 1 to 4 oz/A excellent foxtail control.

Split fallow treatments, Williston 1982. Chlorsulfuron and atrazine were applied in standing wheat stubble June 4 when broadleaf weeds were 1 to 4 inch tall and PP-009 June 16 when volunteer wheat was in the 5 to 6 leaf stage and foxtail 1 to 2 inch tall. Treatments were applied with a bicycle wheel plot sprayer delivering 17 gpa at 35 psi except PP-009 was in 8.5 gpa. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate and control was evaluated July 15.

Treatment	Rate oz/A	Percent Control				
		Fxtl	Ruth	Tamu	Kocz	Vwht
Chlorsulfuron	0.5	92	93	100	94	0
Chlorsulfuron+PP-009+OC	0.5+1+.25G	100	100	100	100	95
Chlorsulfuron+PP-009+OC	0.5+2+.25G	100	100	100	100	100
Chlorsulfuron+PP-009+OC	0.5+4+.25G	96	99	100	100	100
Atrazine-W	8	44	81	98	81	10
Atrazine-W+PP-009+OC	8+1+.25G	80	85	95	90	100
Atrazine-W+PP-009+OC	8+2+.25G	70	80	90	88	100
Atrazine-W+PP-009+OC	8+4+.25G	96	81	98	84	100
PP-009+OC	4+.25G	97	0	0	0	100
Control		0	0	0	0	0
Mean		77	72	78	74	70
High mean		100	100	100	100	100
Low mean		0	0	0	0	0
Coeff. of variation		14	10	5	7	10
LSD(1 Percent)		22	14	7	10	14
LSD(5 Percent)		16	10	6	8	10
No. of reps		4	4	4	4	4

Summary

Chlorsulfuron at 0.5 oz/A provided excellent broadleaf and foxtail control, atrazine at 8 oz/A fair broadleaf and poor foxtail control and PP-009 at 4 oz/A excellent foxtail and volunteer wheat control. Weed control was excellent with split applications of chlorsulfuron and PP-009 and fair to good with split applications of atrazine and PP-009.

Fall burndown treatments in wheat stubble, Fargo 1981. Treatments were applied September 9 to 1 to 4 inch weeds in combined wheat stubble using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.15 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate and were evaluated for control September 27.

Treatment	Rate lb/A	---Percent Control--- Kocz	Wioa
Glyphosate+X-77	0.18+0.5%	18	92
Glyphosate+X-77	0.37+0.5%	39	94
Glyphosate+Dicamba+X-77	0.18+0.12+0.5%	50	91
Glyphosate+Dicamba+X-77	0.37+0.12+0.5%	56	96
Paraquat+X-77	0.25+0.5%	100	82
Paraquat+X-77	0.5+0.5%	100	94
Paraquat+Dicamba+X-77	0.25+0.12+0.5%	100	92
Paraquat+Dicamba+X-77	0.5+0.12+0.5%	100	89
SAN-315	1.2	91	44
SAN-315+TritonXA	1.2+0.5%	99	46
SAN-315	1.6	95	55
SAN315+TritonXA	1.6+0.5%	100	68
HOE-00661	0.25	93	70
HOE-00661	0.5	100	93
HOE-00661	0.75	100	93
HOE-00661+X-77	0.25+0.5%	87	73
HOE-00661+Dicamba	0.25+0.12	96	79
Amitrol	1.0	46	76
Terbutryn+X-77	1.5+0.5%	100	93
Terbutryn+Dicamba+X-77	1.5+0.12+0.5%	100	94
Control		0	0
Mean		79	77
High mean		100	96
Low mean		0	0
Coeff. of variation		12	16
LSD(1 Percent)		18	23
LSD(5 Percent)		14	18
No. of reps		4	4

Summary

Kochia control was good with all treatments except glyphosate or amitrol and foxtail control good with all treatments except SAN-315, amitrol or HOE-00661 at 0.25lb/A.

Fall burndown treatments in wheat stubble, Fargo 1982. Treatments were applied August 24 to 2 to 4 inch weeds in combined wheat stubble using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.19 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 10 by 25 ft. Weed densities were light and were evaluated for control September 10.

Treatment	Rate lb/A	----Percent Control---- Grft	Kocz
SC-0224	0.12	93	71
SC-0224	0.25	98	90
SC-0224+Dicamba	0.25+0.12	100	94
SC-0224+Dicamba	0.25+0.25	98	98
SC-0224+R-40244	0.25+0.5	100	98
SC-0224	0.5	100	100
SC-0224	1.0	100	100
Glyphosate+S	0.12+0.5	86	68
Glyphosate+Dicamba+S	0.12+0.12+0.5%	94	85
Glyphosate+2,4-D+S	0.12+0.25+0.5%	94	90
Glyphosate+S	0.25+0.5	96	90
Glyphosate+Dicamba+S	0.25+0.12+0.5%	98	90
Glyphosate+2,4-D+S	0.25+0.25+0.5%	98	93
Glyphosate+S	0.5+0.5%	100	95
Paraquat+S	0.12+0.5%	95	83
Paraquat+S	0.25+0.5%	98	91
Paraquat+Dicamba+S	0.25+0.12+0.5%	100	99
Paraquat+Dicamba+S	0.25+0.25+0.5%	98	98
Paraquat+S	0.5+0.5%	100	100
Paraquat+Glyphosate+S	0.12+0.2+0.5%	99	90
Paraquat+Glyphosate+S	0.25+0.1+0.5%	100	100
HOE-00661	0.5	98	93
HOE-00661	1.0	100	100
HOE-00661+Dicamba	0.5+0.12	100	99
HOE-00661+2,4-D	0.5+0.25	100	99
Control		0	0
Mean		94	89
High mean		100	100
Low mean		0	0
Coeff. of variation		4	7
LSD(1 Percent)		7	11
LSD(5 Percent)		5	8
No. of reps		4	4

Summary

Green foxtail control was excellent with all treatments and kochia control good to excellent with all treatments except SC-0224 and glyphosate at 0.12 lb/A alone.

Non-selective herbicides in fallow, Casselton 1982. Treatments were applied June 14 to 6 to 14 inch volunteer sunflower and wild mustard using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.55 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 10 by 20 ft. Weed densities were heavy and were evaluated for control June 22.

