Eberlein

1981 NORTH DAKOTA WEED CONTROL RESEARCH

WEED SCIENCE

BIOLOGICAL CULTURAL CHEMICAL

NDSU

Weed Research Projects, Department of Agronomy
NORTH DAKOTA STATE UNIVERSITY
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Not for Publication

SUMMARY OF 1981

WEED CONTROL TRIALS

FIELD CROPS

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CLIMATIC DATA - CARRINGTON
1981

	Precipitation							Temperature													
								April		May		June		July		Aug.		Sept.		Oct.	
Date	April	May	June	July	Aug.	Sept.	Oct.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	1.18		.84			.05	.42	41	30	58	32	64	50	86	54	82	59	61	42	47	37
2			.04		.15			60	30	64	32	60	52	86	59	81	59	70	42	48	34
3				.46	.09			59	32	79	47	70	45	74	56	81	61	79	47	60	35
4							.04	39	26	65	40	75	45	79	56	77	61	63	40	60	45
5			.55		.15			49	23	62	38	74	54	85	60	80	61	70	40	55	44
6						.80		54	34	62	35	75	52	90	65	79	58	84	57	53	36
7						1.45		56	34	65	35	80	53	95	65	78	58	65	51	55	35
8			.03					54	27	64	36	75	55	97	64	82	57	71	51	61	39
9		T	.01				.04	55	27	56	25	70	50	76	51	75	49	81	53	65	47
10								65	30	46	26	70	50	86	51	74	55	86	55	63	37
11			.01	.15	.02			60	24	57	36	73	49	81	61	81	55	89	55	70	37
12				.15			T	40	24	61	44	75	48	79	63	88	54	75	54	67	50
13			1.90				.30	63	32	62	39	76	50	85	65	84	61	86	52	62	35
14				1.40				45	21	68	40	73	55	79	58	90	61	76	46	50	30
15			.07	.06		.01		52	21	69	42	61	46	66	59	79	53	61	44	52	30
16			.06		.01			72	39	76	44	61	46	81	60	74	50	60	37	62	31
17							.01	80	39	64	45.	75	49	79	60	76	52	55	35	68	40
18							.05	52	28	79	41	68	48	75	57	79	52	66	35	48	34
19			.05	.09			T	64	31	70	41	65	46	79	57	82	55	78	45	42	32
20			T	.07				49	20	76	47	66	45	82	60	88	62	70	43	66	36
21			.19	.11		.07	.12	60	20	81	49	72	48	81	58	95	62	67	43	45	25
22	.12		.08	3.23			T	69	38	82	51	68	51	76	58	90	65	68	43	35	23
23		.05		.06		.12	T	46	26	72	44	70	51	75	59	74	61	71	44	26	19
24		.23	.17			.45	T	56	26	46	41	66	50	82	61	75	61	61	46	32	19
25	.01	.48		.10	.01		.01	71	31	49	41	74	50	74	51	76	62	60	46	34	19
26		.03			.40	.25		71	41	54	45	75	51	66	51	75	55	63	46	36	19
27	.40		.01		.05			72	47	58	51	81	51	72	53	76	55	54	42	67	28
28	.02	.03	.28					52	44	66	51	89	62	74	51	76	52	55	39	42	27
29	.05		.05					61	41	78	52	72	52	72	51	75	50	48	34	64	38
30	.25					T	.04	55	39	70	41	72	52	80	54	82	53	55	35	62	38
31		.19		.11			.17			66	41			86	63	87	60			49	39

CLIMATIC DATA - CASSELTON
1981

Date	Precipitation							Temperature													
								April		May		June		July		Aug.		Sept.		Oct.	
	April	May	June	July	Aug.	Sept.	Oct.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1			.43			.21		64	33	72	43	73	56	82	63	85	62	71	42		
2					.10			66	38	83	41	58	55	82	65	87	66	69	48		
3			.11		.20			64	35	74	48	77	47	81	62	78	65	79	49		
4								64	22	63	37	75	54	83	56	83	59	66	38		
5			.39		.91			59	35	63	32	77	52	90	60	84	65	72	44		
6					T			63	32	73	38	80	48	93	67	74	58	80	56		
7		T				.68		60	35	69	41	78	55	94	71	83	59	83	50		
8					.33			60	38	68	26	69	51	80	56	80	58	74	46		
9			.03		T			68	32	58	23	71	49	85	49	74	55	80	52		
10			.06					64	22	63	42	73	45	92	62	81	47	89	51		
11								45	22	67	49	78	49	88	67	88	57	90	54		
12				.35				62	42	80	44	76	49	90	71	88	58	81	49		
13			.50					52	14	78	46	73	64	86	64	92	65	88	52		
14				1.43				61	23	83	49	65	52	72	63	85	59	78	40		
15			.22			.04		62	40	77	45	70	48	74	62	76	51	63	38		
16								84	49	74	53	78	46	83	63	75	52	61	35		
17				.23				60	26	76	37	71	57	80	62	76	49	60	31		
18								60	30	71	36	68	52	82	57	80	54	66	40		
19								61	20	85	55	59	47	81	67	84	57	79	40		
20				.01				59	35	83	47	72	51	83	62	86	63	73	42		
21						T		65	44	83	57	67	56	83	58	92	65	73	40		
22		.30	.29	.22	.28			49	40	83	57	71	49	73	58	73	66	71	47		
23		1.90	.29	.25		T		59	28	63	48	63	55	81	58	77	64	65	51		
24	1.02	.05		.05	1.15	.05		64	34	65	50	75	52	79	58	71	64	58	37		
25				.03		.04		74	34	59	52	77	51	69	49	74	60	68	42		
26	.29		T			.09		83	52	58	53	80	52	75	51	80	60	69	55		
27		.10	T			T		56	46	72	59	79	65	72	54	79	54	58	43		
28	.12		.39					64	47	80	59	79	64	74	48	75	49	55	30		
29	.10					T		64	40	69	49	75	52	79	58	78	62	52	38		
30						.02		62	33	63	36	80	57	83	64	83	61	58	42		
31		.40		.37						61	49			91	64	71	55				

CLIMATIC DATA - CROOKSTON
1981

	Precipitation							Temperature													
								April		May		June		July		Aug.		Sept.		Oct.	
Date	April	May	June	July	Aug.	Sept.	Oct.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.22		.93				.50	47	31	61	32	67	53	81	62	85	57	67	44	51	32
2		.01	.04					63	37	68	50	59	53	81	64	85	61	76	49	56	34
3				.03	.46			60	31	71	48	77	48	81	60	85	61	76	48	62	46
4			.37				.39	41	28	67	37	76	50	84	52	84	57	68	39	55	42
5			.18		.69		.37	50	22	64	32	74	54	89	61	84	62	76	49	53	42
6					.28	1.81	.05	61	32	66	31	75	53	92	63	76	61	76	64	56	33
7			.04		.12			58	32	67	32	65	58	91	70	83	57	72	51	59	31
8		.10	.01		.11			58	25	65	46	71	52	90	65	83	59	79	47	63	47
9		.01					.12	64	25	54	25	73	47	87	47	77	53	87	57	58	43
10			.01	.19				64	40	57	22	73	47	87	56	81	47	87	52	63	45
11				.94				60	17	65	41	77	53	82	63	89	56	87	56	67	51
12	.02			.05			.90	65	24	67	36	78	46	86	68	89	61	87	51	67	41
13			.65				.05	65	34	71	34	79	61	87	58	92	59	86	51	56	42
14			.14	.72				48	13	74	42	74	61	84	63	85	65	77	42	51	38
15			.08					72	26	77	49	73	49	71	61	81	50	66	45	57	36
16			.03					76	43	74	48	78	45	82	62	73	46	60	36	67	38
17			.03				.21	76	38	73	43	78	55	81	60	78	51	65	34	67	45
18			.01				.01	62	18	74	39	68	46	82	56	82	54	78	41	45	32
19								61	33	78	41	66	43	81	63	82	57	78	43	62	28
20								56	19	81	43	72	47	82	59	84	64	70	43	60	36
21			1.03		.17		.02	53	41	83	54	73	50	79	52	85	43	70	43	36	24
22			.01	.99				47	37	82	63	68	48	75	54	85	62	66	48	30	24
23		1.08	.19			1.07		49	34	71	53	69	51	75	54	78	63	62	48	29	18
24		1.01	.02	.08	.36		T	60	25	63	55	75	54	75	61	74	65	63	40	35	24
25	.09	.38	.03	T	.02		.02	63	38	59	49	75	52	74	46	76	63	67	49	30	20
26		T				.10		74	37	59	49	79	49	75	49	81	59	63	49	54	22
27	.58	T	.42					73	47	66	53	78	63	75	51	81	54	54	43	54	27
28	.05		.73			T		61	43	73	51	77	64	75	46	78	48	64	28	60	32
29	.11	.04						60	47	72	55	74	58	80	56	78	62	56	40	59	44
30	.19					.62	.09	61	41	67	37	78	51	80	62	85	61	56	42	55	48
31				.72	1.48					68	47			85	62	85	61			59	41

CLIMATIC DATA - FARGO
1981

Date	Precipitation							Temperature													
								April		May		June		July		Aug.		Sept.		Oct.	
	April	May	June	July	Aug.	Sept.	Oct.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	.02		.08		.02		T	52	33	63	51	73	56	82	63	85	62	69	44	49	34
2			.04	.57	T			66	41	81	51	58	55	82	65	87	66	79	51	58	31
3	T	T		.01	.08		.31	49	35	74	48	77	47	81	62	78	65	66	44	62	46
4			.12				.01	43	26	58	39	74	54	83	56	83	59	70	38	53	45
5					.07		.56	51	18	63	30	77	52	90	60	84	65	79	55	52	45
6			.04		.12	.52		64	34	66	30	80	48	93	67	74	58	82	58	56	34
7			T		T			58	30	66	40	78	55	94	71	83	59	73	49	60	33
8		T		T			.12	58	27	66	41	69	51	80	56	80	58	79	45	64	50
9	T	T	.10					68	27	49	28	71	49	85	49	74	55	89	56	56	46
10			.03	T				65	31	59	24	73	45	92	62	81	47	89	53	67	42
11						T	.12	45	20	64	43	78	49	88	67	88	57	78	55	69	51
12	.01		T	.13			.37	69	30	66	44	76	49	90	71	88	58	87	49	56	52
13	.02		.72	.01			T	53	24	71	33	76	64	86	64	92	65	79	48	56	39
14			.10	1.44		.03		51	12	74	43	65	52	72	63	85	59	62	43	52	32
15			.01	.02				71	33	77	45	70	48	74	62	76	51	60	39	60	32
16		.02	.01	T			.46	77	43	74	49	78	46	83	63	75	52	59	37	68	38
17		T	.10				.19	66	32	68	49	71	57	80	62	76	49	65	33	51	40
18			.01				T	62	23	71	36	58	52	82	57	80	54	78	39	40	29
19			.07	.06			T	52	32	76	41	59	47	81	67	84	57	73	41	64	33
20			T	.02	.23	T	T	55	19	81	43	72	51	83	62	86	63	73	43	50	28
21	T	T	.34				.16	55	42	84	54	67	56	83	58	92	65	72	42	31	25
22	T	1.63	.22	.13	T	T	.04	45	38	79	59	71	49	73	58	73	66	63	51	29	22
23		.54	.18	.06	.03	.03		53	31	59	53	63	55	81	58	77	64	58	48	30	15
24		1.16	.01	.04	.71	.03	.02	65	23	60	49	75	52	79	58	71	64	68	37	37	26
25	.06	T			.07	T	T	67	42	55	48	77	51	69	49	74	60	68	53	31	24
26		T	T			.03		74	41	58	52	80	52	75	51	80	60	63	52	60	27
27	.31	T	.04			T		60	47	66	51	79	65	72	54	79	54	55	34	42	29
28	.10	.05	.34			T	T	63	43	71	57	79	64	74	48	75	49	52	30	63	42
29	.08							59	47	69	49	75	52	79	58	78	62	60	38	61	47
30	.01			.71		.47	T	59	37	63	36	80	57	83	64	83	61	51	37	57	43
31		.06		.01	.43					61	49			91	64	71	55			60	35

CLIMATIC DATA - LANGDON
1981

	Precipitation							Temperature													
								April		May		June		July		Aug.		Sept.		Oct.	
Date	April	May	June	July	Aug.	Sept.	Oct.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1			.42			.07	.59	51	26	58	28	64	50	82	61	79	49	62	37	41	33
2		T		.20				58	35	74	46	60	52	80	63	81	57	67	41	49	34
3					.38			54	26	72	35	70	45	80	53	81	60	77	41	53	35
4			.42		.03		.18	40	21	62	30	75	45	84	60	76	59	61	36	52	42
5			.15					50	20	58	28	74	54	86	60	84	60	67	44	49	42
6			T		1.25	.22	.04	54	35	63	29	75	52	93	60	73	58	75	54	48	30
7					.03	.39		52	32	65	35	80	53	91	66	74	54	65	47	55	30
8		.36	.03		.01		.01	52	22	62	36	75	55	89	60	82	55	70	43	56	38
9			.25	.07				61	25	46	19	70	50	84	43	73	45	80	49	63	44
10				.20	.02			57	33	53	24	70	50	84	57	73	49	87	53	62	33
11								45	15	64	37	73	49	79	60	80	54	89	48	68	45
12							.44	59	19	65	39	75	48	82	60	89	55	75	48	66	47
13			.68				.33	56	26	69	39	76	50	85	61	79	58	81	46	47	35
14			.01	.19				47	11	72	38	73	55	79	60	91	55	72	39	45	31
15			.14	.10	T			72	33	67	41	61	46	73	59	--	47	65	38	48	31
16			.03	.07				80	35	65	34	61	46	76	50	--	42	58	41	57	33
17			.12	.03			.08	78	36	70	33	75	49	75	54	--	50	55	31	63	38
18			.02				.03	61	38	75	37	68	48	78	53	--	50	67	34	46	26
19			T					60	34	77	40	65	46	83	58	--	55	83	40	39	31
20				.04			T	57	26	81	33	66	45	80	56	--	--	68	39	59	30
21	T		.20		.11	.07	T	58	40	84	49	72	48	68	48	--	--	69	43	34	20
22	.03		.54				T	56	33	80	57	68	51	69	52	82	58	61	39	27	16
23		.55	.16		1.23	.03		51	28	74	40	70	51	82	56	72	60	63	44	26	12
24		.51	.21	.04	.16	.04	T	58	27	47	40	66	50	80	56	69	61	65	38	31	12
25	.16	.39			.07		T	66	36	51	42	74	50	68	40	75	61	62	40	31	10
26		.04			.08	.62		76	--	57	45	75	51	74	44	74	58	63	44	33	13
27	.36		T	.08		.12		67	43	66	44	81	51	75	42	77	51	51	37	55	24
28	.03						T	57	39	76	49	89	62	75	46	76	50	51	30	52	24
29	.03			.01			T	62	42	77	51	72	52	80	54	76	54	41	31	57	37
30	.14					.02	T	58	35	65	31	72	52	80	60	80	58	54	35	59	36
31				.10	.10		.13			72	40			78	50	86	58			49	34