Treatment	Rate lb/A	---Percent Control---- SF	Wimu
Glyphosate+S	0.12+.5%	86	86
Glyphosate+S	0.25+.5%	91	90
Glyphosate+S	0.37+.5%	97	93
Glyphosate+2,4-D+S	0.12+0.25+.5%	86	91
Glyphosate+2,4-D+S	0.25+0.25+.5%	96	95
Glyphosate+Dicamba+S	0.12+0.12+.5%	89	96
Glyphosate+Dicamba+S	0.18+0.12+.5%	89	84
Glyphosate+Dicamba+S	0.25+0.12+.5%	93	91
Glyphosate+Dicamba+S	0.25+0.25+.5%	96	93
Glyphosate+N+S	0.12+1G+.5%	90	91
Glyphosate+N+S	0.25+1G+.5%	91	87
Paraquat+S	0.12+.5%	95	91
Paraquat+S	0.25+.5%	99	95
Paraquat+S	0.5+.5%	100	99
Glyphosate+2,4-D+S	0.25+0.25+.5%	97	98
Paraquat+2,4-D+S	0.25+0.25+.5%	97	99
Paraquat+Dicamba+S	0.12+0.25+.5%	98	99
Paraquat+Dicamba+S	0.25+0.12+.5%	99	100
Paraquat+Glyphosate+S	0.12+0.2+.5%	96	96
Paraquat+Glyphosate+S	0.25+0.1+.5%	98	95
HOE-00661	0.12	95	92
HOE-00661	0.25	98	97
HOE-00661	0.5	99	100
HOE-00661	0.75	99	100
HOE-00661+2,4-D	0.25+0.25	99	100
HOE-00661+Dicamba	0.25+0.12	98	99
SC-0224+S	0.25+.5%	92	90
SC-0224	0.25	92	91
SC-0224	0.5	98	94
SC-0224	1.0	99	92
Control		0	0
Mean		92	91
High mean		100	100
Low mean		0	0
Coeff. of variation		4	6
LSD(1 Percent)		7	10
LSD(5 Percent)		5	8
No. of reps		4	4

Summary

Wild mustard and volunteer sunflower control was good to excellent with all treatments.

Non-selective herbicides in fallow, Minot 1982. Treatments were applied June 17 to 2 to 12 inch weeds using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. Precipitation for a 2 week period following application totaled 1.2 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 10 by 20 ft. Weed densities were moderate and were evaluated for control July 21.

	Rate	Percent Control			
	lb/A	Ruth	Colq	Wibw	Tamu
Glyphosate+S	0.12+.5%	90	96	10	93
Glyphosate+S	0.25+.5%	98	100	43	100
Glyphosate+S	0.37+.5%	99	100	53	100
Glyphosate+2,4-D+S	0.12+0.25+.5%	97	100	45	100
Glyphosate+2,4-D+S	0.25+0.25+.5%	98	100	70	100
Glyphosate+Dicamba+S	0.12+0.12+.5%	98	100	93	100
Glyphosate+Dicamba+S	0.18+0.12+.5%	98	100	94	100
Glyphosate+Dicamba+S	0.25+0.12+.5%	100	100	97	100
Glyphosate+Dicamba+S	0.25+0.25+.5%	100	100	99	100
Glyphosate+N+S	0.12+1G+.5%	95	99	15	89
Glyphosate+N+S	0.25+1G+.5%	97	100	68	98
Paraquat+S	0.12+.5%	86	75	0	96
Paraquat+S	0.25+.5%	96	96	13	95
Paraquat+S	0.5+.5%	100	98	40	94
Paraquat+2,4-D+S	0.12+0.5+.5%	96	96	13	100
Paraquat+2,4-D+S	0.25+0.25+.5%	100	100	23	98
Paraquat+Dicamba+S	0.12+0.25+.5%	100	100	95	98
Paraquat+Dicamba+S	0.25+0.12+.5%	100	100	90	100
Paraquat+Glyphosate+S	0.12+0.2+.5%	95	96	23	95
Paraquat+Glyphosate+S	0.25+0.1+.5%	100	98	25	100
HOE-00661	0.12	79	75	13	88
HOE-00661	0.25	89	80	34	93
HOE-00661	0.5	98	100	71	100
HOE-00661	0.75	94	95	73	100
HOE-00661+2,4-D	0.25+0.25	88	100	58	100
HOE-00661+Dicamba	0.25+0.12	98	96	93	98
SC-0224+S	0.25+.5%	99	100	49	98
SC-0224	0.25	99	100	70	100
SC-0224	0.5	100	100	89	100
SC-0224	1.0	100	100	99	100
Control		0	0	0	0
Mean		93	94	53	94
High mean		100	100	99	100
Low mean		0	0	0	0
Coeff. of variation		5	7	34	6
LSD(1 Percent)		8	13	34	10
LSD(5 Percent)		6	10	25	8
No. of reps		4	4	4	4

Summary

Russian thistle, common lambsquarters and tansy mustard control generally was good to excellent with all treatments. The only treatments which adequately controlled wild buckwheat were dicamba combinations with glyphosate, paraquat or HOE-00661 and SC-0224 alone at 0.5 to 1.0 lb/A

Wheat on fall applied fallow herbicides, Fargo 1980-82. Fallow herbicides were applied in wheat stubble October 21, 1980. Precipitation totaled 22.2 inch during the 18 month period between herbicide application and wheat seeding. Era wheat was seeded May 1, 1982 into untilled soil. Wheat injury and stand reduction were evaluated June 10 and plots harvested August 8. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 17 ft.

Treatment	Rate lb/A	Wheat Yield bu/A	1981 Total % Control	------Wheat------ %ir	%sr
Hexazinone	0.75	43.4	60	0	0
DPX 4189	0.06	58.4	97	0	0
DPX 4189	0.12	55.9	100	0	0
DPX 5648	0.015	44.0	100	11	29
DPX	0.03	30.8	99	25	70
Cyanazine	2.5	48.8	70	0	0
Atrazine	1.0	42.5	56	9	0
Metribuzin	1.0	47.2	87	0	0
EL 187	0.5	38.9	67	9	0
EL 187	0.6	44.9	73	3	0
EL 187	0.75	50.2	98	3	0
EL 8778	1.0	46.0	81	6	0
EL 8778	1.2	39.7	82	9	0
EL 8778	1.5	51.4	90	12	0
Hexa+Metr	0.5+0.5	50.5	91	3	0
Hexa+Metr	0.5+0.75	46.8	91	1	0
Hexa+DPX41	0.5+0.06	56.0	99	0	0
Hexa+DPX56	0.5+0.03	37.3	100	18	43
Hexa+Diuron	0.5+1.0	46.3	89	0	0
Buth+Metr	1.0+0.5	53.7	97	0	0
Cyan+Atra	2.5+0.5	43.3	77	0	0
Cy+At+Proph	2.5+.5+3	54.0	83	0	0
Terb+Atra	2+0.5	46.0	67	0	0
DPX41+Metr	0.06+0.5	56.6	99	0	0
EL 187+Atra	0.6+0.6	50.5	95	15	0
Control		34.2	0	0	0
Mean		46.8	83	5	5
High mean		58.4	100	25	70
Low mean		30.8	0	0	0
Coeff. of variation		16.1	13	97	50
LSD(1 Percent)		13.9	19	8	5
LSD(5 Percent)		10.6	14	6	4
No. of reps		4.0	4	4	4

Summary

DPX-5648 alone or in combination with hexazinone injured wheat 11 to 25% and reduced wheat stand 25 to 70% depending on rate when wheat was seeded 18 monhs after application. In addition wheat stand was reduced 12 to 15% with EL-187 combinations with atrazine at 0.6 plus 0.6 lb/A (EL 8778 1.2 lb/A). Highest wheat yield was obtained on plots treated with chlorsulfuron at 0.66 lb/A.

Wheat on fall applied fallow herbicides, Minot 1980-82. Fallow herbicides were applied in wheat stubble October 7, 1980. Precipitation totaled 20.3 inch during the 19 month period between herbicide application and wheat seeding. Coteau wheat was seeded May 3, 1982. Wheat injury and stand reduction were evaluated July 22. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft.

Treatment	Rate lb/A	1981 Total % Control	Wheat %sr	Wheat %ir
Hexazinone	0.75	64	3	0
DPX 4189	0.06	90	0	0
DPX 4189	0.12	96	1	0
DPX 5648	0.015	87	0	0
DPX	0.03	95	1	0
Cyanazine	2.5	65	0	0
Atrazine	1.0	57	0	0
Metribuzin	1.0	65	1	0
EL 187	0.5	57	6	0
EL 187	0.6	68	8	0
EL 187	0.75	84	8	0
EL 8778	1.0	65	5	0
EL 8778	1.2	76	6	0
EL 8778	1.5	79	14	0
Hexa+Metr	0.5+0.5	83	0	1
Hexa+Metr	0.5+0.75	98	3	0
Hexa+DPX41	0.5+0.06	95	5	0
Hexa+DPX56	0.5+0.03	95	4	3
Hexa+Diuron	0.5+1.0	74	5	1
Buth+Metr	1.0+0.5	95	4	0
Cyan+Atra	2.5+0.5	63	0	0
Cy+At+Proph	2.5+.5+3	61	1	0
Terb+Atra	2+0.5	50	0	0
DPX41+Metr	0.06+0.5	92	1	0
EL 187+Atra	0.6+0.6	81	10	0
Control		0	0	0
Mean		74	3	0
High mean		98	14	3
Low mean		0	0	0
Coeff. of variation		6	108	620
LSD(1 Percent)		9	7	2
LSD(5 Percent)		7	5	2
No. of reps		4	4	4

Summary

EL-187 alone or in combination with atrazine (EL 8778) were the only treatments which significantly reduced wheat stands compared to the control.

Wheat on fall applied fallow herbicides, Williston 1980-82. Fallow herbicides were applied on wheat stubble October 8, 1980. Precipitation totaled 20.1 inch during the 19 month period between herbicide application and wheat seeding. Len wheat was seeded May 21, 1982 into untilled soil. Wheat injury and stand reduction were evaluated July 15. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 17 ft.

		Wheat			
Treatment		Yield bu/A	% SR	% IR	1981 total % control
Hexazinone	0.75	16.0	5	0	92
DPX-4189	0.06	18.3	0	1	97
DPX-4189	0.12	22.9	0	0	97
DPX-5648	0.015	19.1	0	0	97
DPX-5648	0.03	26.4	0	0	100
Cyanazine	2.5	12.3	2	0	77
Atrazine	1.0	14.8	6	6	80
Metribuzin	1.0	16.4	0	0	80
EL-187	0.5	15.2	47	0	90
EL-187	0.6	10.1	71	0	94
EL-187	0.75	5.5	86	0	95
EL-187+Atra	0.6+0.6	7.6	85	0	95
EL-8778	1.0	15.6	37	0	89
EL-8778	1.2	19.8	59	0	92
EL-8778	1.5	5.2	80	4	97
Hexa+Metr	0.5+0.5	20.0	0	0	95
Hexa+Metr	0.5+0.75	26.1	0	0	98
Hexa+DPX41	0.5+0.06	32.1	0	0	99
Hexa+DPX56	0.5+0.03	33.2	5	0	99
Hexa+Diuron	0.5+1.0	29.5	2	2	99
Buth+Metr	1.0+0.5	23.3	5	0	80
Cyan+Atra	2.5+0.5	19.8	2	0	76
Cy+At+Proph	2.5+0.5+3	20.3	4	0	75
Terb+Atra	2+0.5	18.1	4	2	75
DPX41+Metr	0.06+0.5	17.7	0	0	97
Control		17.2	0	0	0
Mean		18.6			87
High mean		33.2	86	6	100
Low mean		5.2	0	0	0
Coeff. of var.		28.1	87	54	10
LSD (1 percent)		11.5	22	4	11
LSD (5 percent)		8.4	17	3	8
No. of reps		4	4	4	4

Summary

Wheat stand was reduced 37 to 86% by EL-187 alone or in combination with atrazine (EL-8778) when seeded 19 months after application. Highest wheat yields were obtained on plots treated with hexazinone in combination with chlorsulfuron, DPX-5648, or diuron.

Wheat on spring preemergence fallow herbicides, Fargo 1981-82. Fallow herbicides were applied in wheat stubble March 22, 1981. Precipitation totaled 20.4 inch during the 13 month period between herbicide application and wheat seeding. Era wheat was seeded May 1, 1982 into untilled soil. Wheat injury and stand reduction were evaluated June 10 and plots harvested August 8. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 17 feet.

		Wheat			1981
Treatment	Rate lb/A	Yield bu/A	%sr	%ir	Total % Control
Hexazinone	0.5	29.0	0	0	82
DPX-4189	0.03	38.1	0	0	93
DPX-4189	0.06	45.6	0	0	95
DPX-4189	0.12	46.2	0	0	99
DPX-5648	0.004	32.6	3	0	96
DPX-5648	0.008	30.8	0	5	99
DPX-5648	0.015	33.4	6	5	99
Cyanazine-W	2	27.7	3	0	78
Atrazine-W	0.75	33.9	0	0	73
Metribuzin-W	0.75	28.6	8	0	79
EL-187	0.4	31.1	5	0	60
EL-187	0.5	30.3	3	0	69
EL-187	0.6	30.9	0	0	93
EL-8778	0.8	30.8	3	0	77
EL-8778	1	32.4	9	0	89
EL-8778	1.2	32.3	14	0	93
MC10108	1	30.9	3	0	67
MC10108	1.5	30.3	3	0	61
MC10108	2	30.2	0	0	62
R-40244	0.5	31.5	0	0	45
R-40244	1	29.9	3	5	61
Hexa+Metr-W	0.5+0.5	32.9	3	0	97
Hexa+DPX-4189	0.5+0.06	42.7	0	0	98
Hexa+DPX-5648	0.5+0.015	36.9	3	8	97
Hexa+Diuron	0.5+1.0	31.2	1	0	78
Buthidazole+Metr-W	1.0+0.5	36.7	0	0	98
EL-187+Atra-W	0.5+0.5	32.2	9	3	77
Cyan-W+Atra-W	2+0.5	31.4	3	0	82
Terbutryn+Atra-W	1.5+0.5	33.0	0	0	79
DPX-4189+DPX-5648	0.06+0.008	45.8	3	4	100
DPX-4189+DPX-5648	0.06+0.015	34.7	9	26	99
DPX-4189+Metr-W	0.06+0.5	44.8	0	0	100
Oxyfluorfen	0.5	30.6	0	0	81
Hexa+Oxyfluorfen	0.5+0.5	24.8	8	0	90
Control		22.4	1	0	0
Mean		33.3	3	2	81
High mean		46.2	14	26	100
Low mean		22.4	0	0	0
Coeff. of variation		19.5	199	347	14
LSD(1 Percent)		12.0	10	10	21
LSD(5 Percent)		9.1	8	8	16
No. of reps		4.0	4	4	4