CLIMATIC DATA - MINOT
1981

	Precipitation							Temperature													
								April		May		June		July		Aug.		Sept.		Oct.	
Date	April	May	June	July	Aug.	Sept.	Oct.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1			.96			T	.12	44	21	60	30	77	53	90	62	82	50	57	38	51	39
2			.47	.16	.28		T	68	27	67	32	55	47	91	59	87	53	74	43	51	38
3								59	26	80	43	81	45	80	54	85	59	81	39	63	38
4			.03				.08	54	21	69	38	78	46	87	60	87	58	66	40	50	43
5					.16	.01	.01	50	25	65	38	75	53	94	63	88	58	75	48	50	33
6					.18	.33	T	56	37	65	37	77	52	94	67	80	56	75	55	54	31
7			T		.01	.05		57	29	69	33	81	52	101	70	80	55	74	47	59	32
8		.06		.06	.02			53	23	64	43	73	50	101	57	88	55	79	50	66	42
9		T	.04					56	26	55	21	73	45	77	46	79	48	88	52	68	43
10			.06					62	30	50	25	68	46	91	51	78	55	93	55	65	36
11		.03	.04	.66			T	60	27	62	37	72	46	78	52	86	57	95	52	69	38
12	.03			.03			.06	43	28	67	37	74	46	77	62	94	60	84	54	68	49
13			.30				.16	62	22	61	39	78	54	87	63	87	60	90	47	61	37
14			.31	.16				45	15	70	39	69	50	81	58	95	57	79	45	46	28
15			.01	.04		.18	.03	55	19	72	40	66	48	71	54	83	53	65	37	49	32
16			.13	.11		T		77	41	72	40	58	47	79	53	72	50	65	30	62	36
17		T					.04	82	35	67	41	77	54	79	53	80	52	64	31	61	40
18			.15					58	30	73	41	62	45	79	55	83	58	71	42	51	34
19			.11	.22	.01			72	23	74	42	67	45	76	53	87	59	87	44	50	38
20			.01					53	22	77	44	64	45	84	55	89	60	77	41	65	32
21			.17	.15		.17		63	25	83	49	75	52	86	53	90	57	67	39	47	21
22			.17	.02	.04	.01	T	68	36	83	53	72	44	81	55	92	58	72	40	40	20
23		.19	.31	.06	.04			60	23	68	39	73	46	84	60	84	60	71	49	22	7
24		.31	.45	.01	.16		.04	66	28	42	36	75	51	86	59	69	55	72	38	35	7
25	T	.12		T			T	80	45	50	38	73	49	75	48	80	55	68	41	34	9
26		.05		T	.06	.65		71	41	53	48	77	49	67	45	79	54	61	45	42	15
27	.13	.01	T			.01		73	47	59	50	85	53	72	50	82	52	53	37	62	23
28	.44	.01						53	44	64	52	89	57	76	48	81	52	57	37	40	23
29	.19	.01	.12					60	40	81	49	72	47	79	48	82	54	56	35	61	27
30	.04	T		T		.01	.01	60	38	75	40	75	49	89	61	89	54	50	34	64	32
31		T			.26					72	48			88	53	94	51			48	33

VI

CLIMATIC DATA - WILLISTON
1981

Date	Precipitation April	Precipitation May	Precipitation June	Precipitation July	Precipitation Aug.	Precipitation Sept.	Precipitation Oct.	April Max.	April Min.	May Max.	May Min.	June Max.	June Min.	July Max.	July Min.	Aug. Max.	Aug. Min.	Sept. Max.	Sept. Min.	Oct. Max.	Oct. Min.
1			2.05					69	26	78	35	76	50	92	65	90	55	84	40	61	33
2	T		.56		.13			66	39	78	57	69	46	88	57	84	53	83	55	77	42
3								53	25	66	38	77	46	87	53	85	57	70	35	77	46
4	.07		.40				.10	51	23	65	36	76	55	96	58	86	57	80	40	51	36
5					.37		.03	58	28	70	43	74	51	96	58	86	59	92	56	56	30
6			.04			.04		56	33	70	43	75	50	103	65	83	52	81	53	64	28
7		.07						51	26	68	46	76	55	101	67	89	54	88	47	67	39
8		.10	.01		.12			54	25	55	40	72	54	90	53	88	57	90	52	65	45
9			.18				.10	62	27	55	23	69	45	91	44	80	53	93	57	62	36
10		.08	T					56	33	63	36	71	46	91	57	85	53	92	54	66	38
11	T							55	23	66	31	72	45	88	56	94	57	84	48	73	38
12	.10	.12	T				.44	59	34	64	42	72	49	89	67	94	60	91	53	71	42
13			.66					57	20	66	45	69	49	89	56	95	62	90	49	43	34
14				.22				59	19	70	40	68	42	89	61	94	58	80	53	48	26
15			.05	.09				77	32	71	53	67	45	81	54	85	57	73	41	62	29
16								77	38	68	41	77	45	80	53	84	57	69	36	66	36
17			.55				T	66	34	69	45	77	52	85	51	85	56	77	38	65	37
18			.08	.23				70	39	73	44	66	41	79	57	93	60	85	42	55	29
19			.06	.04				67	30	78	42	64	49	84	55	94	60	89	45	60	37
20						.11		75	28	86	50	71	46	87	52	89	65	88	53	59	34
21	T		.27		.03			73	44	86	51	72	48	93	59	88	60	74	38	42	21
22	.02	T		1.03	.15	.12	T	62	38	86	55	72	47	93	56	86	60	73	44	39	17
23		T	.63	.26	.03		T	74	38	62	42	72	53	89	57	82	53	69	47	36	8
24		.12	.26	.18	.02		.06	84	42	54	38	72	48	84	55	77	53	72	38	34	26
25						.06	T	79	47	68	49	76	48	72	53	80	53	68	42	38	13
26						.05		67	40	66	50	86	54	72	48	83	56	67	40	57	30
27	.14	.03	.05				T	65	47	65	54	86	63	77	52	82	53	57	32	51	30
28	.20	.02	.12					65	40	80	47	72	54	89	52	87	53	67	36	68	30
29		.07	.02			.06		65	39	76	47	75	45	89	51	92	55	67	41	66	36
30				.30	.10	.40		66	41	77	50	88	56	94	57	93	63	55	45	57	38
31										79	53			88	53	91	46			61	30

Soil Test Results at Various Weed Trial Locations

Location	Soil Texture	Organic Matter	pH	lb/A N	lb/A P	lb/A K
Section 22 Fargo	Silty Clay	6.5	7.5	Applied 70 lb/A N		
Main Station Fargo	Silty Clay	6.7	7.5	Applied 70 lb/A N		
Sugarbeet weed free	Silty Clay	5.8	6.6	256	22	475
Sugarbeet cultivation	Silty Clay	5.3	7.3	168	24	425
Casselton, ND	Silty Clay	4.0	7.9	Applied 70 lb/A N1/		
St. Thomas, ND	Loam	5.9	7.7	281	23	545
Clara City, MN	Clay Loam	7.6	7.6	224	53	300
Absaraka, ND	Loamy Sand	3.7	7.3	No fertilizer applied		
Langdon, ND	Clay Loam	4.6	7.8	Fertilized by test		
Minot, ND	Loam	2.7	7.0	Fertilized by test		
Williston, ND	Loam	2.3	6.8	Fertilized by test		
Carrington, ND	Loam	3.6	7.2	Fertilized by test		
Glyndon, MN	Silt Loam	3.7	7.8	175	20	270
Galchutt, ND	Loam	5.0	7.6	204	64	310
Thompson, ND	Silty Clay Loam	5.8	7.7	246	23	240

1/ Applied only to the flax, multispecies screening trial, and sugarbeet experimental areas.

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 the 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 the treated area and in 30 feet of row in each of the untreated areas on the sides of the treated area.

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
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
Wibw = 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
AM, LOAM = Concrete curing compound
HERB = Herbimax
TM, LOTM = Emulsifiable linseed oil
MOIS = Percent moisture
11E, PO = Sun superior spray oil
OC = Petroleum oil concentrate
Popl = Population
SPK = Spike stage
SURF, S = Surfactant
TWT = Test weight
WP = Wettable powder
WK = Surfactant by DuPont
X-77 = Surfactant by Ortho
Bivt = Bivert

LIST OF HERBICIDES TESTED IN 1981

Common Name or Code Name	Abbreviation[a]	Chemical Name	Trade Name
Acetochlor	Acet, MON 097	2-chloro-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 methyl sulfanilycarbamate	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-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	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 DPX-4189	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	Not released	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-dichloroallyl)diisopropylthio-carbamate	Avadex
Dicamba	Dica	3,6-dichloro-o-anisic acid	Banvel
Diclofop	Dicl	2-[4-(2,4-dichlorophenoxy)phenoxy] propanoic acid	Hoelon
Diethatyl	Diet	N-chloroacetyl-N-(2,6-diethylphenyl)-glycine ethyl ester	Antor
Difenzoquat	Dife	1,2-dimethyl-3,5-diphenyl-1H-pyrazolium	Avenge
Dinitramine	Dini	N^4,N^4-diethyl-α,α,α-trifluror-3,5-dini-trotoluene-2,4-diamine	Cobex
Difenopenten	KK80	4-[4-[4-(trifluoromethyl)phenoxy]phenoxy] -2-pentenoic	None

Common Name or Code Name	Abbreviation[a]	Chemical Name	Trade Name
Dinoseb	Dino, DNBP	2-sec-butyl-4,6-dinitrophenol	Dow General, Premerge
Diuron	Diur	3-(3,4-dichlorophenyl)-1,1-dimethylurea	Karmex
DPX-5648	None	2-Carbomethoxy-N-[(4,6-dimethylpyrimidin-2-yl)aminocarbonyl]benzenesulfonamide	Oust
EL 187, Isouron	None	Not released	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-propenyl)-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	Metaven
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
Linuron	Linu	3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea	Lorox
M 3785	None	2,4-D+3,6-dichloropicolinic acid	None
M 3972	None	3,6-dichloropicolinic acid	Lontrel
M 4505	None	Picloram	None
M 4506	None	Picloram	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
MCPA	None	[(4-chloro-o-tolyl)oxy]acetic acid	Numerous
Mefluidide	Mefl	N-[2,4-dimethyl-S-[[(trifluoromethyl) sulfonyl]amino]phenyl] acetamide	Embark, Vistar
Metham-sodium	Metham	sodium methyldithiocarbamate	Vapam
Metolachlor	Meto	2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl acetamide	Dual
Metribuzin	Metr	4-amino-6-tert-butyl-3-(methylthio)-as-triazine-5(4H)one	Sencor, Lexone
MO 70077	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
Nitrofluorfen	Nitr	2-chloro-1-(4-nitrophenoxy)-4-(trifluoromethyl) benzene	None
Oxyfluorfen	Oxyf	2 chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(tri-fluoromethyl)benzene	Goal
Oryzalin	Oryz	3,5-dinitro-N^4,N^4-dipropylsulfanilamide	Surflan
Paraquat	Para	1,1'-dimethyl-4,4'-bipyridinium ion	Paraquat

Common Name or Code Name	Abbreviation[a]	Chemical Name	Trade name
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
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
Profluralin	Prof	N-(cyclopropylmethyl)-α,α,α-trifluoro-2,6-dinitro-N-propyl-p-toluidine	Tolban
Prometryn	Prom	2,4-bis(isopropylamino)-6-(methylthio)-s-triazine	Caparol
Propachlor	Prcl	2-chloro-N-isopropylacetanilide	Bexton, Ramrod
Propanil	Prnl	3,4-dichloropropionalide	Stam,Stampe
Propazine	Prpz	2-chloro-4,6-bis(isopropylamino)-s-triazine	Milogard
Propham	Prph	isopropyl carbanilate	Chem Hoe-13
Pyrazon	Pyra	5-amino-4-chloro-2-phenyl-3(2H)-pyridazinone	Pyramin
R-25788	None	N,N-diallyl-2,2-dichloroacetamide	None
R-33865	Ext	Not released	None
R-40244	None	1-(m-trifluoromethylphenyl)-3-chlor-4-chloromethyl-2-pyrrolidine	None
RH-0265	None	Not released	None
RH-043-E	None	Not released	None
RH-9861	None	Not released	None
RO-13-8895	RO-13	acetone-o-[d-2-[p-[(α,α,α-trifluoro-p-tolyl) -oxy]phenoxy]propionyl]oxime	None
SAN 10315	None	Not released	None
SD 45328	None	alanine,N-benzoyl-N-(3-chloro-4-fluorophenyl-1-ethyl ester	Wildex
SD 49818	None	Not released	None
SD 92818	None	Not released	None
SD 95481	None	Not released	None
SD 96803	None	Not released	None
SN 80786	None	Not released	None
SSH 0860	None	Not released	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)diisopropylthio-carbamate	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, 1981. Era wheat, Park barley, Lyon oats, Bush Monofort sugarbeets, Culbert flax, OG-5201 pinto beans, Evans soybeans, upland navy beans, G-4224 corn, and Interstate 894 sunflowers were seeded May 12. Herbicides were applied June 10 when sugarbeets had 2 to 4 leaves, flax was 1 to 2 inches, corn was 5 to 6 inches, soybeans and edible beans were 2 to 3 inches, wild mustard was 2 inches, green foxtail had 2 to 3 leaves, sunflowers were 5 to 6 inches, and wheat, barley and oats had 2 to 3 leaves. A shower of rain fell 1.5 hours after treatment. Visual evaluations of weed control were taken July 7.

Treatment	Rate (lb/A)	Percent Control												
		Wht	Bar	Oats	Flax	Sugb	Fxtl	Wimu	Navy	Pinto	Soyb	Sunf	Corn	Colq
R-0265	.125	0	0	3	100	65	7	100	17	17	17	40	12	40
R-0265	.25	3	5	5	100	65	7	100	23	22	17	73	13	40
MO-70077	.625	7	7	7	100	77	57	93	50	52	7	75	33	50
MO-70077	1	7	7	8	100	70	50	97	50	52	20	80	35	35
MO-70077	1.25	7	8	8	93	83	40	92	75	83	15	88	62	30
MO-70077-0.78E	1	18	18	23	100	98	80	98	55	58	12	90	62	70
CGA-82725+OC	.2+.25G	32	99	100	0	0	100	0	0	0	0	0	100	0
CGA-82725+OC	.4+.25G	47	100	100	0	0	100	0	0	0	0	0	100	0
BAS 9052+OC	.2+.25G	100	100	100	0	0	100	0	0	0	0	0	100	0
BAS 9052+OC	.4+.25G	100	100	100	0	0	100	0	0	0	0	0	100	0
PP-009+OC	.2+.25G	100	100	100	0	0	100	0	0	0	0	0	100	0
PP-009+OC	.4+.25G	100	100	100	0	0	100	0	0	0	0	0	100	0
PP-009+Acif (Tackle) + OC	.2+.4+.25G	100	100	100	100	70	75	100	67	62	27	83	99	50
PP-009+Bent+OC	.2+1+.25G	100	98	100	50	100	57	100	7	0	0	85	100	70
PP-009+MCPA+OC	.2+1+.25G	100	98	99	10	100	60	100	50	40	80	97	66	99
Mefluidide+Surfactant	.12+.5%	97	95	98	53	60	82	55	27	18	22	62	92	0
Mefl+Acif (Blazer) + Surfactant	.12+.37+.5%	69	68	69	100	100	50	100	23	17	23	76	55	65
Mefl+S/Acif (Blazer) 3 day split*	.12+.5%+.25	97	95	97	96	73	60	100	48	45	45	82	73	25
Mefl+S/Acif (Blazer) 3 day split*	.12+.5%+.37	100	98	99	83	75	52	100	63	52	60	83	80	55
Acifluorfen (Blazer)	.37	30	25	43	100	62	22	100	0	0	7	58	13	25
Mefl+Desmedipham+Surfactant	.12+1+.5%	80	73	75	90	18	62	99	40	42	40	73	55	65
Mefl+Surf/Desm 3 day split*	.12+.5%+.25	95	92	92	66	20	67	99	47	47	50	67	85	63
Desmedipham	1	8	9	8	80	3	27	96	17	15	15	27	20	75
Mefl+Bentazon+Surfactant	.12+1+.5%	57	57	57	27	100	58	100	7	5	0	68	27	75
Mefl+Surf/Bentazon 3 day split*	.12+.5%+1	96	94	93	17	100	72	100	30	25	32	85	73	55
Bentazon	1	0	0	3	7	100	0	100	0	0	0	93	3	75
Dinoseb	1.5	5	10	8	37	97	7	100	5	2	3	53	0	95
Napt&NDBP (Dyanap)	3	7	43	42	3	100	7	100	18	15	10	73	15	75
Endothall+Dalapon+Surf	1.5+2+.5%	99	99	75	96	32	99	42	100	100	100	99	98	50
Mean		57	62	62	55	57	58	75	28	26	21	59	61	44
LSD (0.01)		23	31	33	42	47	31	19	39	40	29	34	51	74
LSD (0.05)		17	24	25	31	35	24	15	29	30	22	25	39	55
No. of Reps.		3	3	3	3	3	3	3	3	3	3	3	3	2

* Mefluidide + surfactant followed by acifluorfen 3 days later.

<u>Multispecies evaluation of preplant incorporated herbicides, Casselton, 1981</u>. Herbicides were applied and incorporated twice with a field cultivator plus harrow on May 12. Era wheat, Park barley, Lyon oats, Bush Monofort sugarbeets, Culbert flax, OG-5201 pinto beans, Evans soybeans, Upland navy beans, G-4224 corn, and Interstate 894 sunflowers were seeded May 12. Air temperature was 50°, soil was loose and dry, and wind was from the south at 10-20 mph during herbicide application. Visual evaluations were made on June 24.