Summary

The EL-187 combination with atrazine (EL 8878 1.2 lb/A) at 0.6 plus 0.6 lb/A was the only treatment which reduced wheat stand over 10%. Chlorsulfuron plus DPX-5648 at the high rate injured wheat. Highest wheat yields were obtained on plots treated with chlorsulfuron at 0.06 and 0.12 lb/A.

Wheat on spring preemergence fallow herbicides, Minot 1981-82. Fallow herbicides were applied in wheat stubble April 7, 1981. Precipitation totaled 15.4 inch during the 13 month period between herbicide application and wheat seeding. Coteau wheat was seeded May 3, 1982. Wheat injury and stand reduction were evaluated July 22. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 18 ft.

Treatment	Rate lb/A	1981 Total % Control	-------Wheat------- %sr	%ir
Hexazinone	0.5	55	0	0
DPX-4189	0.03	79	0	0
DPX-4189	0.06	89	0	0
DPX-4189	0.12	92	1	0
DPX-5648	0.004	52	0	4
DPX-5648	0.008	72	0	0
DPX-5648	0.015	75	1	0
Cyanazine-W	2	54	0	0
Atrazine-W	0.75	38	3	0
Metribuzin-W	0.75	68	4	0
EL-187	0.4	53	5	0
EL-187	0.5	51	4	0
EL-187	0.6	47	5	0
EL-8778	0.8	49	1	0
EL-8778	1	53	9	1
EL-8778	1.2	63	10	1
MC10108	1	46	0	0
MC10108	1.5	69	0	0
MC10108	2	73	0	0
R-40244	0.5	32	0	1
R-40244	1	53	1	3
Hexa+Metr-W	0.5+0.5	67	1	0
Hexa+DPX-4189	0.5+0.06	92	1	0
Hexa+DPX-5648	0.5+0.015	83	1	1
Hexa+Diuron	0.5+1.0	52	3	0
Buthidazole+Metr-W	1.0+0.5	80	4	0
EL-187+Atra-W	0.5+0.5	54	6	0
Cyan-W+Atra-W	2+0.5	65	0	0
Terbutryn+Atra-W	1.5+0.5	38	1	0
DPX-4189+DPX-5648	0.06+0.008	94	0	0
DPX-4189+DPX-5648	0.06+0.015	93	0	0
DPX-4189+Metr-W	0.06+0.5	91	0	0
Oxyfluorfen	0.5	34	0	0
Hexa+Oxyfluorfen	0.5+0.5	41	0	0
Control		0	0	0
Mean		61	2	0
High mean		94	10	4
Low mean		0	0	0
Coeff. of variation		18	143	455
LSD(1 Percent)		21	5	3
LSD(5 Percent)		16	4	2
No. of reps		4	4	4

Summary

No chemical fallow treatment reduced wheat stand over 10% with a 13 month interval between application and seeding.

Wheat on spring preemergence fallow herbicides, Williston 1981-82. Fallow herbicides were applied in wheat stubble April 8, 1981. Precipitation totaled 16.9 inch during the 13 month period between herbicide application and wheat seeding. Coteau wheat was seeded May 3, 1982 into untilled soil. Wheat injury and stand reduction were evaluated July 15. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft.

Treatment	Rate lb/A	1981 Total % Control	-------Wheat------- %sr	%ir
Hexazinone	0.5	46	3	0
DPX-4189	0.03	85	0	0
DPX-4189	0.06	90	0	0
DPX-4189	0.12	99	0	3
DPX-5648	0.004	72	8	0
DPX-5648	0.008	73	3	3
DPX-5648	0.015	78	0	0
Cyanazine-W	2	59	0	0
Atrazine-W	0.75	48	0	3
Metribuzin-W	0.75	79	3	0
EL-187	0.4	48	38	0
EL-187	0.5	54	54	0
EL-187	0.6	70	86	0
EL-8778	0.8	62	41	0
EL-8778	1	71	79	0
EL-8778	1.2	80	89	0
MC10108	1	77	2	0
MC10108	1.5	86	4	5
MC10108	2	89	0	0
R-40244	0.5	60	1	0
R-40244	1	88	1	3
Hexa+Metr-W	0.5+0.5	95	4	0
Hexa+DPX-4189	0.5+0.06	93	6	0
Hexa+DPX-5648	0.5+0.015	84	1	0
Hexa+Diuron	0.5+1.0	84	10	0
Buthidazole+Metr-W	1.0+0.5	98	13	3
EL-187+Atra-W	0.5+0.5	83	85	1
Cyan-W+Atra-W	2+0.5	84	3	5
Terbutryn+Atra-W	1.5+0.5	71	0	0
DPX-4189+DPX-5648	0.06+0.008	97	0	0
DPX-4189+DPX-5648	0.06+0.015	99	0	0
DPX-4189+Metr-W	0.06+0.5	99	0	0
Oxyfluorfen	0.5	71	0	0
Hexa+Oxyfluorfen	0.5+0.5	90	10	0
Control		0	0	0
Mean		76	15	1
High mean		99	89	5
Low mean		0	0	0
Coeff. of variation		10	48	319
LSD(1 Percent)		14	14	4
LSD(5 Percent)		10	10	3
No. of reps		4	4	4

Summary

EL-187 alone or in combination with atrazine (EL 8778) reduced stand of wheat 38 to 89% depending on rate when wheat was seeded 13 months after application. In addition wheat stand was reduced 10 to 13% with hexazinone combinations with diuron and oxyfluorfen or buthidazole combinations with metribuzin.

Wheat on postemergence fallow herbicides, Williston 1981-82. Fallow herbicides were applied in wheat stubble May 20, 1981. Precipitation totaled 16.1 inch during the 11.5 month period between herbicide application and wheat seeding. Coteau wheat was seeded May 3, 1982 into untilled soil. Wheat injury and stand reduction were evaluated July 15. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft.

Treatment	Rate lb/A	1981 Total % Control	-------Wheat------- %sr	%ir
Paraquat+Cyanazine-W	0.5+2	98	1	0
Paraquat+Metribuzin-F	0.5+0.5	83	0	4
Paraquat+Atrazine-W	0.5+0.5	64	0	0
Paraquat+DPX-4189	0.5+0.03	98	0	1
Paraquat+DPX-4189	0.5+0.06	100	1	0
Paraquat+DPX-5648	0.5+0.004	96	0	3
Paraquat+DPX-5648	0.5+0.008	94	3	0
Terbutryn	2	69	3	4
Terbutryn+Cyanazine-W	1.5+1.5	95	0	3
Terbutryn+Dicamba	1.5+0.25	76	1	0
Terbutryn+Meto&Atra	1.5+.84	96	1	1
Terbutryn+Metribuzin-F	1.5+0.5	77	0	4
Terbutryn+Metolachlor	1.5+3	85	0	4
Terbutryn+Meto+Metr-F	1.5+3+0.5	97	4	5
Terbutryn+DPX-4189	1.5+0.03	98	0	0
Terbutryn+Hexazinone	1.5+0.5	99	11	0
R-40244	0.5	82	0	1
R-40244	1	87	0	0
MC10108	1	82	3	0
MC10108	1.5	91	1	2
MC10108	2	95	3	3
Control		0	0	0
Mean		85	1	2
High mean		100	11	5
Low mean		0	0	0
Coeff. of variation		7	225	184
LSD(1 Percent)		10	6	5
LSD(5 Percent)		8	4	4
No. of reps		4	4	4

Summary

Terbutryn in combination with hexazinone was the only treatment which significantly reduced stand of wheat 11.5 months after application. Slight crop injury was observed with several treatments.

Wheat on cyanazine fallow treatments, Minot 1981-82. Fallow herbicides were applied in wheat stubble May 6, 1981. Precipitation totaled 14.2 inch during the 12 month period between herbicide application and wheat seeding. Coteau wheat was seeded May 3, 1982. Wheat injury and stand reduction were evaluated July 22. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 18 ft.

Treatment	Rate lb/A	1981 Total % Control	-----Wheat------ %sr	%ir
Cyan-DF+Atrazine-W+2,4-D	2+0.4+0.5	84	0	0
Cyan-DF+Atrazine-W+2,4-D	3+0.6+0.5	94	1	0
Cyan-W+Atrazine-W+2,4-D	2+0.4+0.5	86	0	0
Cyan-W+Atrazine-W+2,4-D	3+0.6+0.5	93	1	0
Cyan-W+Atrazine-W+Glyphosate	2+0.4+0.37	81	0	0
Cyan-LF+Atra-W+Glyphosate	2+0.4+0.37	81	0	0
Cyan-W+Atrazine-W+Paraquat	2+0.4+0.5	80	0	0
Cyan-W+Atrazine-W+LOTM	2+0.4+0.25G	85	0	0
Control	0	0	0	0
Mean		76	0	0
High mean		94	1	0
Low mean		0	0	0
Coeff. of variation		4	433	0
LSD(1 Percent)		6	2	0
LSD(5 Percent)		5	2	0
No. of reps		4	4	4

Summary

No cyanazine-atrazine treatment reduced wheat stand with a 12 month interval between application and seeding.

Wheat on cyanazine fallow treatments, Williston 1981-82. Fallow herbicides were applied in wheat stubble May 6, 1981. Precipitation totaled 16.4 inch during the 12 month period between herbicide application and wheat seeding. Coteau wheat was seeded May 3, 1982 into untilled soil. Wheat injury and stand reduction were evaluated July 15. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft.

Treatment	Rate lb/A	1981 Total % Control	-----Wheat------ %sr	%ir
Cyan-DF+Atrazine-W+2,4-D	2+0.4+0.5	99	0	0
Cyan-DF+Atrazine-W+2,4-D	3+0.6+0.5	99	3	0
Cyan-W+Atrazine-W+2,4-D	2+0.4+0.5	98	0	0
Cyan-W+Atrazine-W+2,4-D	3+0.6+0.5	100	3	0
Cyan-W+Atrazine-W+Glyphosate	2+0.4+0.37	99	6	0
Cyan-LF+Atra-W+Glyphosate	2+0.4+0.37	97	0	0
Cyan-W+Atrazine-W+Paraquat	2+0.4+0.5	99	5	0
Cyan-W+Atrazine-W+LOTM	2+0.4+0.25G	98	3	0
Control	0	0	0	0
Mean		88	2	0
High mean		100	6	0
Low mean		0	0	0
Coeff. of variation		1	234	0
LSD(1 Percent)		2	10	0
LSD(5 Percent)		1	7	0
No. of reps		4	4	4

Summary

No cyanazine-atrazine treatment reduced wheat stand over 6% with a 12 month interval between application and seeding.

Conventional versus no-till production of seven crops, Fargo 1982. Trials were established in silty clay soil (experiment initiated 1976) to compare conventional (fall plowing, spring cultivating and harrowing) or no-till (seeding directly into standing stubble) production systems. Crop, variety, seeding date, plant stand and yield are presented in the table. Small grains and flax were seeded with a modified press drill and row crops with a flex planter. The experiment was a randomized complete block with a split plot arrangement and 4 replications. Experimental units were 15 by 40 ft.

			----Conventional----		------No-till-------	
Crop	Variety	Seeding date	Stand plants/3 ft	Yield units/A	Stand plants/3 ft	Yield units/A
Wheat	Era	5/4	99	42.8 bu	110	48.5 bu
Barley	Beacon	5/4	88	59.4 bu	84	66.7 bu
Flax	Culbert	5/4	162	10.8 bu	145	14.3 bu
Corn	Agsco 2XA1	6/1	5	64.8 bu	5	79.8 bu
Sunflowers	I-894	6/1	5	1158 lb	4	1178 lb
Soybeans	Evans	6/1	16	23.4 bu	17	20.0 bu
Sugarbeets	Bush Monofort	5/6	3	13.0 T	3	11.5 T

Summary

Wheat, barley, flax, and corn yields were higher; sunflower yields similar; and soybean or sugarbeet yields lower under no-till compared to conventional till systems in 1982. Moisture was a limiting factor during most of the 1982 growing season.