	Rate	Percent Control											
Treatment	(lb/A)	Wht	Bar	Oats	Flax	Sugb	Fxtl	Wimu	Navy	Pinto	Soyb	Sunf	Corn
Trifluralin	1	27	0	82	10	95	98	0	0	0	0	0	38
SD-95481	0.5	0	0	25	0	0	87	15	0	0	10	3	10
SD-95481	1	35	28	85	3	0	92	57	2	0	17	20	75
SD-92818	0.5	3	0	0	0	0	63	0	0	0	0	13	15
SD-92818	1	10	10	28	0	0	84	10	0	0	0	13	77
SD-96803	0.5	0	0	25	0	0	65	2	0	0	0	0	7
SD-96803	1	3	3	75	0	0	90	30	3	3	0	0	42
Napropamide	2	27	5	10	10	0	75	27	0	2	10	15	3
Pronamid	2	27	27	72	88	40	60	58	0	0	0	5	60
S-734-F	1.5	0	0	0	0	0	93	3	0	0	7	77	37
SC-7829	3	15	7	22	0	0	96	33	3	0	0	37	23
Mean		13	7	38	10	12	82	21	1	0	4	16	35
LSD (0.01)		35	18	34	16	29	18	27	6	5	22	28	48
LSD (0.05)		26	13	25	12	21	13	20	3	3	16	20	36
No. of Reps.		3	3	3	3	3	3	3	3	3	3	3	3

<u>Multispecies evaluation of preemergence herbicides, Casselton, 1981</u>. Era wheat, Park barley, Lyon oats, Bush Monofort sugarbeets, Culbert flax, OG-5201 pinto beans, Evans soybeans, Upland navy beans, G-4224 corn, and Interstate 894 sunflowers were seeded and herbicides were applied May 12. Air temperature was 65°, sky was partly cloudy, soil was loose and dry, and wind was 10-20 mph from the southeast during herbicide application. Visual evaluations were made on June 24.

	Rate	Percent Control												
Treatment	(lb/A)	Wht	Bar	Oats	Flax	Sugb	Fxtl	Colq	Wimu	Navy	Pinto	Soyb	Sunf	Corn
Chloramben	3	10	8	15	0	76	60	90	47	0	0	0	0	60
RH-9861	1.5	77	67	62	73	89	24	0	12	17	10	0	17	15
RH-9861	3	98	95	73	98	93	68	70	27	37	28	35	10	27
SD-95481	0.75	2	0	27	10	10	67	0	0	8	0	0	0	25
SD-95481	1.5	0	3	43	20	43	70	0	0	7	0	0	2	50
SD-93818	0.75	0	7	2	0	0	41	0	0	0	0	10	28	17
SD-93818	1.5	0	0	7	0	0	70	0	0	0	0	0	0	7
SD-96803	0.75	0	0	13	0	0	43	0	0	0	0	0	7	13
SD-96803	1.5	7	7	64	0	0	57	0	0	0	0	0	0	33
MBR-22359	1.5	94	74	88	0	0	67	0	0	0	0	0	42	73
MBR-22359	3	99	95	98	0	5	86	0	20	0	0	10	68	99
MBR-23709	1.5	37	10	30	0	7	55	0	10	0	0	0	25	33
MBR-23709	3	47	33	53	0	13	67	70	28	0	3	10	48	7
Mean		36	31	44	15	26	60	18	11	5	3	5	19	35
LSD (0.01)		20	29	35	39	37	43	0	20	29	21	27	51	72
LSD (0.05)		15	21	26	29	28	32	0	15	21	16	20	38	53
No. of Reps.		3	3	3	3	3	3	1	3	3	3	3	3	3

Effect of number of cultivations and herbicide treatment on sugarbeet yield, Fargo 1981. Preplant incorporated herbicides were applied by operating a rototiller 4 inches deep and Great Western R1 sugarbeets were planted May 14 in a silty clay soil with 5.3% organic matter. Desmedipham was applied June 12 when sugarbeets had 2 to 6 leaves, desmedipham + BAS 9052 was applied June 18 when sugarbeets had 4 to 8 leaves, and desmedipham + ethofumesate was applied June 24 when sugarbeets had 6 to 10 leaves. Weed species present in the plot area were green foxtail, redroot pigweed, purslane, and kochia. Weed populations were variable. Sugarbeets were hand thinned but weeds were not removed in the thinning. Sugarbeets were harvested September 23.

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

Herbicide (When Applied)	Rate lb/A	Extractable Sucrose — Number of Cultivations 0	1	2	4	Herb. Mean
		-----	(lb/A)	-----		
Hand weeded check		4435	4990	5182	5710	5079
Cultivation alone		1716	3628	3337	3696	3094
Ethofumesate+cycloate (PPI)	3+4	3371	4958	4952	5746	4757
EPTC (PPI) 3, desmedipham (June 12)	1	3043	4950	4952	5155	4540
Desmedipham (June 12) 0.75, desmedipham+BAS 9052 (June 18) 0.75+0.2, desmedipham+ethofumesate (June 24) 0.75 +1.5		4258	4311	4638	4577	4446
Cultivation Mean		3365	4567	4624	4976	4383

LSD (0.05) Cultivation mean = 359, Herbicide mean = 402, Cult x Herb = 804

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

Herbicide (When Applied)	Rate lb/A	Sugarbeet Yield 0	1	2	4	Herb. Mean
		-----	(tons/A)	-----		
Hand weeded check		21.4	21.0	22.0	22.5	21.8
Cultivation alone		7.6	15.6	14.5	15.1	13.2
Ethofumesate+cycloate (PPI)	3+4	16.0	20.5	21.9	22.4	20.2
EPTC (PPI) 3, desmedipham (June 12)	1	13.8	19.4	20.1	20.9	18.6
Desmedipham (June 12) 0.75, desmedipham+BAS 9052 (June 18) 0.75+0.2, desmedipham+ethofumesate (June 24) 0.75+1.5		19.0	17.8	18.9	19.1	18.7
Cultivation Mean		15.6	18.9	19.5	20.0	18.5

LSD (0.05) Cultivation mean = 1.2, Herbicide mean = 1.4, Cult x Herb = 2.7

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

Herbicide (When Applied)	Rate lb/A	Sucrose Content 0	1	2	4	Herb. Mean
		(%)				
Hand weeded check		13.6	14.5	14.6	15.4	14.5
Cultivation alone		13.8	14.4	14.3	14.9	14.4
Ethofumesate+cycloate (PPI)	3+4	13.5	14.9	14.3	15.4	14.5
EPTC (PPI) 3, desmedipham (June 12)	1	14.0	15.3	15.1	15.0	14.9
Desmedipham (June 12) 0.75, desmedipham+BAS 9052 (June 18) 0.75+0.2, desmedipham+ethofumesate (June 24) 0.75+1.5		14.1	14.8	14.8	14.7	14.6
Cultivation Mean		13.8	14.8	14.6	15.1	14.6

LSD (0.05) Cultivation mean = 0.4, Herbicide mean = NS, Cult x Herb = NS

Increased numbers of cultivations tended to increase extractable sucrose/A and tons/A of sugarbeets. This differed from the results in 1980 when yields tended to be less from plots cultivated 3 or 4 times as compared to plots cultivated two times. The soil in 1980 was a loam with 3.4% organic matter and the soil in 1981 was a silty clay with 5.3%. Perhaps soil type affected the results. Weed populations were greater in 1980 than 1981. Weed control was good to excellent in herbicide treated or hand weeded plots which had been cultivated once or more. Hand weeded plots cultivated four times had more extractable sucrose/A than non-cultivated hand weeded plots. Plots cultivated once or more had a higher sucrose content than non-cultivated plots.

cides were applied and Bush Monofort sugarbeets were planted April 16. Cycloate+TCA and EPTC+cycloate were incorporated by cperating the rototiller 4 inches deep while the rototiller was set 2 inches deep for ethofumesate+TCA and diethatyl+TCA. TCA was applied preemergence April 18. A hard rain and hail on May 22 killed many emerged weeds and sugarbeets. Very few weeds were present in the plots until a second flush of weeds germinated after the rain. Desmedipham at 1 lb/A, the first half of split desmedipham at 0.75 lb/A, and lay-by propachlor granules at 6 lb/A were applied June 10 when the sugarbeets had 4 to 8 leaves, redroot pigweed was 1 to 3 inches, common lambsquarters was 2 to 5 inches, and nightflowering catchfly was 2 to 4 inches tall. The second half of split desmedipham at 0.75 lb/A and ethofumesate+desmedipham at 1.5+0.75 lb/A were applied June 17 when sugarbeets had 8 to 10 leaves, redroot pigweed was 2 to 6 inches, common lambsquarters was 4 to 10 inches, and nightflowering catchfly was 4 to 8 inches tall. Sugarbeets were harvested October 15.

Treatment	Rate (lb/a)	Sugb inj ratg	Rrpw cntl ratg	Colq cntl ratg	Fxtl cntl ratg	Nfcf cntl ratg
		----	----	(%)	----	----
Ethofumesate+TCA	4+6	0	65	30	69	45
Ethofumesate+TCA/Desmedipham	4+6+1	1	100	100	98	96
Etho+TCA/Desm/Prcl-Granules	4+6+1+6	0	100	100	97	100
Et+TCA/Desm/Prcl-G/Et+De	4+6+1+6+1.5+.75	6	100	100	100	100
Diethatyl+TCA	6+6	2	68	51	83	84
Diethatyl+TCA/Desmedipham	6+6+1	1	78	86	92	84
Diet+TCA/Desm/Propachlor-Gran.	6+6+1+6	0	96	89	98	94
Diet+TCA/De/Pr-G/Et+De	6+6+1+6+1.5+.75	5	100	100	100	95
Cycloate+TCA	3+6	3	46	20	65	31
Cycloate+TCA/Desmedipham	3+6+1	2	93	86	80	79
Cycloate+TCA/Desmedipham/Prcl-G	3+6+1+6	3	88	96	96	94
Cycl+TCA/De/Pr-G/Et+De	3+6+1+6+1.5+.75	6	100	100	98	98
Hand Weeded Check		0	100	100	100	100
EPTC+Cycloate	1+2.5	1	43	35	68	55
EPTC+Cycloate/Desmedipham	1+2.5+1	1	95	98	96	91
EPTC+Cycl/Desm/Propachlor-G	1+2.5+1+6	3	97	99	99	96
EP+Cycl/De/Pr-G/Et+De	1+2.5+1+6+1.5+.75	3	100	100	98	100
TCA	6	0	6	3	44	6
TCA/Desmedipham	6+1	0	76	65	44	20
TCA/Desmedipham/Propachlor-Gran.	6+1+6	1	85	91	76	49
TCA/Desm/Prcl-G/Etho+Desm	6+1+6+1.5+.75	2	100	100	100	90
TCA/Desmedipham/Desmedipham	6+.75+.75	0	95	94	93	39
TCA/Desm/Desm/Propachlor-G	6+.75+.75+6	1	87	83	93	81
Mean		2	83	79	86	75
High mean		6	100	100	100	100
Low mean		0	6	3	44	6
Coeff. of variation		176	19	25	22	21
LSD(1 Percent)		6	29	36	34	30
LSD(5 Percent)		4	22	27	26	23
No. of reps		4	4	4	4	4

Summary

Preplant incorporated ethofumesate+TCA followed by postemergence desmedipham gave nearly complete weed control and little additional benefit was noted from using lay-by propachlor or ethofumesate + desmedipham in addition to desmedipham. However, desmedipham, lay-by propachlor, and ethofumesate + desmedipham all contributed towards increased weed control when used over diethatyl+TCA, cycloate+TCA, EPTC+cycloate, or TCA.

(Experiment continued on next page)

Multiple herbicide treatments, Glyndon 1981. (continued)

Treatment	Rate (lb/a)	Sucrose (%)	Root Yield (ton/a)	Impurity Index	Extract Sucrose (lb/a)	Beet Popl #/60ft
Ethofumesate+TCA	4+6	13.1	19.5	1367	4030	63
Ethofumesate+TCA/Desmedipham	4+6+1	14.0	19.7	1343	4431	68
Etho+TCA/Desm/Prcl-Granules	4+6+1+6	14.0	19.7	1265	4494	64
Et+TCA/De/Prcl-G/Et+De	4+6+1+6+1.5+.75	13.3	19.3	1406	4034	65
Diethatyl+TCA	6+6	13.1	18.9	1435	3888	61
Diethatyl+TCA/Desmedipham	6+6+1	13.0	16.1	1398	3285	54
Diet+TCA/Desm/Propachlor-Gran.	6+6+1+6	13.8	19.0	1560	4008	53
Diet+TCA/De/Pr-G/Et+De	6+6+1+6+1.5+.75	13.7	17.4	1442	3759	41
Cycloate+TCA	3+6	13.2	15.2	1499	3053	48
Cycloate+TCA/Desmedipham	3+6+1	14.3	19.9	1271	4584	61
Cycloate+TCA/Desmedipham/Prcl-G	3+6+1+6	13.3	19.6	1497	4007	54
Cycl+TCA/De/Pr-G/Et+De	3+6+1+6+1.5+.75	13.1	16.8	1517	3382	45
Hand Weeded Check		13.1	22.0	1389	4569	62
EPTC+Cycloate	1+2.5	13.5	16.3	1452	3400	44
EPTC+Cycloate/Desmedipham	1+2.5+1	13.2	20.2	1325	4265	80
EPTC+Cycl/Desm/Propachlor-G	1+2.5+1+6	12.9	19.0	1346	3880	64
EP+Cycl/De/Pr-G/Et+De	1+2.5+1+6+1.5+.75	14.2	20.3	1219	4653	60
TCA	6	14.1	15.7	1338	3566	57
TCA/Desmedipham	6+1	13.7	12.3	1393	2665	36
TCA/Desmedipham/Propachlor-Gran.	6+1+6	13.0	16.8	1556	3395	38
TCA/Desm/Prcl-G/Etho+Desm	6+1+6+1.5+.75	13.7	20.9	1428	4490	66
TCA/Desmedipham/Desmedipham	6+.75+.75	13.7	20.9	1455	4463	55
TCA/Desm/Desm/Propachlor-G	6+.75+.75+6	13.4	18.6	1595	3780	41
Mean		13.5	18.4	1413	3917	56
High mean		14.3	22.0	1595	4653	80
Low mean		12.9	12.3	1219	2665	36
Coeff. of variation		6.6	16.9	13	19	29
LSD(1 Percent)		1.9	6.8	386	1604	35
LSD(5 Percent)		1.4	5.1	290	1206	26
No. of reps		3.0	3.0	3	3	3

Summary

The hail on May 22 caused erratic sugarbeet stands and thereby increased the variability in the yield data. Average sugarbeet populations varied from 36 to 80 plants per 60 feet of row. The hand weeded check had the greatest yield in tons/A and one of the highest levels of extractable sucrose but most of the treatments did not differ significantly from the hand weeded check.

Electrical discharge system and rope wick, Glyndon 1981. Bush Monofort sugarbeets were planted and TCA at 6 lb/A was applied over the entire plot area on April 16. A hard rain and hail on May 22 killed many emerged weeds and sugarbeets. Electrical discharge treatments were applied July 1, July 8, July 17, July 27, and August 5. Glyphosate was applied with a 'Lightning Rod' brand rope wick on July 6 and July 21. The rope wick was used in one direction (1X) or in two directions (2X). The electrical discharge system was deliberately set to contact the sugarbeet leaves in hand weeded plots on July 1, July 17, and August 5.

	Size of sugarbeets and weeds (inches)				
Date	Sugb	Rrpw	Colq	Sufl	Nfcf
July 1	12	18-22	24-30	14-18	8-16
July 8	18	18-26	24-36	20-36	14-20
July 17	24	28-30	30-36	30-42	20-24
July 27	26	36-40	36	42	24
Aug. 5	32	36-42	36	36-42	24

Sugarbeets were harvested October 15. The May 22 hail caused erratic sugarbeet stands and variability in the yield data was high because of the poor stands.

Treatment	Time of Application	Sucrose (%)	Root Yield (ton/a)	Impurity Index	Extract Sucrose (lb/a)	Beet Popl #/60ft
EDS Time 1		13.9	10.6	1452	2277	42
EDS Time 1+2		13.0	13.7	1526	2712	43
EDS Time 1+2+3		14.1	12.4	1500	2744	43
EDS Time 1+2+3+4		13.4	15.4	1606	3079	43
EDS Time 1+2+3+4+5		13.5	15.1	1393	3252	43
EDS Time 2		13.5	15.2	1478	3218	43
EDS Time 3		13.4	9.8	1474	2142	28
EDS Time 4		13.7	11.9	1354	2594	43
EDS Time 5		12.6	9.6	1614	1832	29

(Table continued on next page)

Table . Continued

Treatment	Time of Application	Sucrose (%)	Root Yield (ton/a)	Impurity Index	Extract Sucrose (lb/a)	Beet Popl #/60ft
Rope Wick 1X	Time 2	12.5	7.1	1476	1384	25
Rope Wick 2X	Time 2	13.3	8.2	1549	1733	23
Rope Wick 1X	Time 4	12.3	4.1	1741	745	19
Rope Wick 2X	Time 4	13.2	7.5	1438	1616	29
Rope Wick 1X	Time 2+4	13.1	7.2	1473	1473	21
Rope Wick 2X	Time 2+4	12.1	10.3	1610	1972	31
Hand Weeded Check		11.6	17.8	1858	2963	36
Weedy Check		12.7	9.5	1540	1884	38
Hand Weeded + EDS on Beets	Time 1	13.3	9.8	1652	1977	18
Hand Weeded + EDS on Beets	Time 3	12.1	15.0	1841	2780	29
Hand Weeded + EDS on Beets	Time 5	13.6	18.8	1305	4105	43
Mean		13.1	11.5	1544	2324	33
High mean		14.1	18.8	1858	4105	43
Low mean		11.6	4.1	1305	745	18
Coeff. of variation		5.8	33.4	14	36	36
LSD(1 Percent)		1.7	8.4	478	1856	27
LSD(5 Percent)		1.3	6.3	358	1387	20
No. of reps		3.0	3.0	3	3	3

Summary

Sugarbeet plots treated with glyphosate in a rope wick tended to yield the same as or less extractable sucrose/A than the weedy check even though weed control was generally good. Many sugarbeets showed typical glyphosate injury symptoms in the treated plots. Sugarbeet plots treated with the electrical discharge system tended to yield more extractable sucrose/A than the weedy check and several treatments yielded equal to or greater than the hand weeded check. Touching the sugarbeet leaves with the electrical discharge system on July 1 caused a reduction in sugarbeet population. Sugarbeets touched with the electrical discharge system on August 5 yielded over 1100 pounds of extractable sucrose more than the hand weeded check. This difference was not significant but the results suggest more work should be done.

Herbicides on hand weeded sugarbeets, Fargo 1981. Great Western R1 sugarbeets were planted May 13 and TCA at 6 lb/A was surface applied to the entire plot area May 14. The surface 2 inches of soil was dry and few sugarbeets germinated until after a 1.6 inch rain on May 22. Postemergence herbicides were applied June 22 when the sugarbeets had 6 to 8 leaves. Plots were hand weeded frequently throughout the growing season. Sugarbeets were harvested September 23.

Treatment	Rate (lb/a)	Sucrose (%)	Root Yield (ton/a)	Impurity Index	Extract Sucrose (lb/a)	Beet Popul #/40ft
Untreated Check		13.2	18.0	1576	3676	33
BAS 9052+OC	.25+.25G	12.6	21.3	1724	4001	34
BAS 9052+OC	.5+.25G	12.4	20.1	1797	3629	34
BAS 9052+OC	1+.25G	12.5	18.6	1755	3424	31
RO 13-8895+OC	.25+.25G	12.5	18.0	1809	3272	28
RO 13-8895+OC	.5+.25G	12.4	18.2	1876	3281	26
RO 13-8895+OC	1+.25G	12.6	18.5	1841	3329	29
PP-009+OC	.5+.25G	12.9	18.5	1711	3562	32
Mefluidide	.25	12.5	18.2	1709	3363	31
Acifluorfen (Tackle)	.25	12.6	14.7	1744	2785	20
Acifluorfen (Tackle)	.5	12.4	12.2	1810	2212	21
Acifluorfen (Tackle)	1	12.7	11.7	1732	2218	15
Acifluorfen (Blazer)	.25	12.3	13.4	1885	2341	25
Acifluorfen (Blazer)	.5	12.2	10.4	1910	1841	15
Acifluorfen (Blazer)	1	12.3	6.8	1836	1199	9
CGA-82725+OC	.25+.25G	12.1	19.7	1767	3529	33
CGA-82725+OC	.5+.25G	11.9	16.5	1948	2793	25
CGA-82725+OC	1+.25G	12.5	17.9	1829	3336	28
Diclofop	2	12.2	16.6	1954	2849	24
Diclofop	4	12.1	16.8	1957	2842	24
Desmedipham	2	12.3	18.3	1829	3277	30
Mean		12.4	16.4	1809	2989	26
High mean		13.2	21.3	1957	4001	34
Low mean		11.9	6.8	1576	1199	9
Coeff. of variation		5.2	21.9	10	26	33
LSD(1 Percent)		1.0	5.4	281	1160	13
LSD(5 Percent)		0.7	4.1	212	877	10
No. of reps		6.0	6.0	6	6	6

Summary

Acifluorfen reduced sugarbeet populations and yield of extractable sucrose per acre compared to the untreated check.

Fall and Spring Herbicides, Crookston, 1981. Fall herbicides were applied October 22,1980 and spring treatments on May 5, 1981. A rototiller incorporator was operated 4 inches deep for treatments containing EPTC or cycloate and 2 inches deep for others. 'Hilleshog 309' sugarbeets were seeded May 5 and soil moisture was adequate so seeds were placed in moist soil about 1.25 inches deep. Weed control and sugarbeet injury were evaluated June 8 and June 29.

			--June 8--		----June 29-----		
Treatment	Rate (lb/a)	Time of application	Sugb inj ratg	Grft cntl ratg	Grft cntl ratg	Prpw cntl ratg	Sugb inj ratg
			(%)				
EPTC+Diallate	4+1	Fall	3	91	84	63	5
Impregnated EPTC	4	Fall	6	80	50	3	0
EPTC	4	Fall	0	71	59	45	4
Cycloate	6	Fall	3	99	94	40	1
Impregnated Triallate	2	Fall	0	26	65	0	0
Triallate	2	Fall	0	28	56	3	0
Diallate	2	Fall	0	51	65	15	0
Impregnated EPTC	2.5	Spring	10	96	79	73	5
EPTC	2.5	Spring	8	95	82	41	9
Cycloate	4	Spring	0	99	94	71	3
Impregnated Triallate	2	Spring	0	33	70	55	1
Triallate	2	Spring	10	82	79	50	8
Diallate	2	Spring	2	69	85	0	1
EPTC+Diallate	2+1	Spring	15	90	88	60	9
EPTC 4 Fall + Diethatyl 4 Spring			22	98	92	92	10
EPTC 4 Fall + Ethofumesate 3 Spring			21	100	97	98	11
EPTC+Diallate 4+1 Fall + TCA 6 Spring			15	100	90	99	8
EPTC+Dial 4+1 Fall + Diethatyl 4 Spring			16	100	93	100	13
EPTC+Dial 4+1 Fall + Etho 3 Spring			25	100	98	75	11
Mean			8	79	80	52	5
High mean			25	100	98	100	13
Low mean			0	26	50	0	0
Coeff. of variation			96	15	11	16	126
LSD(1 Percent)			15	22	17	23	12
LSD(5 Percent)			11	17	13	17	9
No. of reps			4	4	4	2	4

Summary

EPTC impregnated on dry urea fertilizer gave control of green foxtail similar to liquid EPTC applied in water. Fall applied EPTC plus diallate gave weed control superior to fall applied EPTC. Diallate and triallate at 2 lb/A spring and fall applied gave from 56 to 79% control of green foxtail on June 29. Diethatyl and ethofumesate spring applied plus fall applied EPTC gave weed control superior to EPTC alone. Sugarbeets recovered from early herbicide injury as sugarbeet injury ratings were lower on June 29 than on June 8. Spring applied herbicides plus fall applied EPTC or EPTC plus diallate gave more sugarbeet injury than EPTC or EPTC plus diallate alone.

Weed beet control, Crookston 1981. Preplant incorporated herbicides were applied and rototiller incorporated by operating the rototiller 4 inches deep on May 5, 1981. The outer two rows of each plot were planted with commercial sugarbeet seed and the center two rows were planted with seed harvested from bolting sugarbeets in 1980. The commercial sugarbeet seed produced essentially zero bolters in 1981 while nearly all uncontrolled plants in the center two rows produced bolters. This suggests that most of the plants in the center two rows were from seed produced by annual bolters or weed beets and not by cold induced bolters. Early postemergence treatments were applied June 16 when the weed beets had 4 to 8 leaves. Late postemergence treatments were applied June 24 when the weed beets had 6 to 10 leaves. Weed beet control was evaluated visually June 29 and July 22. The presence or absence of bolted living plants was noted on July 22.

Treatment	Time of Application	Rate (lb/a)	June29 Webt cntl ratg	----July 22---- Webt cntl ratg	Bolters present
			-------(%)------		
Cyanazine-L	PPI	3	99	98	yes
Alachlor	PPI	3	72	46	yes
Pendimethalin	PPI	1.5	95	100	no
Trifluralin	PPI	.5	96	93	yes
Trifluralin	PPI	1	97	95	yes
Trifluralin+Chloramben	PPI	.75+2	97	95	no
Trifluralin+Metribuzin-F	PPI	.75+.25	99	100	no
2,4-D	June 16	.25	46	76	yes
2,4-D	June 24	.25	46	70	yes
2,4-D	June 24	.5	40	76	yes
2,4-D	June 16	.5	58	86	yes
MCPA	June 16	.25	45	49	yes
MCPA	June 16	.5	65	88	yes
MCPA	June 24	.5	44	79	yes
MCPA	June 24	.25	36	43	yes
Bromoxynil+MCPA	June 16	.25+.25	80	55	yes
Bromoxynil+MCPA	June 24	.25+.25	83	63	yes
Dicamba+MCPA	June 16	.12+.25	48	86	yes
Dicamba+MCPA	June 24	.12+.25	41	76	no
Picloram+MCPA	June 16	.016+.25	53	70	yes
Picloram+MCPA	June 24	.016+.25	44	75	yes

(Table continued on next page)

Table . Continued

Treatment	Time of Application	Rate (lb/a)	June29 Webt cntl ratg	----July 22---- Webt cntl ratg	Bolters present
			------(%)------		
Bentazon	June 16	1.5	99	93	yes
Bentazon	June 24	1.5	88	91	no
Chlorsulfuron	June 16	.01	98	100	no
Chlorsulfuron	June 24	.01	46	100	no
Napt+DNBP (Dyanap)	June 16	3+2	63	53	yes
Dinoseb	June 16	1.5	45	23	yes
Untreated Check 1			0	0	yes
Untreated Check 2			0	0	yes
Mean			63	72	
High mean			99	100	
Low mean			0	0	
Coeff. of variation			14	14	
LSD(1 Percent)			16	18	
LSD(5 Percent)			12	14	
No. of reps			4	4	

Summary

All preplant incorporated treatments except alachlor gave 93% or greater weed beet control. However, only pendimethalin, trifluralin+ chloramben, and trifluralin+metribuzin totally prevented bolting. MCPA at 0.25 lb/A gave poor weed beet control. 2,4-D at 0.25 or 0.5 lb/A and MCPA at 0.5 lb/A gave 70 to 88% control. Combining MCPA at 0.25 lb/A with bromoxynil or picloram gave only 55 to 75% control and none of these treatments prevented bolting. Dicamba + MCPA and bentazon applied at the 6 to 10 leaf stage prevented bolting. Chlorsulfuron at 0.01 lb/A gave 100% weed beet control and prevented bolting when applied at both growth stages.

EPTC and cycloate plus insecticides, St. Thomas 1981. Herbicides and herbicides plus insecticides were applied and incorporated by a rototiller set 4 inches deep May 6 and Beta 1443 sugarbeets were planted May 7. Liquid formulations of insecticides and herbicides were tank mixed and applied at 17 gal/A with a compressed air tractor sprayer. Soil temperature was 48 F at 3 inches. About 1 inch of rain fell May 8 and 4.05 inches of rain occurred from May 7 to June 9. Plots were evaluated visually on June 9 and June 25. Sugarbeets were harvested October 5.

		--June 9 Evaluation--				--June 25 Evaluation--			
		Colq cntl	Rrpw cntl	Grft cntl	Sgbt inj	Colq cntl	Rrpw cntl	Grft cntl	Sgbt inj
Treatment	Rate (lb/a)	ratg	ratg	ratg	ratg	ratg	ratg	ratg	ratg
		(%)							
EPTC+Dyfonate	2.5+2	93	94	99	24	85	77	100	13
EPTC+Dyfonate	2.5+4	88	90	96	19	83	68	100	10
Cycloate+Dyfonate	4+2	93	89	98	6	86	65	95	6
Cycloate+Dyfonate	4+4	91	90	98	8	86	65	98	1
EPTC+Lorsban	2.5+2	96	97	100	20	94	80	100	9
Cycloate+Lorsban	4+2	94	95	98	4	89	79	98	3
EPTC	2.5	98	93	100	21	93	75	99	8
Cycloate	4	95	94	100	6	93	85	97	3
Mean		93	93	98	13	88	74	98	6
High mean		98	97	100	24	94	85	100	13
Low mean		88	89	96	4	83	65	95	1
Coeff. of variation		5	4	3	56	8	15	2	44
LSD(1 Percent)		9	8	5	15	14	23	5	6
LSD(5 Percent)		7	6	4	11	10	17	3	4
No. of reps		4	4	4	4	4	4	4	4

Summary

Sugarbeet injury and weed control tended to be greater on June 9 than on June 25. EPTC+Dyfonate at 2.5+4 lb/A gave less control of common lambsquarters than EPTC at 2.5 lb/A. Cycloate+Dyfonate gave less redroot pigweed control than cycloate alone.

(Experiment continued on next page)

EPTC and cycloate plus insecticides, St. Thomas 1981. (continued)

Treatment	Rate (lb/a)	Sucrose (%)	Root Yield (ton/a)	Impurity Index	Extract Sucrose (lb/a)	Beet Popul #/70ft
EPTC+Dyfonate	2.5+2	14.0	21.5	1409	4741	72
EPTC+Dyfonate	2.5+4	13.2	25.4	1598	5072	69
Cycloate+Dyfonate	4+2	14.0	22.3	1464	4837	66
Cycloate+Dyfonate	4+4	13.9	23.8	1470	5180	72
EPTC+Lorsban	2.5+2	13.5	22.9	1523	4813	69
Cycloate+Lorsban	4+2	13.7	23.2	1452	4990	74
EPTC	2.5	13.7	25.0	1526	5280	70
Cycloate	4	13.7	21.6	1597	4510	72
Mean		13.7	23.2	1505	4928	70
High mean		14.0	25.4	1598	5280	74
Low mean		13.2	21.5	1409	4510	66
Coeff. of variation		3.4	9.1	7	8	8
LSD(1 Percent)		0.9	4.2	207	781	11
LSD(5 Percent)		0.7	3.1	152	574	8
No. of reps		4.0	4.0	4	4	4

Summary

Sugarbeets treated with EPTC or cycloate plus insecticides had extractable sucrose per acre and plant populations similar to EPTC or cycloate alone.

preplant incorporated herbicides, [illegible] 1987. Herbicides were applied and rototiller incorporated on April 27. Bush Monofort sugarbeets were seeded and preemergence TCA was applied April 28. The rototiller was operated 4 inches deep for treatments including EPTC or cycloate and 2 inches deep for the others. The soil surface 1 inch was dry at planting but sugarbeet emergence and common lambsquarters emergence was good. A frost on May 10 killed many of the sugarbeets. The first significant rain following planting was May 22 causing a second flush of common lambsquarters and a flush of redroot pigweed. Weed control was evaluated June 18.