Conventional versus no-till production of wheat, Fargo 1982. Trials were established in silty clay soil (experiment initiated 1977) to compare conventional and no-till production of seven crops in 1981. Era wheat was seeded on this same plot area May 1, 1982. The entire experimental area was treated with diclofop plus bromoxynil when the wheat was in the 3-leaf stage. The experiment was a randomized complete block with a split plot arrangement and 4 replications. Experimental units were 15 by 40 ft.

	Wheat					
1981	Heads/3 ft row		Height (cm)		Yield, bu/A	
Crop	CT	NT	CT	NT	CT	NT
Wheat	123	100	68	68	39.3	42.3
Barley	123	104	70	70	45.6	46.6
Flax	137	138	71	71	47.1	47.9
Corn	136	130	68	68	42.8	42.5
Sunflowers	125	129	68	68	39.5	41.5
Soybeans	130	120	70	71	48.6	50.8
Sugarbeets	110	120	70	71	41.4	43.2
Mean	126	120	69	70	43.5	45.0
LSD 0.05 Till=NS			NS		NS	
Crop=11			NS		6.1	
Crop*Till=17			NS		NS	

	Weed counts/3 sq ft					
	Wioa		KOCZ		Grft	
	CT	NT	CT	NT	CT	NT
Wheat	5	6	1	2	25	30
Barley	3	4	2	3	19	30
Flax	6	4	1	2	37	46
Corn	1	1	7	6	30	40
Sunflowers	1	1	7	6	24	20
Soybeans	1	1	5	5	36	30
Sugarbeets	4	2	8	7	34	20
Mean	3	3	4	4	29	31
LSD 0.05 Till=NS			NS		NS	
Crop=4			4		NS	
Crop*till=NS			NS		NS	

Summary

Wheat stand counts and yield were similar in conventional or no-till treatments when averaged over previous crop. Wheat yields ranged from 39 to 49 bu/A under conventional till and 41 to 51 bu/A under no-till depending on previous crop. Wheat yields were highest under both systems when the previous crop was soybeans and lowest when the previous crop was wheat and sunflowers. Moisture was a limiting factor during much of the 1982 growing season.

Comparison of cyanazine formulations for weed control in no-till wheat, Fargo 1981-82. Treatments were applied in wheat stubble (3000 lb/A) November 18, 1981 and Era wheat seeded May 1, 1982 in 6 inch row spacings. Treatments were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 17 ft. Wheat injury ratings were on June 22.

		Wheat		
Treatment	Rate lb/A	Yield bu/A	%ir	%sr
Cyanazine(90DF)	2.5	26.9	0	8
Cyanazine(90DF)+PARA+D	3.8+.5+.5	26.7	8	4
Cyanazine(90DF)+D	2.5+.5	30.2	0	5
Cyanazine(90DF)+PARA	2.5+.5	31.5	0	5
Cyanazine(80W)	2.5	29.5	0	8
Cyanazine(80W)+PARA+D	3.8+.5+.5	34.2	0	4
Control		27.0	0	3
Mean		29.4	1	5
High mean		34.2	8	8
Low mean		26.7	0	3
Coeff. of variation		22.6	306	87
LSD(1 Percent)		13.5	7	9
LSD(5 Percent)		9.9	5	7
No. of reps		4.0	4	4

Summary

No treatment reduced wheat stand over 10%. Wheat yields were similar to the untreated control.

Fall herbicides for weed control in no-till wheat, Fargo 1981-82. Treatments were applied in wheat stubble (3000 lb/A) September 9, 1981 and Era wheat seeded May 1, 1982 in 6 inch row spacings. All treatments were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 17 ft. Weed control and crop injury ratings were on June 24.

Treatment	Rate oz/A	Wheat Yield bu/A	Wheat %ir	Wheat %sr	% Control Wimu
Chlorsulfuron	0.015	42.0	0	0	99
Chlorsulfuron	0.03	38.0	0	0	100
Cyanazine-W	2	34.9	0	0	80
Cyanazine-W	3	38.6	0	0	89
Pendimethalin	1	35.6	0	0	0
Pendimethalin	1.5	41.7	0	0	10
Oryzalin	1	36.9	0	0	0
Oryzalin	1.5	41.5	0	0	0
Terbutryn	2	32.3	0	0	68
Amitrol	1	33.1	0	0	23
Control		25.9	0	0	0
Mean		36.4	0	0	43
High mean		42.0	0	0	100
Low mean		25.9	0	0	0
Coeff. of variation		14.7	0	0	38
LSD(1 Percent)		10.4	0	0	31
LSD(5 Percent)		7.7	0	0	23
No. of reps		4.0	4	4	4

Summary

All herbicide treatments except terbutryn and amitrol resulted in a significant yield increase over the untreated control. Wild mustard stands were light and foxtail stands variable.

Influence of tillage and herbicides on weeds in wheat, Fargo 1982. The experiment was established in the fall of 1977 on a silty clay soil. Tillage and herbicides have been applied to the same area each year (except Chlorsulfuron was first applied in the fall of 1979). Chlorsulfuron (0.25 oz/A) was applied Sept. 30, 1981; Era wheat seeded and glyphosate (6 oz/A) applied May 1, 1982. Diclofop (12 oz/A) was applied to 2 to 3-leaf wheat and wild oat May 23 and 2,4-D (4 oz/A) to 4 to 6 inch broadleaf weeds June 10. The experiment was a randomized complete block with a split block arrangement and 4 replications. Experimental units were 15 by 25 ft.

	Wheat									
	Heads/3 ft row					Bu/A				
Tillage	None	Dicl	2,4-D	Di+d	Mean	None	Dicl	2,4-D	Di+D	Mean
NT-clsu	120	124	118	140	126	33.1	40.6	35.4	43.4	38.1
NT-glyp	49	83	28	112	68	7.8	26.9	8.4	37.3	20.1
Disc	52	60	40	93	61	8.4	15.8	10.5	30.7	16.4
Plow	28	73	32	123	64	11.5	26.8	12.6	36.7	21.9
Chisel plow	35	70	43	101	62	5.4	16.6	8.8	32.8	15.9
Mean	57	82	53	114		13.2	25.3	15.1	36.2	
LSD (0.05) Till=18								6		
Herb=13								5		
Herb*Till 25								9		

	Weed counts/3 sq ft									
	Fxtl					Wioa				
	None	Dicl	2,4-D	Di+d	Mean	None	Dicl	2,4-D	Di+D	Mean
NT-clsu	18	4	23	3	12	38	1	45	2	22
NT-glyp	30	5	31	10	19	102	4	121	4	58
Disc	59	10	52	15	34	88	2	141	4	59
Plow	48	9	61	12	34	124	12	137	10	71
Chisel plow	44	11	48	15	30	147	7	181	15	88
Mean	40	8	43	11		100	5	125	7	
LSD (0.05) Till= 7								14		
Herb= 9								18		
Till*Herb=20								40		

	Wimu					Cath				
NT-clsu	0	0	0	0	0	0	0	0	0	0
NT-glyp	6	13	0	0	5	5	7	1	1	3
Disc	34	50	0	1	21	2	1	0	0	1
Plow	18	38	0	0	14	0	0	0	0	0
Chisel plow	13	57	0	0	18	2	1	0	0	1
Mean	14	32	0	0		2	2	0	0	
LSD (0.05) Till= 5								2		
Herb= 7								2		
Till*Herb= 9								3		

Summary

Fall application of 0.25 oz/A chlorsulfuron effectively controlled all weed species in no-till plots except wild oat. Canada thistle populations were higher in reduced or no-till glyphosate plots than in plowed or chlorsulfuron treated plots especially without 2,4-D. Wheat yields were higher in no-till plots treated with chlorsulfuron than in any other tillage treatment regardless of postemergence herbicide. Moisture was a limiting factor during most of the 1982 growing season.

Weed control in no-till sunflowers, Fargo 1982. Hybrid 894 sunflowers were seeded in standing wheat stubble(3000 lb/A) and preemergence (PE) treatments applied May 26. Postemergence (P) treatments were applied to 1 to 5 inch weeds and 2 to 4 leaf sunflowers June 9. Herbicides were applied with a bicycle wheel plot sprayer delivering 17 gpa for preemergence and 8.5 gpa for postemergence treatments both at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units 10 by 20 ft. Weed densities were moderate to heavy and control evaluated July 12.

Treatment	Rate lb/A	-Sunfwr- %ir	-Sunfwr- %sr	-----Percent Control---- Wioa	Wimu	Kocz	Fxtl	Tveg	Snfr 3 ft
Paraquat+S PE	0.25+.5%	0	0	61	70	63	0	65	3
Para+Pendimethalin+S PE	0.25+1.5+.5%	3	0	76	90	78	78	74	4
Para+Oryzalin+S PE	0.25+1.5+.5%	3	0	68	78	66	49	63	3
Para+Metolachlor+S PE	0.25+0.25+.5%	6	0	80	79	55	74	76	3
Paraquat+Alachlor+S PE	0.25+2.5+.5%	3	0	81	83	83	74	75	4
Para+Chloramben PE	0.25+2+.5%	4	0	89	94	76	79	79	3
Paraquat+R-40244+S PE	0.25+0.5+.5%	0	3	89	98	99	86	90	4
Para+Pend+Clam+S PE	0.25+1.5+1.5+.5%	3	0	80	95	85	81	85	4
Para+Pend+R-40244+S PE	.25+1.5+.5+.5%	0	3	87	96	98	88	89	3
Para+Meto+Clam+S PE	0.25+2+1.5+.5%	0	0	54	81	85	63	68	4
Para+Meto+R-40244+S PE	0.25+2+.5+.5%	3	0	75	83	74	72	74	3
Paraquat+S+PP-009 PE+P	0.25+.5%+.25	5	0	99	86	83	97	88	3
Paraquat+S+PP-009 PE+P	0.25+.5%+.5	3	0	96	95	76	99	85	3
Para+S+BAS90+R402 PE+P	.25+.5%+.25+.5	36	5	90	100	100	100	100	3
Para+R402+S+BAS90 PE+P	.25+.5+.5%+.25	0	0	100	100	100	100	100	4
Control weedy		0	0	0	0	0	0	0	3
Control weedfree		0	0	100	100	100	100	100	4
Mean		4	1	78	84	78	73	77	3
High mean		36	5	100	100	100	100	100	4
Low mean		0	0	0	0	0	0	0	3
Coeff. of variation		203	360	13	14	15	14	8	28
LSD(1 Percent)		15	4	18	22	22	19	11	2
LSD(5 Percent)		11	3	14	16	16	14	8	1
No. of reps		4	4	4	4	4	4	4	4

Summary

R-40244 plus BAS-9052 postemergence was the only treatment which resulted in significant sunflower injury. Pre or postemergence herbicide treatments increased weed control compared to paraquat alone. However, application of a single pre or postemergence herbicide did not give adequate control of all weed species. Broad spectrum weed control was good to excellent with pendimethalin in combination with R-40244 or pre and postemergence applications of R-40244 with BAS-9052.

Weed control in no-till sunflowers, Minot 1982. Hybrid 894 sunflowers were seeded in standing wheat stubble (2000 lb/A) with a buffalo till planter May 28. Preemergence (PE) treatments were applied June 3 and postemergence (P) treatments June 17 to 1 to 4 inch weeds and 2 to 4 leaf sunflower. Herbicides were applied with a bicycle wheel plot sprayer delivering 17 gpa for preemergence and 8.5 gpa for postemergence treatments both at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units 10 by 20 feet. Weed densities were moderate to heavy and control evaluated July 21.

		--Sunflower--		------Percent Control------							
Treatment	Rate lb/A	Yield lb/A	%ir	%sr	Colq	Kocz	Ruth	Rrpw	Fxtl	Tamu	Wioa
Paraquat+S PE	0.25+.5%	903	0	0	58	53	53	48	43	83	50
Para+Pendimethalin+S PE	0.25+1.5+.5%	1087	0	0	84	90	66	88	82	65	40
Para+Oryzalin+S PE	0.25+1.5+.5%	990	0	0	77	70	59	83	88	88	75
Para+Metolachlor+S PE	0.25+0.25+.5%	997	0	0	71	68	65	74	68	95	58
Paraquat+Alachlor+S PE	0.25+2.5+.5%	644	4	0	74	69	85	88	90	95	100
Para+Chloramben PE	0.25+2+.5%	1108	0	0	80	76	68	86	86	89	75
Paraquat+R-40244+S PE	0.25+0.5+.5%	1310	0	0	100	96	89	94	66	100	100
Para+Pend+Clam+S PE	0.25+1.5+1.5+.5%	1654	0	0	84	84	79	90	90	75	90
Para+Pend+R-40244+S PE	.25+1.5+.5+.5%	1799	3	0	95	97	93	95	96	98	90
ara+Meto+Clam+S PE	0.25+2+1.5+.5%	1241	0	0	86	80	93	93	95	85	81
Para+Meto+R-40244+S PE	0.25+2+.5+.5%	1671	0	0	98	91	79	90	97	85	75
Paraquat+S+PP-009 PE+P	0.25+.5%+.25	760	0	0	55	69	54	74	91	85	100
Paraquat+S+PP-009 PE+P	0.25+.5%+.5	1933	5	0	65	73	47	71	93	94	100
Para+S+BAS90+R402 PE+P	.25+.5%+.25+.5	929	38	30	100	100	100	100	98	100	100
Para+R402+S+BAS90 PE+P	.25+.5+.5%+.25	1922	13	3	99	99	79	99	97	100	100
Control weedy		591	0	0	0	0	0	0	0	0	0
Control weedfree		1871	3	0	100	99	100	98	100	100	100
Mean		1259	4	2	78	77	71	80	81	84	78
High mean		1933	38	30	100	100	100	100	100	100	100
Low mean		591	0	0	0	0	0	0	0	0	0
Coeff. of variation		38	243	237	15	20	25	17	17	16	0
LSD(1 Percent)		895	17	9	21	29	34	25	26	39	0
LSD(5 Percent)		673	13	6	16	22	26	19	19	29	0
No. of reps		4	4	4	4	4	4	4	4	2	1

Summary

R-40244 plus BAS-9052 postemergence injured sunflower 38% and reduced sunflower stand 30%. Application of a single pre or postemergence herbicide did not give adequate control of all weed species. Braod spectrum weed control was good to excellent with pendimethalin or metolachlor in combination with R-40244 and chloramben or pre and postemergence applications of R-40244 with BAS-9052.