Treatment	Rate (lb/a)	Sgbt % inj ratg	Early Flush Colq	----Late Flush---- Colq	Rrpw
			------ %	control rating	------
EPTC	2	8	11	0	0
EPTC	3	23	82	57	50
EPTC	5	58	93	74	63
Cycloate	3	0	64	25	25
Cycloate	4	0	53	30	30
Cycloate	6	0	83	75	75
EPTC+TCA	2+6	15	86	43	40
Cycloate+TCA	3+6	5	76	15	15
EPTC+Cycloate	1+2	3	63	23	18
EPTC+Cycloate	1+3	0	78	40	38
EPTC+Cycloate	1+4	8	89	50	46
EPTC+Cycloate	2+2	8	89	80	79
EPTC+Cycloate	2+3	8	88	78	69
EPTC+Cycloate	2+4	13	96	93	93
EPTC+Cycloate	3+2	5	90	85	83
EPTC+Cycloate	3+3	24	97	93	87
EPTC+Cycloate	3+4	28	94	93	93
TCA (Preemerge)	7	0	0	0	0
TCA (PPI)	7	0	10	0	0
Etho-F+TCA	4+6	0	83	84	89
Diethatyl+TCA	6+6	0	46	35	88
Ethofumesate-F	4	3	83	81	99
Diethatyl	6	3	31	30	88
Pyrazon-L+TCA	7+6	0	83	93	92
Etho-F+Cycloate	3+3	0	93	91	97
Diethatyl+Cycloate	4+3	3	74	62	95
Etho-F+Pyrazon-L	3+4	0	71	85	88
Diethatyl+Pyrazon-L	4+4	0	40	94	95
Etho-F+Cycloate	2+2	3	83	83	91
Diethatyl+Cycloate	3+2	8	65	53	76
Diethatyl+Ethofumesate-F	3+3	15	88	80	98
Mean		8	70	59	64
High mean		58	97	94	99
Low mean		0	0	0	0
Coeff. of variation		85	20	27	20
LSD(1 Percent)		12	26	29	23
LSD(5 Percent)		9	19	22	18
No. of reps		4	4	4	4

Summary

Cycloate did not injure sugarbeets even at 6 lb/A. EPTC plus cycloate with EPTC rates of 1 or 2 lb/A gave less sugarbeet injury than EPTC at 3 lb/A. EPTC+cycloate at 2+2, 2+3, or 2+4 lb/A gave less sugarbeet injury and better late flush weed control than EPTC at 3 lb/A. Treatments that included pyrazon tended to give better control of the late flush of common lambsquarters after the rain as compared to the early flush before the rain.

Control of Wild Proso Millet and Green Foxtail with Preplant Incorporated Herbicides, Clara City, 1981. TCA, EPTC, and cycloate were applied April 20 just before a one inch rain. The remainder of the treatments were applied and 'Bush Monofort' sugarbeets were seeded April 25. The rototiller incorporator was set 4 inches deep for treatments containing EPTC or cycloate and 2 inches deep for the others. Weed control and sugarbeet injury were evaluated June 3 and June 23.

		-------June23-------			---June 3---	
		Sugb inj ratg	Grft cntl ratg	Wipm cntl ratg	Sugb cntl ratg	Grft cntl ratg
Treatment	Rate (lb/a)	-----------------	-----------------	(%)	-----------------	-----------------
TCA	7	0	95	58	0	87
Ethofumesate+TCA	4+6	0	97	67	0	95
Diethatyl+TCA	6+6	0	98	86	0	98
EPTC	3	0	93	78	0	97
Cycloate	4	0	96	59	0	93
EPTC+TCA	3+6	3	99	95	0	100
Cycloate+TCA	4+6	0	100	82	0	100
Ethofumesate+Cycloate	3+3	0	100	95	0	100
Diethatyl+Cycloate	4+3	0	98	79	0	98
Diethatyl+EPTC	4+2	0	96	85	0	96
S-734	1.5	0	96	74	0	95
Etho+S-734	4+1.5	0	99	79	0	99
Diet+S-734	6+1.5	0	98	77	0	97
S-734	1	0	97	40	0	89
Mean		0	97	75	0	96
High mean		3	100	95	0	100
Low mean		0	93	40	0	87
Coeff. of variation		748	4	20	0	6
LSD(1 Percent)		3	7	28	0	10
LSD(5 Percent)		2	5	21	0	8
No. of reps		4	4	4	4	4

Summary

None of the treatments caused important sugarbeet injury. TCA, ethofumesate + TCA, cycloate, and S-734 at 1 and 1.5 lb/A gave less control of wild proso millet than EPTC + TCA and ethofumesate + cycloate, the top two treatments. S-734 at 1 lb/A gave less control of wild proso millet than S-734 at 1.5 lb/A. Green foxtail control was better on June 23 than on June 3. Ethofumesate + TCA and diethatyl + TCA gave grass control similar to ethofumesate + S-734 and diethatyl + S-734.

Soil applied herbicides, Thompson 1981. Preplant incorporated herbicides were applied and rototiller incorporated, Hilleshog 309 sugarbeets were planted, and preemergence herbicides were applied May 9, 1981. Sugarbeet injury and weed control were evaluated visually June 25. The redroot pigweed emerged about 1 week prior to evaluation so the control rating reflects herbicide performance 40 days after application.

Treatment	Incorp. depth (inches)	Rate (lb/a)	Sugb inj ratg	New Rrpw cntl ratg
			----------(%)	---------
EPTC+Diallate	4	2.5+1	8	53
Cycloate+TCA+Diallate	4	4+6+1	0	53
Diethatyl+Cycloate	4	4+4	0	100
Ethofumesate+Cycloate	4	3+4	8	100
Diethatyl+TCA	0	6+6	0	79
Diethatyl+TCA	2	6+6	3	100
Ethofumesate+TCA	0	4+6	0	71
Ethofumesate+TCA	2	4+6	0	99
Diethatyl+EPTC	4	4+2	9	100
TCA+Glyphosate+2,4-D	0	6+.4+.5	0	0
TCA+Glyp+Bromoxynil	0	6+.4+.25	1	0
TCA+Glyp+Endothall	0	6+.4+1.5	0	0
TCA+Glyp+Dicamba	0	6+.4+.12	24	0
Mean			4	58
High mean			24	100
Low mean			0	0
Coeff. of variation			123	13
LSD(1 Percent)			9	15
LSD(5 Percent)			7	11
No. of reps			4	4

Summary

Incorporated diethatyl + TCA and ethofumesate + TCA gave redroot pigweed control superior to preemergence diethatyl+TCA and ethofumesate+TCA. Treatments which included diethatyl or ethofumesate gave redroot pigweed control superior to EPTC+diallate or cycloate+TCA+diallate. Preemergence dicamba caused significant sugarbeet injury.

Soil applied herbicides, St. Thomas 1981. Herbicides were applied and incorporated with a rototiller set 2 or 4 inches deep on May 6. Beta 1443 sugarbeets were planted and preemergence herbicides were applied May 7. About 1 inch of rain fell May 8 and 4.05 inches of rain occurred from May 7 to June 9. Plots were evaluated visually on June 9 and June 25. Weeds were counted in 40 square feet of the treated area of each plot and in 20 square feet of untreated area on each side of the treatment. Sugarbeets were counted in 60 feet of row in treated and untreated areas. Percent stand reduction and percent control on June 25 was averaged to give the combined evaluation parameter.

			---Stand Count Evalu---				-Combined Evaluation-			
Treatment	Incorp. depth (in.)	Rate (lb/a)	Sgbt stand reduc	Rrpw stand reduc	Colq stand reduc	Fxtl stand reduc	Sgbt comb	Rrpw comb	Colq comb	Fxtl comb
			(%)							
Diethatyl	2	6	-11	75	-23	79	-4	64	5	87
Ethofumesate	2	4	-7	88	81	84	-2	92	87	90
Diet+Etho-F	2	3+3	-8	81	51	90	-1	89	73	94
Diethatyl+TCA	2	6+6	-5	91	52	93	0	93	67	96
Diethatyl+TCA	0	6+6	-1	63	-60	83	-1	71	-23	83
Diet+Pyrazon-L	2	6+7	-15	87	72	83	-6	91	81	87
Etho+TCA	2	4+6	-9	90	76	86	-2	94	87	92
Etho+TCA	0	4+6	-6	83	64	78	-3	85	67	81
Etho+Pyrazon-L	2	4+7	-8	93	88	89	-3	96	94	92
EPTC+Diallate	4	2+1	5	43	58	77	7	64	76	89
Cycl+Diallate	4	4+1	3	2	72	83	3	37	84	91
Cycl+TCA+Dial	4	3+6+1	-4	23	90	88	1	49	93	94
Diethatyl+EPTC	4	4+2	11	74	67	75	15	85	82	87
Diet+Cycloate	4	4+3	20	74	55	90	17	86	77	95
Etho+Cycloate	4	3+3	16	78	80	96	14	87	91	97
S-734-F	2	1.5	-7	50	68	86	-2	60	75	93
Diet+S-734-F	2	6+1.5	8	82	51	90	6	83	55	95
Etho+S-734-F	2	4+1.5	5	79	93	98	7	88	94	99
Mean			-1	70	57	86	3	78	70	91
High mean			20	93	93	98	17	96	94	99
Low mean			-15	2	-60	75	-6	37	-23	81
Coeff. of variation			-2274	24	50	9	201	18	23	7
LSD(1 Percent)			28	32	54	14	15	42	48	20
LSD(5 Percent)			21	24	40	11	11	31	35	14
No. of reps			4	4	4	4	2	2	2	2

Summary

Preemergence diethatyl+TCA and ethofumesate+TCA gave or tended to give less weed control than incorporated diethatyl+TCA and ethofumesate+TCA even though rainfall was plentiful following application. The combined evaluation indicated that diethatyl+cycloate, diethatyl+EPTC, and ethofumesate+cycloate were the only treatments that caused significant sugarbeet injury.

Spring Applied Herbicides, Crookston, 1981. Preplant incorporated herbicides were applied and 'Hilleshog 309' sugarbeets were seeded 1.25 inches deep into moist soil on May 5. The rototiller incorporator was set 4 inches deep for diethatyl plus EPTC, diethatyl plus cycloate, and ethofumesate-flowable plus cycloate. All other incorporated treatments were incorporated 2 inches deep. Preemergence diethatyl plus TCA and ethofumesate + TCA were applied May 5 and other preemergence treatments were applied May 12. Weed control and sugarbeet injury were evaluated June 8 and June 29.

Treatment	Rate (lb/a)	--June 8-- Sugb inj ratg	Grft cntl ratg	-----June29----- Grft cntl ratg	Prpw cntl ratg	Sugb inj ratg
		--------------	------	(%)	------	------
Diethatyl PPI	6	20	99	90	100	1
Diet+Ethofumesate PPI	3+3	78	100	99	100	36
Ethofumesate-F PPI	4	29	99	98	100	9
Diet+Pyrazon-L PPI	6+7	15	100	97	100	1
Diet+EPTC PPI	4+2	28	100	97	98	18
TCA+Glyp+Brox Pre	6+.4+.25	31	30	34	0	8
TCA+Glyp+Endothall Pre	6+.4+1.5	9	43	46	1	0
TCA+Glyphosate Pre	6+.4	13	33	40	0	0
TCA+Glyp+Dicamba Pre	6+.4+.12	11	33	53	0	3
TCA+Glyp+2,4-D Pre	6+.4+.5	24	40	40	1	0
Diet+TCA Pre	6+6	20	93	88	80	1
Diet+TCA PPI	6+6	15	97	97	100	5
Diet+Cycloate PPI	4+4	38	97	97	100	13
Etho-F+Cycloate PPI	3+4	25	99	100	100	9
Etho-F+Pyrazon-L PPI	4+7	13	99	97	100	5
Etho-F+TCA Pre	4+6	15	90	76	42	1
Etho-F+TCA PPI	4+6	11	100	98	100	3
Mean		23	79	79	66	7
High mean		78	100	100	100	36
Low mean		9	30	34	0	0
Coeff. of variation		58	11	10	10	105
LSD(1 Percent)		25	17	15	20	13
LSD(5 Percent)		19	13	11	14	10
No. of reps		4	4	4	2	4

Summary

The greatest sugarbeet injury was caused by diethatyl plus ethofumesate. Postemergence herbicides added to TCA plus glyphosate gave sugarbeet injury similar to TCA plus glyphosate alone. The first significant rain following planting was on May 22 to 24. A rain closer to time of application of 2,4-D and dicamba would probably have caused sugarbeet injury. Preemergence TCA gave poor control of green foxtail indicating insufficient rainfall to activate TCA. Preemergence diethatyl plus TCA and ethofumesate plus TCA gave less control of prostrate pigweed than when the same treatments were incorporated.

Postemergence Control of Wild Proso Millet and Green Foxtail, Clara City, 1981. 'Bush Monofort' sugarbeets were seeded April 25, 1981. Herbicides were applied in 17 gpa of water at 40 psi on June 3 when wild proso millet was 3 leaves to tillering (1 to 4 inches tall), green foxtail had 2 to 5 leaves, and sugarbeets had 4 to 6 leaves. Soil moisture was adequate at planting and when the herbicides were applied. Weed control and sugarbeet injury were evaluated June 23.

Treatment	Rate (lb/a)	Sugb inj ratg	Grft cntl ratg (%)	Wipm cntl ratg
Dalapon+Surfactant	3+.5%	5	56	53
BAS 9052+OC	.2+.25G	0	98	95
BAS 9052+OC	.3+.25G	0	99	97
BAS 9052+Desm+OC	.2+1+.25G	0	98	98
BAS 9052+Desm+OC	.3+1+.25G	3	98	97
PP-009+OC	.2+.25G	0	83	86
PP-009+Desm+OC	.2+1+.25G	3	89	88
Diclofop+OC	2+.25G	0	83	66
Dicl+Desm+OC	2+1+.25G	0	91	94
RO 13-8895+OC	.2+.25G	0	90	90
RO 13-8895+OC	.3+.25G	0	99	99
RO 13-8895+Desm+OC	.2+1+.25G	0	81	70
RO 13-8895+Desm+OC	.3+1+.25G	0	78	78
CGA-82725+OC	.2+.25G	0	88	87
CGA-82725+Desm+OC	.2+1+.25G	0	88	89
Desmedipham+Dalapon	1+2	16	91	89
BAS 9052+Desm+Phen+OC	.2+.5+.5+.25G	0	98	97
RO 13-8895+Desm+Phen+OC	.2+.5+.5+.25G	0	79	69
Desmedipham	1	0	46	18
Desmedipham+Phenmedipham	.5+.5	0	68	33
Mean		1	85	79
High mean		16	99	99
Low mean		0	46	18
Coeff. of variation		277	12	12
LSD(1 Percent)		7	19	18
LSD(5 Percent)		5	15	14
No. of reps		4	4	4

Summary

Dalapon and diclofop gave less control of wild proso millet than BAS 9052 + OC, RO 13-8895 + OC, PP-009 + OC, and CGA-82725 +OC. Desmedipham added to RO 13-8895 + OC reduced wild proso millet control compared to RO 13-8895 + OC alone. Desmedipham increased wild proso millet control from dalapon and diclofop, and had no influence on BAS 9052, PP-009, and CGA-82725. Desmedipham + dalapon caused more sugarbeet injury than the other treatments.

Early Postemergence Wild Oat Control, Casselton, 1981. 'Great Western R1' sugarbeets were seeded May 1, 1981. Herbicides were applied in 17 gpa of water at 40 psi on May 21 when the wild oats had 1 to 3 leaves and the sugarbeets were cotyledon to 2 leaves. Soil moisture was marginal at planting and sugarbeet emergence was erratic. No rain fell for 22 days after planting and wild oats were wilted from drouth stress when the herbicides were applied. Rain started May 22 and soil moisture was fair to adequate throughout the rest of the growing season. Wild oat control and sugarbeet injury were evaluated June 20.

Treatment	Rate (lb/a)	June 20 Wioa cntl ratg (%)	June 20 Sugb inj ratg (%)
Barban	1	50	0
Dalapon+Surfactant	3+.5%	30	0
Etho+Dalapon+Surfactant	1+3+.5%	74	0
Diclofop	1.5	66	3
Diclofop+Desm	1.5+1	78	14
BAS 9052+OC	.2+.25G	58	0
BAS 9052+OC	.3+.25G	71	3
BAS 9052+OC	.4+.25G	94	0
BAS 9052+Desm+OC	.2+1+.25G	80	20
BAS 9052+Desm+OC	.3+1+.25G	91	25
BAS 9052+Desm	.2+1	60	13
Bas-90+Desm+Phen+OC	.2+.5+.5+.25G	82	25
Bas-90+Desm+Phen+OC	.3+.5+.5+.25G	95	25
BAS 9052+Endothall+OC	.2+1+.25G	55	4
BAS 9052+OC+Desm T-0&T-15*	.2+.25G+1	93	21
BAS 9052+OC+Desm T-0&T-15*	.3+.25G+1	97	19
Desmedipham	1	14	5
Desmedipham+Phenmedipham	.5+.5	23	5
RO 13-8895+OC	.2+.25G	92	3
RO 13-8895+OC	.3+.25G	95	3
RO 13-8895+Desm+OC	.2+1+.25G	90	16
RO 13-8895+Desm+OC	.3+1+.25G	88	25

(Table continued on next page)

Table . Continued

Treatment	Rate (lb/a)	Wioa cntl ratg (%)	Sugb inj ratg (%)
		June 20	
RO 13-8895+Desm	.2+1	83	16
RO 13-8895+Endo+OC	.2+1+.25G	92	10
CGA-82725+OC	.2+.25G	88	0
CGA-82725+OC	.3+.25G	96	3
CGA-82725+Desm+OC	.2+1+.25G	95	15
CGA-82725+Desm+OC	.3+1+.25G	94	15
CGA-82725+Desm	.2+1	56	8
PP-009+OC	.2+.25G	86	0
PP-009+OC	.3+.25G	90	0
PP-009+Desm+OC	.2+1+.25G	94	15
PP-009+Desm+OC	.3+1+.25G	96	10
PP-009+Desm	.2+1	79	11
Mean		77	10
High mean		97	25
Low mean		14	0
Coeff. of variation		13	68
LSD(1 Percent)		19	12
LSD(5 Percent)		14	9
No. of reps		4	4

* BAS 9052 + OC was applied first and desmedipham applied 15 minutes later.