Weed control in no-till sunflowers, Langdon 1982. Hybrid 903 sunflowers were seeded in standing wheat stubble (3000 lb/A) and preemergence (PE) treatments applied June 11. Postemergence (P) treatments were applied to 1 to 3 inch weeds and 2 to 4-leaf sunflowers July 2. Herbicides were applied with a bicycle wheel plot sprayer delivering 17 gpa pre and 8.5 gpa post both at 35 psi. The experiment was a randomized complete block with 4 replications and experimental units 10 by 20 ft. Weed densities were moderate to heavy and control evaluated July 27.

Treatment	Rate lb/A	Sunf. %ir	Sunf. %St	Percent Control Kocz	Wioa	Grft	Colq	Wibw
Glyphosate+S PE	0.37+.5%	0	0	53	69	50	76	40
Glyp+Pendimethalin+S PE	0.37+1.5+.5%	0	0	80	69	94	98	73
Glyp+Oryzalin+S PE	0.37+1.5+.5%	0	0	70	66	89	95	69
Glyp+Metolachlor+S PE	0.37+0.25+.5%	0	0	61	69	69	94	48
Glyphosate+Alachlor+S PE	0.37+2.5+.5%	0	0	66	70	83	91	53
Glyp+Chloramben PE	0.37+2+.5%	0	3	78	84	94	100	94
Glyphosate+R-40244+S PE	0.37+0.5+.5%	0	0	90	76	66	98	79
Glyp+Pend+Clam+S PE	0.37+1.5+1.5+.5%	3	0	89	88	99	100	95
Glyp+Pend+R-40244+S PE	.37+1.5+.5+.5%	0	0	93	78	99	100	91
Glyp+Meto+Clam+S PE	0.37+2+1.5+.5%	3	0	90	79	96	100	97
Glyp+Meto+R-40244+S PE	0.37+2+.5+.5%	3	0	90	88	96	100	88
Glyphosate+S+PP-009 PE+P	0.37+.5%+.25	0	0	60	88	83	76	53
Glyphosate+S+PP-009 PE+P	0.37+.5%+.5	0	0	58	99	99	74	55
Glyp+S+BAS90+R402 PE+P	.37+.5%+.25+.5	65	0	98	76	94	100	88
Glyp+R402+S+BAS90 PE+P	.37+.5+.5%+.25	4	0	88	96	100	100	91
Control weedy		0	0	0	0	0	0	0
Control weedfree		0	0	100	94	96	100	100
Mean		4	0	74	76	83	88	71
High mean		65	3	100	99	100	100	100
Low mean		0	0	0	0	0	0	0
Coeff. of variation		90	825	14	12	15	8	13
LSD(1 Percent)		8	2	20	17	23	13	18
LSD(5 Percent)		6	2	15	13	18	10	14
No. of reps		4	4	4	4	4	4	4

Summary

R-40244 plus BAS-9052 postemergence was the only treatment which injured sunflowers. Broadspectrum weed control was good with pendimethalin or metolachlor in combination with chloramben and R-40244 or pre and postemergence applications of R-40244 with BAS-9052.

Recrop on spring 1981 chlorsulfuron treatments, Mohall 1982. Chlorsulfuron was applied June 12, 1981 with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. Glenn barley, Otana oats, Vic durum, Wichek flax, NK Px 111 corn and Stauffer 303 sunflowers were seeded June 2, 1982. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Crop injury ratings were on July 22, 1982.

Treatment	Rate oz/A	Percent Injury					
		Barl	Oats	Durm	Flax	Corn	Sunf
Chlorsulfuron+WK	0.25+.1%	0	0	0	57	82	95
Chlorsulfuron+LOTM	0.75+.1%	0	0	0	56	75	99
Chlorsulfuron	0.25	0	0	0	52	85	95
Chlorsulfuron+WK	0.5+.1%	29	0	0	85	98	100
Chlorsulfuron+WK	1+.1%	42	0	0	85	97	100
No. of reps		4	4	4	4	4	4
LSD (5 percent)		20	NS	NS	15	10	NS

Summary

Sunflowers, corn and flax were injured in 1982 by chlorsulfuron applied in 1981 at all rates and barley by chlorsulfuron at rates of 0.5 oz/A or higher. Chlorsulfuron at rates of 1 oz/A in 1981 did not injure oats or durum wheat in 1982.

Chlorsulfuron soil residual from 1979, Fargo NW-22 1982. The plot area received chlorsulfuron at 1 to 4 oz/A applied at 10 weekly intervals from June 4 to August 6, 1979. Soybeans were seeded to the area on May and sugarbeet on May 1982 and evaluated for stand reduction in July. The area was moldboard plowed in the fall of each year since the 1979 treatments. The 1979 experiment was a split plot wich chlorsulfuron rate as main-plots and week of application the sub-plots. Evaluations were over the main plots and the range represents the highest and lowest stand reduction for the sub plots in the main plot.

Chlorsulfuron (oz/A)	July 1980 % Stand reduction		August 1981 % Stand reduction		July 1982 % Stand reduction	
	Soybean	Sugarbeet	Soybean	Sugarbeet	Soybean	Sugarbeet
1	40-63	75-98	50-60	98-100	40-50	98-100
2	82-87	92-96	75-80	98-100	65-75	98-100
4	95-100	97-100	92-95	98-100	90-95	98-100

SUMMARY

Chlorsulfuron residual from 1 to 4 oz/A application in 1979 reduced sugarbeet stands 98 to 100 in 1982 regardless of the rate applied. Soybean stands were reduced similarily in 1982 as in 1980 and 81, except for a trend for less soybean stand reduction in 1982 from chlorsulfuron at 2 oz/A. Sub plots were only 6 feet wide, but interplot contamination was low as the untreated plots were easily distinguishable. The soil in the area has a pH of 8.2.