Summary

The drouth stress when the herbicides were applied probably reduced wild oat control since the level of control was lower than in other experiments where soil moisture was adequate. BAS 9052 at 0.2 lb/A gave less wild oat control than BAS 9052 at 0.4 lb/A. RO 13-8895, CGA-82725, and PP-009 at 0.2 lb/A gave better wild oat control than BAS 9052. The addition of desmedipham, desmedipham plus phenmedipham, or endothall to the herbicides for grass control did not reduce wild oat control. Desmedipham or desmedipham plus phenmedipham added to BAS 9052 plus oil concentrate gave improved wild oat control compared to BAS 9052 plus oil concentrate alone.

Late Postemergence Wild Oat Control, Casselton, 1981. 'Great Western R1' sugarbeets were seeded May 1, 1981. Herbicides were applied in 17 gpa of water at 40 psi on June 5 when the wild oats had 5 leaves, green foxtail had 1 to 2 leaves, and sugarbeets were from cotyledon to 6 leaves. Soil moisture was marginal at planting and no rain fell until May 22. Soil moisture was adequate on June 5 and was fair to adequate throughout the rest of the growing season. Wild oat control was evaluated June 20 and July 20. Sugarbeet injury, green foxtail control and common lambsquarter control were evaluated June 20.

		-------June 20-------				July20
Treatment	Rate (lb/a)	Sugb inj ratg	Wioa cntl ratg	Colq cntl ratg	Grft cntl ratg	Wioa cntl ratg
		------------(%)------------				
Barban	1	0	9	0	0	3
Dalapon+Surfactant	3+.5%	15	18	24	55	60
Etho+Dalapon+Surfactant	1+3+.5%	35	50	74	83	84
Diclofop	1.5	5	28	0	79	78
Bas-9052+OC	.2+.25G	0	94	0	96	95
Bas-9052+OC	.3+.25G	0	99	0	96	100
Bas-9052+OC	.4+.25G	0	100	0	96	100
Bas-9052+Endothall+OC	.2+1+.25G	24	79	0	70	94
RO-13-8895+OC	.2+.25G	0	93	0	91	100
RO-13-8895+OC	.3+.25G	0	93	0	91	100
RO-13-8895+Endothall+OC	.2+1+.25G	35	73	0	72	98
CGA-82725+OC	.2+.25G	0	88	0	92	100
CGA-82725+OC	.3+.25G	0	86	0	86	100
PP-009+OC	.2+.25G	0	88	0	90	100
PP-009+OC	.3+.25G	3	96	0	95	100
Mean		8	73	7	79	87
High mean		35	100	74	96	100
Low mean		0	9	0	0	3
Coeff. of variation		120	13	74	14	15
LSD(1 Percent)		17	18	9	21	25
LSD(5 Percent)		13	13	7	16	19
No. of reps		4	4	4	4	4

Summary

BAS 9052, RO 13-8895, and CGA-82725 gave wild oat control superior to barban, dalapon, and diclofop. Addition of endothall to BAS 9052 and RO 13-8895 reduced control of wild oat and green foxtail compared to BAS 9052 and RO 13-8895 alone. The full effects of RO 13-8895, diclofop, dalapon, CGA-82725, and PP-009 on wild oat had not occurred by June 20, 15 days after application, since wild oat control improved from June 20 to July 20. Evaluations of control from BAS 9052 were similar on June 20 and July 20.

Postemergence herbicides, St. Thomas 1981. Beta 1443 sugarbeets were planted and TCA was applied at 6 lb/A over the entire plot area on May 7. About 1 inch of rain fell May 8 and 4.05 inches of rain occurred from May 7 to June 9. Postemergence herbicides were applied June 9 when redroot pigweed were emerging to 1.5 inches, green foxtail was 0.5 to 3 inches, common lambsquarters was 1 to 3 inches and sugarbeets had 4 to 6 leaves. Plots were evaluated visually June 25. Weeds were counted in 40 square feet of the treated area of each plot and in 20 square feet of untreated area on each side of the treatment. Sugarbeets were counted in 60 feet of row in treated and untreated areas. Percent stand reduction and percent control were averaged to give the combined evaluation parameter.

Treatment	Rate (lb/a)	--Stand Count Eval-- Sgbt --Stand (%)	Rrpw	Colq Reduction--	Fxtl	-Visual Evaluation- Sgbt inj ratg	Rrpw cntl ratg	Colq cntl ratg	Fxtl cntl ratg
Desmedipham	1	3	63	82	27	1	80	85	45
Desmedipham+Dalapon	1+2	-8	71	65	57	15	95	94	93
Ethofumesate+Desmedipham	1.5+.75	-6	77	100	52	6	94	100	78
Etho-F+Desmedipham	1.5+.75	1	72	99	17	6	93	100	63
Desmedipham+BAS 9052+OC	1+.2+.25G	7	83	84	87	10	98	97	100
BAS 9052+OC	.2+.25G	5	20	20	96	0	0	0	100
Endothall+BAS 9052+OC	1+.2+.25G	6	20	-21	93	0	0	0	100
Desmedipham+Phenmedipham	.5+.5	-2	40	69	53	1	73	93	75
Desm+Phen+BAS 90+OC	.5+.5+.2+.25G	-15	67	96	88	10	91	100	100
Desmedipham+Endothall	1+.5	-6	50	57	24	1	81	88	68
Desm+Endo+BAS 90+OC	1+.5+.2+.25G	-11	68	72	90	5	93	96	100
Desmedipham+Phenmed (SN503)	.5+.5	-2	30	77	38	1	71	95	74
Metamitron+Desmedipham *	4+1	0	0	0	0	0	0	0	0
Mean		-2	51	61	56	4	67	73	76
High mean		7	83	100	96	15	98	100	100
Low mean		-15	0	-21	0	0	0	0	0
Coeff. of variation		-512	23	40	27	81	7	5	12
LSD(1 Percent)		20	23	47	29	7	9	7	17
LSD(5 Percent)		15	17	35	22	5	6	5	13
No. of reps		4	4	4	4	4	4	4	4

* Formed a precipitate.

(Experiment continued on next page)

Postemergence herbicides, St. Thomas 1981. (continued)

Treatment	Rate (lb/a)	----Combined Sgbt comb	Rrpw comb	Evaluation---- Colq comb	Fxtl comb
		-------------	------------(%)	------------	
Desmedipham	1	2	72	84	36
Desmedipham+Dalapon	1+2	4	83	80	75
Ethofumesate+Desmedipham	1.5+.75	2	86	100	65
Etho-F+Desmedipham	1.5+.75	4	83	100	40
Desm+BAS 9052+OC	1+.2+.25G	9	91	91	94
BAS 9052+OC	.2+.25G	3	10	10	98
Endothall+BAS 9052+OC	1+.2+.25G	3	10	-11	97
Desmedipham+Phenmedipham	.5+.5	-1	57	81	64
Desm+Phen+BAS 90+OC	.5+.5+.2+.25G	-3	79	98	94
Desmedipham+Endothall	1+.5	-3	66	73	46
Desm+Endo+BAS 90+OC	1+.5+.2+.25G	-3	81	84	95
Desmedipham+Phenmed (SN503)	.5+.5	-1	51	86	56
Metamitron+Desmedipham *	4+1	0	0	0	0
Mean		1	59	67	66
High mean		9	91	100	98
Low mean		-3	0	-11	0
Coeff. of variation		581	23	16	16
LSD(1 Percent)		21	41	32	33
LSD(5 Percent)		15	29	23	24
No. of reps		2	2	2	2

* Formed a precipitate.

Summary

Metamitron + desmedipham formed a precipitate when mixed and no weed control evaluations were made for this treatment. The following observations were based on visual evaluations. Desmedipham+dalapon, ethofumesate+desmedipham, and desmedipham+BAS 9052+ oil concentrate gave more sugarbeet injury and better broadleaf and grass control than desmedipham alone. Desmedipham+phenmedipham gave less control of redroot pigweed but better control of common lambsquarters and green foxtail than desmedipham alone. Ethofumesate EC + desmedipham gave better control of green foxtail than ethofumesate-flowable + desmedipham. The premixed formation of desmedipham + phenmedipham gave weed control similar to the tank mix.

Postemergence Herbicides, Thompson, 1981. 'Hilleshog 309' sugarbeets were seeded May 9, 1981. Herbicides were applied at 3:00 pm at 72F in 17 gpa water at 40 psi on June 9 when sugarbeets had 4 to 6 leaves, green foxtail was 0.5 to 3 inches tall, redroot pigweed was 0.25 to 1 inch tall, and quackgrass was 10 to 12 inches tall. Soil moisture was adequate at planting and when herbicides were applied. Weed control and sugarbeet injury were evaluated June 25.

Treatment	Rate (lb/a)	Sugb inj ratg	Grft cntl ratg	Rrpw cntl ratg	Qugr cntl ratg
		(%)			
Desmedipham	1	3	39	92	5
Desm+BAS 9052	1+.2	3	100	99	10
Desm+BAS 90+OC	1+.2+.25G	18	100	100	40
Desm+BAS 90+CO	1+.2+.25G	11	100	100	53
BAS 9052+OC	.2+.25G	0	100	0	55
Endothall+Dalapon+Surfactant	1+2+.5%	8	98	47	24
Desm+Dalapon	1+2	24	98	100	39
Desm+Endothall	1+.5	9	80	97	3
Endothall+BAS 9052+OC	1+.2+.25G	13	100	40	25
Desm+Phenmedipham	.5+.5	3	80	98	15
Desm+Phen+BAS 90+OC	.5+.5+.2+.25G	31	100	100	68
Et+De+Phen+BAS 90+OC	1.5+.4+.4+.2+.25G	50	100	100	75
Etho+Desm+Phen	1.5+.4+.4	38	98	100	20
Et+De+Phen+BAS 9052	1.5+.4+.4+.2	30	100	100	24
Et+De+Phen+BAS 90+CO	1.5+.4+.4+.2+.25G	45	100	100	65
Trifluralin+Desm	.75+1	3	65	99	5
Propachlor+Desm	5+1	54	84	100	13
Acifluorfen (Tackle)	.25	43	43	96	0
Acifluorfen (Tackle)	.5	86	84	100	0
Acifluorfen (Blazer)	.25	79	75	98	0
Acifluorfen (Blazer)	.5	93	91	100	0
Diethatyl	6	0	84	85	0
Mean		29	87	89	24
High mean		93	100	100	75
Low mean		0	39	0	0
Coeff. of variation		26	8	5	37
LSD(1 Percent)		14	13	7	17
LSD(5 Percent)		11	10	6	13
No. of reps		4	4	4	4

Summary

All treatments including desmedipham and acifluorfen gave excellent control of redroot pigweed. All treatments including BAS 9052 gave excellent control of green foxtail while none of the treatments gave excellent control of quackgrass. Acifluorfen (Tackle) at 0.25 lb/A gave less sugarbeet injury and less foxtail control than acifluorfen (Blazer) at 0.25 lb/A. Desmedipham plus BAS 9052 plus oil concentrate gave more sugarbeet injury than desmedipham plus BAS 9052. Ethofumesate in combination with several herbicides gave more sugarbeet injury than the same herbicide treatment without ethofumesate. Postemergence trifluralin plus desmedipham and postemergence diethatyl did not injure sugarbeets but postemergence propachlor plus desmedipham caused severe sugarbeet injury.

Postemergence herbicides, Crookston 1981. Hilleshog 309 sugarbeets were planted and TCA at 6 lb/A was applied over the entire plot area on May 5, 1981. Early postemergence treatments were applied to the center four rows of six-row plots June 8 when sugarbeets had 4 to 6 leaves and green foxtail was 1/2 to 2 inches tall. Late postemergence treatments were applied June 16 when the sugarbeets had 6 to 8 leaves and green foxtail was 1/2 to 9 inches tall. Sugarbeet injury was evaluated visually on June 29 and green foxtail control was evaluated on June 29 and July 22.

			-----June29-----		July 22
Treatment	Time of Application	Rate (lb/a)	Fxtl cntl ratg	Sugb inj ratg	Fxtl cntl ratg
			--------------	(%)	------------
Diethatyl	June 8	6	84	4	79
Acifluorfen (Tackle)	June 8	.25	76	31	55
Acifluorfen (Blazer)	June 8	.25	80	39	71
Acifluorfen (Tackle)	June 8	.5	90	65	88
Acifluorfen (Blazer)	June 8	.5	93	78	94
Acifluorfen (Tackle)	June 16	.25	58	25	61
Acifluorfen (Blazer)	June 16	.25	65	28	54
Acifluorfen (Tackle)	June 16	.5	75	44	83
Acifluorfen (Blazer)	June 16	.5	78	50	86
Desmedipham	June 8	1	75	0	50
Ethofumesate-F+Desm	June 8	1.5+.75	83	11	61
Ethofumesate+Desm	June 8	1.5+.5	89	10	83
Etho-F+Desm+CO	June 8	1.5+.75+.25G	94	14	89
Etho+Desm+CO	June 8	1.5+.75+.25G	97	11	96
Mean			81	29	75
High mean			97	78	96
Low mean			58	0	50
Coeff. of variation			10	27	15
LSD(1 Percent)			16	15	22
LSD(5 Percent)			12	11	16
No. of reps			4	4	4

Summary

Diethatyl applied postemergence lay-by treatment gave about 80% green foxtail control and negligable sugarbeet injury. Acifluorfen caused severe sugarbeet injury. June 16 applications caused less injury than June 8 applications and sugarbeets treated on June 16 recovered more completely from the injury. Ethofumesate flowable+desmedipham+crop oil gave better control of green foxtail than ethofumesate flowable+desmedipham.

Postemergence wild oat control in wheat, Fargo. Era wheat was seeded April 30 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat May 22 and 3.5 to 4-leaf wheat and wild oat June 5. Rainfall for a 1 week period following application at the 1.5 to 2-leaf and 3.5 to 4-leaf stage was 3.3 and 0.9inch, respectively. Herbicides were applied with a bicycle-wheel plot sprayer delivering 8.5 gpa at 35 psi except barban which was applied in 4.5gpa at 45 psi. The experiment was a randomized complete block with 4 replications. Experimental units were 8 by 24 ft. Wild oat control and wheat injury ratings were on July 17. Wild oat density was 30 plants/ft sq.

Treatment	Rate oz/A	--------Wheat-------- Yield bu/A	%ir	%sr	%Cont Wioa
Barban 2-lf	6	26.4	0	0	66
Barban+Nitrogen 2-lf	6+1G	29.1	0	0	71
Barban+MSMA 2-lf	4+32	27.2	0	0	38
Diclofop 2-lf	12	31.8	0	0	88
Diclofop 2-lf	16	32.5	0	0	88
Diclofop+Bromoxynil 2-lf	12+4	33.8	1	0	80
Diclofop+MSMA 2-lf	8+32	33.0	1	0	76
Barban 3.5-lf	8	25.7	0	0	53
Barban+Nitrogen 3.5-lf	8+1G	27.4	1	0	71
Barban+MSMA 3.5-lf	4+24	30.0	9	0	86
Diclofop 3.5-lf	16	35.1	0	0	96
Diclofop 3.5-lf	20	33.1	3	0	96
Diclofop+Bromoxynil 3.5-lf	16+4	33.8	3	0	95
Diclofop+MSMA 3.5-lf	8+24	35.6	6	0	94
Difenzoquat 3.5-lf	12	28.0	8	0	91
Difenzoquat 3.5-lf	16	29.1	14	0	97
Difenzoquat-DF 3.5-lf	12	27.9	6	0	95
Difenzoquat-DF 3.5-lf	16	31.1	8	0	98
Difenzoquat+Brox+MCPA 3.5-lf	12+4+4	32.1	5	0	92
Difenzoquat+MSMA 3.5-lf	8+24	32.1	5	0	94
SD45328 3.5-lf	3	31.1	5	0	93
SD45328 3.5-lf	4	35.2	4	0	97
Flamprop 3.5-lf	8	32.5	6	0	95
MSMA 3.5-lf	32	30.3	4	0	88
Control		18.0	0	0	0
Mean		30.5	4	0	81
High mean		35.6	14	0	98
Low mean		18.0	0	0	0
Coeff. of variation		14.0	94	0	11
LSD(1 Percent)		7.9	6	0	17
LSD(5 Percent)		6.0	5	0	13
No. of reps		4.0	4	4	4

Summary

Wheat injury ranged from 0 to 14%; however, no treatment reduced wheat stand. Wild oat control with barban was not increased by nitrogen or MSMA at the 2-leaf stage but increased 18 and 32%; respectively at the 3.5-leaf stage. Wild oat control with diclofop was slightly better at the 3.5 than 2-leaf stage and was not influenced by the addition of bromoxynil. Wild oat control with difenzoquat was not influenced by formulation or bromoxynil and MCPA. Wild oat control with SD-45328 at 3 oz/A was similar to control with flamprop at 8 oz/A. Herbicide treatments increased wheat yields 8 to 18 bu/A.

Postemergence wild oat control in wheat, Minot 1981. Coteau wheat was seeded April 10 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat May 6 and 3.5 to 4-leaf wheat and wild oat May 19. Rainfall for a 1 week period following application at the 1.5 to 2 leaf and 3.5 to 4-leaf stage was 0.1 and 0.7 inch; respectively. Herbicides 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. Experimental units were 8 by 16ft. Wild oat control and crop injury ratings were on July 8. Wild oat density was 30 plants/ft square.

Treatment	Rate oz/A	-------Wheat------ Yield bu/A	%ir	% Cont Wioa
Barban 2-lf	6	13.9	0	77
Barban+Nitrogen 2-lf	6+1G	13.2	0	86
Barban+MSMA 2-lf	4+32	13.8	0	82
Diclofop 2-lf	12	15.9	0	73
Diclofop 2-lf	16	13.6	0	79
Diclofop+Bromoxynil 2-lf	12+4	13.1	0	82
Diclofop+MSMA 2-lf	8+32	15.5	0	86
Barban 3.5-lf	8	14.5	0	72
Barban+Nitrogen 3.5-lf	8+1G	14.8	0	75
Barban+MSMA 3.5-lf	4+24	12.7	0	83
Diclofop 3.5-lf	16	18.6	0	94
Diclofop 3.5-lf	20	18.6	0	97
Diclofop+Bromoxynil 3.5-lf	16+4	16.6	0	91
Diclofop+MSMA 3.5-lf	8+24	16.8	0	91
Difenzoquat 3.5-lf	12	11.1	0	60
Difenzoquat 3.5-lf	16	11.3	0	66
Difenzoquat-DF 3.5-lf	12	11.5	0	65
Difenzoquat-DF 3.5-lf	16	12.5	0	55
Difenzoquat+Brox+MCPA 3.5-lf	12+4+4	11.9	0	72
Difenzoquat+MSMA 3.5-lf	8+24	15.3	0	87
SD45328 3.5-lf	3	12.3	1	79
SD45328 3.5-lf	4	13.9	1	80
Flamprop 3.5-lf	8	12.5	1	85
MSMA 3.5-lf	32	12.5	0	71
Control		8.4	0	0
Mean		13.8	0	75
High mean		18.6	1	97
Low mean		8.4	0	0
Coeff. of variation		15.2	553	14
LSD(1 Percent)		3.9	2	19
LSD(5 Percent)		2.9	1	14
No. of reps		4.0	4	4

Summary

Little wheat injury was observed with any treatment. Wild oat control with barban was increased only slightly by the addition of N or MSMA at both stages of application. Wild oat control with diclofop was better at the 3.5 than 2-leaf stage and was not influenced by the addition of bromoxynil or MSMA. Wild oat control with difenzoquat was not influenced by formulation but was increased slightly by the addition of MSMA. Wild oat control with SD-45328 at 3 or 4 oz/A was similar to flamprop at 8 oz/A. Wheat yields were closely related to wild oat control.

Postemergence wild oat control in wheat, Langdon 1981. Cando durum was seeded June 8 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat on June 24 and 3.5 to 4-leaf wheat on July 6. Rainfall for a 1 week period following application at the 1.5 to 2-leaf and 3.5 to 4 leaf stage was 0.8 and 0.9 inch, respectively. Herbicides 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. Experimental units were 8 by 16 ft. Weed control and injury ratings were on August 5.

Treatment	Rate oz/A	Wheat %ir	----Percent Fxtl	control---- Colq	Taoa
Barban 2-lf	6	0	0	0	75
Barban+Nitrogen 2-lf	6+1G	0	0	0	90
Barban+MSMA 2-lf	4+32	10	90	89	95
Diclofop 2-lf	12	0	78	0	85
Diclofop 2-lf	16	0	86	0	90
Diclofop+Bromoxynil 2-lf	12+4	0	85	95	90
Diclofop+MSMA 2-lf	8+32	9	93	93	95
Barban 3.5-lf	8	0	0	0	60
Barban+Nitrogen 3.5-lf	8+1G	1	0	0	75
Barban+MSMA 3.5-lf	4+24	13	94	96	95
Diclofop 3.5-lf	16	0	68	0	80
Diclofop 3.5-lf	20	0	48	0	80
Diclofop+Bromoxynil 3.5-lf	16+4	1	93	98	85
Diclofop+MSMA 3.5-lf	8+24	14	93	93	95
Difenzoquat 3.5-lf	12	3	0	0	90
Difenzoquat 3.5-lf	16	0	0	0	90
Difenzoquat-DF 3.5-lf	12	4	0	0	90
Difenzoquat-DF 3.5-lf	16	3	0	0	90
Difenzoquat+Brox+MCPA 3.5-lf	12+4+4	0	0	100	90
Difenzoquat+MSMA 3.5-lf	8+24	15	93	98	99
SD45328 3.5-lf	3	0	0	0	95
SD45328 3.5-lf	4	0	0	0	95
Flamprop 3.5-lf	8	0	0	0	99
MSMA 3.5-lf	32	16	93	94	80
Control		0	0	0	0
Mean		4	40	34	84
High mean		16	94	100	99
Low mean		0	0	0	0
Coeff. of variation		74	35	7	0
LSD(1 Percent)		5	27	4	0
LSD(5 Percent)		4	20	3	0
No. of reps		4	4	4	1

Summary

Wheat was injured 9 to 16% by treatments with MSMA. Foxtail control was good with diclofop at the 2-leaf stage or with treatments containing MSMA. Common lambsquarter control was good with bromoxyil or MSMA.

Wild oat control in wheat, Williston 1981. Len wheat was seeded April 10 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-lf wheat and wild oat on May 7 and 3.5 to 4-leaf wheat and wild oat May 20. Herbicides were applied with a bicycle wheel plot sprayer delivering 8.5gpa at 35 psi except barban which was applied at 4.5 gpa at 45 psi. The experiment was a randomized complete block with 4 replications. Experimental units were 8 by 25 ft. Wild oat control and wheat injury ratings were on July 9. Wild oat density was 8 plants/sq. ft.

		Wheat				
Treatment	Rate oz/A	Yield bu/A	Twt lb/bu	%ir	Height (cm)	% Cont Wioa
Barban 2-lf	6	29.7	57.4	1	80	79
Barban+Nitrogen 2-lf	6+1G	32.7	58.3	1	80	85
Barban+MSMA 2-lf	4+32	35.5	57.4	0	75	91
Diclofop 2-lf	12	33.4	56.5	0	78	65
Diclofop 2-lf	16	35.7	56.5	0	76	95
Diclofop+Bromoxynil 2-lf	12+4	34.1	53.9	0	80	85
Diclofop+MSMA 2-lf	8+32	33.9	52.5	0	80	93
Barban 3.5-lf	8	33.8	51.1	0	80	80
Barban+Nitrogen 3.5-lf	8+1G	31.5	53.3	1	77	92
Barban+MSMA 3.5-lf	4+24	31.9	54.7	3	77	93
Diclofop 3.5-lf	16	32.0	55.3	0	74	87
Diclofop 3.5-lf	20	33.1	55.6	1	77	89
Diclofop+Bromoxynil 3.5-lf	16+4	30.9	57.0	0	68	82
Diclofop+MSMA 3.5-lf	8+24	35.2	57.1	0	73	91
Difenzoquat 3.5-lf	12	29.9	55.9	0	72	79
Difenzoquat 3.5-lf	16	31.3	55.2	1	71	90
Difenzoquat-DF 3.5-lf	12	33.3	56.3	1	72	85
Difenzoquat-DF 3.5-lf	16	31.6	57.1	4	73	87
Difenzoquat+Brox+MCPA 3.5-lf	12+4+4	32.2	56.5	0	74	75
Difenzoquat+MSMA 3.5-lf	8+24	31.8	56.3	1	71	91
SD45328 3.5-lf	3	31.9	56.4	0	78	84
SD45328 3.5-lf	4	32.0	57.0	0	76	90
Flamprop 3.5-lf	8	30.2	56.0	0	72	89
MSMA 3.5-lf	32	30.2	55.9	0	70	87
Control		25.4	55.0	0	76	0
Mean		32.1	55.8	1	75	82
High mean		35.7	58.3	4	80	95
Low mean		25.4	51.1	0	68	0
Coeff. of variation		12.0	0.	314	5	10
LSD(1 Percent)		7.1	0.	3	10	15
LSD(5 Percent)		5.4	0.	3	8	12
No. of reps		4.0	1.0	4	2	4

Summary

Little wheat injury was observed with any treatment. Wild oat control was 75% or greater with all treatments except 12 oz/A diclofop applied at the 2-leaf stage. Wild oat control with SD-45328 at 3 oz/A was similar to control with flamprop at 8 oz/A.

Herbex combinations with wild oat herbicides in wheat, Fargo 1981. Era wheat was seeded April 24 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat May 14 and 3.5 to 4-lf wheat and wild oat May 28. Both wheat and wild oat were under moisture stress when applications were made at the 1.5 to 2-leaf stage. First rain after application was 3.3 inch May 22 to 24. In addition 0.3 inch fell within 3 days after application at the 3.5 to 4-leaf stage. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35psi except barban was in 4.5 gpa at 45 psi. The experiment was a randomized complete block with 4 replications. Weed control and injury ratings were on July 17. Wild oat density was 30 plants/ft square.

Treatment	Rate oz/A	------Wheat----- %ir	%sr	% Cont Wioa
Barban 2-lf	4	0	0	62
Barban+Herbex 2-lf	4+.125G	0	0	56
Barban+Herbex 2-lf	3+.187G	0	0	39
Barban+Herbex 2-lf	2+.25G	0	0	21
Diclofop 2-lf	12	0	0	55
Diclofop+Herbex 2-lf	12+.125G	0	0	69
Diclofop+Herbex 2-lf	8+.187G	0	0	28
Diclofop+Herbex 2-lf	6+.25G	0	0	50
Difenzoquat 4-lf	12	4	0	99
Difenzoquat+Herbex 4-lf	12+.125G	3	0	96
Difenzoquat+Herbex 4-lf	8+.187G	0	0	89
Difenzoquat+Herbex 4-lf	6+.25G	0	0	80
MSMA 4-lf	48	3	0	81
MSMA+Herbex 4-lf	48+.125G	1	0	81
MSMA+Herbex 4-lf	32+.187G	5	0	85
MSMA+Herbex 4-lf	24+.25G	0	0	53
Control		0	0	0
Mean		1	0	61
High mean		5	0	99
Low mean		0	0	0
Coeff. of variation		217	0	18
LSD(1 Percent)		4	0	21
LSD(5 Percent)		3	0	16
No. of reps		4	4	4

Summary

Wild oat control with the various herbicides was not increased by the addition of Herbex spray adjuvant. Little crop injury was observed with any treatment.

Wild oat herbicide combinations, Fargo 1981. Era wheat was seeded April 30 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat May 22 and 3.5 to 4-leaf wheat and wild oat June 5. Rain fall for a 1 week period following application at the 1.5 to 2 and 3.5 to 4 leaf stage was 3.3 and 0.9 inch, respectively. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with four replications. Weed control and injury ratings were on July 17. Wild oat density was 30 plants/ft square.

Treatment	Rate oz/A	---------Percent control--------- %ir	%sr	Wioa
Barban 2-lf	4	0	0	64
SD45328 2-LF	3	5	0	92
Diclofop 2-lf	8	1	0	76
Difenzoquat 2-lf	8	3	0	37
Barban+SD45328 2-lf	4+3	4	0	86
Barban+Diclofop 2-lf	4+8	1	0	91
Barban+Difenzoquat 2-lf	4+8	0	0	84
Diclofop+SD45328 2-lf	8+3	1	0	86
Diclofop+Difenzoquat 2-lf	8+8	0	0	84
Difenzoquat+SD45328 2-lf	8+3	0	0	65
Barban 4-lf	4	0	0	55
SD45328 4-lf	3	7	0	94
Diclofop 4-lf	8	7	0	67
Difenzoquat 4-lf	8	3	0	85
Barban+SD45328 4-lf	4+3	6	0	93
Barban+Diclofop 4-lf	4+8	3	0	88
Barban+Difenzoquat 4-lf	4+8	6	0	90
Diclofop+SD45328 4-lf	8+3	9	0	96
Diclofop+Difenzoquat 4-lf	8+8	8	0	94
Difenzoquat+SD45328 4-lf	8+3	11	0	95
Control		0	0	0
Mean		4	0	77
High mean		11	0	96
Low mean		0	0	0
Coeff. of variation		128	0	22
LSD(1 Percent)		8	0	32
LSD(5 Percent)		6	0	24
No. of reps		4	4	4

Summary

Wild oat control was excellent with 3 oz/A SD-45328 at both the 2 and 4-leaf stage. Wild oat control was slightly better with barban-diclofop, barban-difenzoquat, or diclofop-difenzoquat combinations than with the individual herbicides at either stage.

Wild oat herbicide combinations, Minot 1981. Coteau wheat was seeded April 10 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-lf wheat and wild oat May 6 and 3.5 to 4-leaf wheat and wild oat May 19. Rainfall for a 1 week period following application at the 1.5 to 2-leaf and 3.5 to 4-leaf stage was 0.1 and 0.7 inch, respectively. 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. Experimental units were 8 by 16 ft. Wild oat control and crop injury ratings were on July 8. Wild oat density was 30 plants/ft square.

Treatment	Rate oz/A	---------Wheat------- Yield bu/A	%ir	% Cont Wioa
Barban 2-lf	4	17.3	0	80
SD45328 2-LF	3	14.4	0	70
Diclofop 2-lf	8	14.3	0	76
Difenzoquat 2-lf	8	12.0	0	53
Barban+SD45328 2-lf	4+3	18.5	0	81
Barban+Diclofop 2-lf	4+8	17.5	0	90
Barban+Difenzoquat 2-lf	4+8	15.1	0	70
Diclofop+SD45328 2-lf	8+3	16.1	0	84
Diclofop+Difenzoquat 2-lf	8+8	16.0	0	77
Difenzoquat+SD45328 2-lf	8+3	15.3	0	65
Barban 4-lf	4	13.7	0	38
SD45328 4-lf	3	15.9	0	83
Diclofop 4-lf	8	15.3	0	81
Difenzoquat 4-lf	8	9.7	0	48
Barban+SD45328 4-lf	4+3	12.3	1	71
Barban+Diclofop 4-lf	4+8	15.8	1	89
Barban+Difenzoquat 4-lf	4+8	12.9	0	55
Diclofop+SD45328 4-lf	8+3	16.3	0	93
Diclofop+Difenzoquat 4-lf	8+8	15.0	0	81
Difenzoquat+SD45328 4-lf	8+3	12.8	0	66
Control		8.2	0	0
Mean		14.5	0	69
High mean		18.5	1	93
Low mean		8.2	0	0
Coeff. of variation		21.5	632	13
LSD(1 Percent)		5.9	1	17
LSD(5 Percent)		4.4	1	13
No. of reps		4.0	4	4

Summary

Little crop injury was observed with any treatment. Wild oat control was slightly better with barban-diclofop or diclofop-SD-45328 combinations than with the herbicides alone at both stages of application.

New postemergence herbicides for wild oat control, NW-22 Fargo
Era wheat was seeded April 24 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat May 14 and 3.5 to 4-leaf wheat and wild oat, May 29. Both wild oat and wheat were growing under moisture stress when applications were made at the 1.5 to 2-leaf stage. First rain after application was 3.3 inch rain fell over a 3 day period May 22 to 24. In addition 0.3 inch rain fell within 3 days after application at the 3.5 to 4 leaf stage. Herbicides were applied with a bicycle-wheel plot sprayer delivering 8.5 gpa at 35 psi except barban which was applied in 4.5 gpa at 45 psi. The experiment was a randomized complete block with 4 replications. Experimental units were 8 by 24 foot plots. Weed control and wheat injury ratings were on July17. Wild oat density was 30 plants/ft sq.

Treatment	Rate oz/A	--------Wheat-------- Yield bu/A	%ir	%sr	%Cont Wioa
Barban 2-lf	6	28.9	0	0	63
Diclofop 2-lf	12	31.7	0	0	68
Mefluidide 2-lf	0.5	9.6	19	4	23
Mefluidide+Aciflurofen 2-lf	0.5+4	19.6	0	0	9
CGA-82725 2-lf	2	35.8	0	0	45
CGA-82725 2-lf	4	40.0	0	0	84
CGA-82725 2-LF	6	41.2	0	0	83
SSH-0860+OC 2-lf	24+.25G	37.1	0	0	71
Hexazinone 2-lf	1	22.1	0	0	16
Hexazinone+DPX-4189 2-lf	1+0.5	24.7	0	0	26
Difenzoquat 4-lf	12	41.9	1	0	98
MSMA 4-lf	32	36.7	0	0	73
MSMA+DPX-4189 4-lf	24+0.5	34.4	0	0	73
CGA-82725 4-lf	2	46.5	1	0	97
CGA-82725 4-lf	4	48.2	1	0	100
CGA-82725 4-lf	6	44.6	3	0	100
Control		17.0	0	0	0
Mean		32.9	1	0	60
High mean		48.2	19	4	100
Low mean		9.6	0	0	0
Coeff. of variation		15.5	154	825	22
LSD(1 Percent)		9.6	4	3	25
LSD(5 Percent)		7.2	3	3	19
No. of reps		4.0	4	4	4

Summary

Wild oat control with CGA-82725 was better at the 4 than 2-leaf stage of application. Wheat yields were increased 19 to 24 bu/A and 28 to 30 bu/A by CGA-82725 application at the 2 and 4-lf stage; respectively, compared to the untreated control. Postemergence wild oat control with SSH0860 was similar to control with barban or diclofop. Mefluidide at 0.5 oz/A injured wheat which resulted in a significant yield reduction compared to the untreated control.

Hard red spring wheat response to herbicides, Fargo. An experiment was conducted on silty clay soil with pH 7.5 and 6% organic matter to evaluate hard red spring wheat cultivar response to several herbicides. Wheat cultivars were seeded April 17 in 6 inch row spacings. SSH-0860 was applied preemergence and harrow incorporated once (PEI) on April 23. Post treatments were applied to 2 to 2.5-leaf wheat on May 15 or 4.5 to 5-leaf wheat June 4. First rain was 3.3 inch over a 3 day period of May 22 to 24. In addition 1.25 inch of rain fell during the first two weeks of June. SSH-0860 was applied in 17 gpa and postemergence treatments in 8.5 gpa at 35 psi. The experiment was a randomized complete block with a split-block arrangement and 3 replications.

Treatment	Stage	Rate lb/A	Waldron	Alex	Butte	Cultivar Solar (Yield bu/A)	Walera	Era	Mean
SSH-0860	PEI	2	35	42	25	28	27	31	31
Prnl+MCPA	2	1.1+0.25	33	47	23	32	28	31	32
Prnl+MCPA	2	2+0.25	37	44	26	29	27	30	32
Prnl(F)+MCPA	2	1.1+0.25	37	42	24	27	24	27	31
Prnl(F)+MCPA	2	2+0.25	35	44	24	28	28	30	32
Chlorsulfuron	2	0.06	37	46	30	30	28	32	34
Prnl+MCPA	5	1.1+0.25	32	38	18	26	24	28	28
Chlorsulfuron	2	0.06	32	41	24	27	24	28	30
Difenzoquat	5	1	17	31	26	31	29	34	28
Difenzoquat(SP)	5	1	15	31	24	28	27	28	26
SD-45328	5	0.25	34	36	24	27	27	29	30
Control			34	41	26	28	26	28	31
		Mean	32	40	24	28	27	30	

LSD 0.05 Trt=3 Cult=2 Trt by Cult=8

Summary

Difenzoquat, regardless of formulation, and propanil plus MCPA applied at the 5-leaf stage reduced yield when averaged over cultivar. However, yield reductions with both difenzoquat and propanil plus MCPA were cultivar dependent. Difenzoquat reduced yield of Waldron and Alex and propanil plus MCPA Butte wht.

Durum wheat response to herbicides, Fargo. An experiment was conducted on silty clay soil with pH 7.5 and 6% organic matter to evaluate durum wheat cultivar response to several herbicides. Cultivars were seeded April 17 in 6 inch row spacings. SSH-0860 was applied preemergence and harrow incorporated once (PEI) on April 23. Post treatments were applied to 2 to 2.5-leaf wheat on May 15 or 4.5 to 5-leaf wheat on June 4. First rain was 3.3 inch over a 3 day period of May 22 to 24. In addition 1.25 inch of rain fell during the first two weeks of June. SSH-0860 was applied in 17 gpa and postemergence treatments in 8.5 gpa at 35 psi. The experiment was a randomized complete block with a split-block arrangement and 3 replications.

			Cultivar				
Treatment	Stage	Rate lb/A	Calvin	Edmore	Vic	Ward	Mean
			(Yield bu/A)				
SSH-0860	PEI	2	39	34	33	36	36
Propanil+MCPA	2	1.1+0.25	34	30	32	35	33
Propanil+MCPA	2	2+0.25	33	30	29	32	31
Propanil(F)+MCPA	2	1.1+0.25	31	31	28	34	31
Propanil(F)+MCPA	2	2+0.25	37	31	33	35	34
Chlorsulfuron	2	0.06	36	33	33	31	33
Propanil+MCPA	5	1.1+0.25	27	26	22	23	24
Chlorsulfuron	5	0.06	33	30	33	38	33
Difenzoquat	5	1	37	22	24	39	30
Difenzoquat(SP)	5	1	34	20	24	35	28
SD-45328	5	0.25	34	35	33	37	35
Control			36	31	31	35	33
		Mean	34	30	30	34	
		LSD 0.05	Trt=34	Cult=2	Trt by Cult=8		

Summary

Difenzoquat, regardless of formulation, and propanil plus MCPA applied at the 5-leaf stage reduced yield when averaged over cultivar. However, yield reductions with both difenzoquat and propanil plus MCPA were cultivar dependent. Difenzoquat reduced yield of Edmore and Vic and propanil plus MCPA Calvin, Vic, and Ward durum wheat.

Barley response to herbicides, Fargo. An experiment was conducted on silty clay soil with pH 7.5 and 6% organic matter to evaluate barley cultivar response to several herbicides. Barley cultivars were seeded April 17 in 6 inch row spacings. SSH-0860 was applied preemergence and harrow incorporated once (PEI) on April 23. Post treatments were applied to 2 to 2.5-leaf barley on May 15 or 4.5 to 5-leaf barley on June 4. First rain was 3.3 inch over a 3day period of May 22 to 24. In addition 1.25 inch of rain fell during the first two weeks of June. SSH-0860 was applied in 17 gpa, postemergence treatments in 8.5 gpa at 35 psi. The experiment was a randomized complete block with a split-block arrangement and 3 replications.

	Treatment					
	SSH-0860	Dicamba	Chlorsulfuron			
	2 leaf			5 leaf		
Cultivar	PEI 2lb/A	0.12 lb/A	0.06 lb/A (Yield bu/A)	0.06 lb/A	Control	Mean
Larker	48	50	42	50	47	47
Glenn	46	42	38	47	42	43
Bonanza	45	52	42	51	46	47
Hector	44	44	39	43	42	42
Park	48	49	50	48	43	48
Vanguard	34	34	36	33	32	34
Manker	43	47	47	43	44	45
Beacon	49	51	48	54	49	50
Bumper	52	54	51	56	50	53
Morex	49	44	42	53	47	47
Mean	46	47	44	47	44	

LSD 0.05 Trt=NS Cult=3 Trt by Cult=NS

Summary

Barley yields when averaged over cultivar were not reduced by any treatment. Bumper was the highest yielding and Vanguard the lowest yielding cultivar in this trial.

Barley response to propanil plus MCPA, Fargo. An experiment was conducted on silty clay soil with pH 7.5 and 6% organic matter to evaluate barley cultivar response to propanil plus MCPA. Barley cultivars were seeded April 17 in 6 inch row spacings. Treatments were applied in 8.5 gpa at 35 psi to 2 to 2.5-leaf barley on May 15 or 4.5 to 5-leaf barley on June 4. First rain was 3.3 inch over a 3 day period May 22 to 24. In addition 1.25 in rain fell during the first two weeks of June. The experiment was a randomized complete block with a split-block arrangement and 3 replications.

	Treatment				
	2 leaf		5 leaf		
	1.1+0.25 lb/A	2+0.25 lb/A	2+0.25 lb/A	Control	mean
Cultivar		(Yield bu/A)			
Larker	37	34	15	47	33
Glenn	42	27	8	42	30
Bononza	42	27	11	46	32
Hector	43	35	12	42	36
Park	45	40	18	43	37
Vanguard	30	25	10	32	24
Manker	43	35	12	44	34
Beacon	48	42	11	49	38
Bumper	45	40	20	50	39
Morex	43	44	10	47	36
Mean	42	35	13	44	
LSD 0.05	Trt=4	Cult=3	Trt by Cult=11		

Summary

Barley yields when averaged over cultivar were reduced 21 and 71% by propanil plus MCPA at 2+0.25 lb/A at the 2 and 5-lf stage, respectively. Yield reductions ranged from 7 (Morex) to 42% (Bonanza) at the 2-leaf and from 60 (Bumper) to 81% (Glenn) at the 5-leaf stage.

Triallate depth of incorporation, Fargo. Triallate was applied and field cultivator or harrow incorporated twice (PPI), Era wheat treated or non-treated with carboxin seeded, and triallate applied and harrow incorporated twice (PEI) April 14. The soil was dry to a depth of 2 inch and rainfall for a 2 week period following application totaled 0.4 inch. All treatments were applied with a bicycle-wheel plot sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with 4 replications. Experimental units were 8 by 22 ft. Wild oat control and wheat injury ratings were on July 10. Wild oat density was 30 plants/ft sq.

Treatment	Rate lb/A	-----Wheat----- Yield bu/A	%sr	%Control Wioa
Triallate PPI-FC	0	10.7	3	0
Triallate PPI-FC	0.5	25.1	0	57
Triallate PPI-FC	0.75	24.9	0	63
Triallate PPI-FC	1	25.2	8	78
Triallate PPI-FC	1.25	23.0	6	78
Triallate PPI-HW	0	13.7	0	0
Triallate PPI-HW	0.5	21.8	0	59
Triallate PPI-HW	0.75	22.5	0	65
Triallate PPI-HW	1	24.1	3	81
Triallate PPI-HW	1.25	22.4	6	77
Triallate&Carboxin PPI-FC	0	10.6	0	0
Triallate&Carboxin PPI-FC	0.5	24.0	0	66
Triallate&Carboxin PPI-FC	0.75	26.0	3	73
Triallate&Carboxin PPI-FC	1	26.8	6	85
Triallate&Carboxin PPI-FC	1.25	27.2	5	80
Triallate PEI	0	11.8	0	0
Triallate PEI	0.5	16.6	0	9
Triallate PEI	0.75	19.1	0	21
Triallate PEI	1	19.9	0	33
Triallate PEI	1.25	22.6	0	44
Mean		20.9	2	48
High mean		27.2	8	85
Low mean		10.6	0	0
Coeff. of variation		19.9	203	26
LSD(1 Percent)		7.8	7	24
LSD(5 Percent)		5.9	6	18
No. of reps		4.0	4	4

Summary

Wild oat control was better with preplant applications field cultivator or harrow incorporated than preemergence applications harrow incorporated. Little wheat injury was observed with any treatment. Triallate treatments increased wheat yield 6 to 15 bu/A compared to the untreated control.

Triallate impregnated on urea fertilizer for wild oat control, Fargo 1980-81. Fall treatments were applied on plowed soils November 5 and not incorporated (FS) or incorporated twice with a field cultivator to a depth of 3 inches (FI) immediately after application. The entire experimental area was field cultivated and harrowed, Era wheat seeded and spring treatments applied and harrow incorporated twice (SI) on April 15. The liquid formulation of triallate was applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi and triallate impregnated on fertilizer spread by hand at a rate of 150 lb of urea/A. The soil was dry to a depth of 2 inches and rainfall for a 2 week period following seeding totalled 0.4 inch. Weed control and wheat injury ratings were on July 2. Wild oat density was 20 plants/ft square.

Treatment		Rate lb/A	-------Wheat------- %ir	%sr	% Cont Wioa
Triallate+Fertilizer	FI	1	0	3	55
Triallate+Fertilizer	FS	1	0	3	43
Triallate liquid	FI	1	0	1	55
Triallate liquid	FS	1	0	0	18
Triallate+Fertilizer	SI	1	0	0	4
Triallate liquid	SI	1	0	0	15
Control			0	0	0
Mean			0	1	27
High mean			0	3	55
Low mean			0	0	0
Coeff. of variation			0	317	49
LSD(1 Percent)			0	6	27
LSD(5 Percent)			0	4	20
No. of reps			4	4	4

Summary

Wild oat control was similar with fall applications of trillate impregnated on fertilizer surface applied or incorporated and the liquid formulation incorporated. No spring treatment controlled wild oat.

Wild oat control in wheat with fall applied herbicides, Fargo 1980-81. Fall treatments were applied on plowed soil October 31 and not incorporated (F) or incorporated twice with a field cultivator to a depth of 3 inches (FI) immediately after application. The entire experimental area was field cultivated and harrowed, spring preplant incorporated treatments applied and field cultivator incorporated twice (SPPI), Era wheat seeded and spring preemergence treatments applied and harrow incorporated twice (SPEI) on April 15. The sprayable formulations (L) were applied with a bicyclewheel sprayer delivering 17 gpa at 35 psi and the granular formulations (G) applied with a cone applicator. The soil was dry to a depth of 2 inches and rainfall for a 2 week period following seeding totalled 0.4inches. Weed control and wheat injury ratings were on July 2. Wild oat density was 20 plants/ft square.

Treatment	Rate lb/A	-------Wheat------- %ir	%sr	% Cont Wioa
Triallate FG+2,4-D	1+.25	0	6	76
Triallate FGI+2,4-D	1+.25	0	0	74
SSH-0860 FL	1.5	0	0	15
SSH-0860 FLI	1.5	0	0	15
SSH-0860 FG	1.5	0	0	15
SSH-0860 FGI	1.5	0	0	0
SSH-0860 FL	2.0	0	0	29
SSH-0860 FLI	2.0	0	0	36
SSH-0860 FG	2.0	0	0	5
SSH-0860 FGI	2.0	0	0	11
UBI-734 F+2,4-D	1+.25	0	0	13
UBI-734 FI+2,4-D	1+.25	0	0	0
SSH-0860 SL PPI	1.5	0	0	26
SSH-0860 SL PPI	2.0	0	0	41
Tria SL PEI+2,4-D	1+.25	0	1	35
UBI-734 SL PEI+2,4-D	1+.25	0	0	6
Control		0	0	0
Mean		0	0	23
High mean		0	6	76
Low mean		0	0	0
Coeff. of variation		0	303	66
LSD(1 Percent)		0	3	29
LSD(5 Percent)		0	2	22
No. of reps		4	4	4

Summary

The only treatments which controlled wild oat were fall applications of granular triallate either surface applied or incorporated.

Fall applied herbicides in wheat, Absaraka. Fall treatments were applied on plowed soil October 30 and not incorporated (FS), incorporated twice with a field cultivator to a depth of 3 (FI-3) or 6 (FI-6) inches immediately after application. The entire experimental area was field cultivated and harrowed, spring preplant incorporated treatments applied and field cultivator incorporated twice (SPPI-Mult) or harrowed twice (SPPI-Harrow), Era wheat seeded, and spring preemergence treatments applied and harrow incorporated twice (SPEI) May 4. All treatments were applied with a bicycle-wheel sprayer delivering 17 gpa at 35 psi. The soil was dry to a depth of 2 inch with no rain until May 22. Weed control and wheat stand reduction and injury ratings were on June 11. Weed density was moderate.

Treatment	Rate lb/A	------Wheat------- bu/A	%ir	%sr	-% Control- Fxtl	Colq
Trifluralin FI-3	0.5	30.8	3	4	97	74
Trifluralin FI-6	0.5	30.3	1	6	96	70
Trifluralin FI-3	.75	40.8	1	8	94	66
Trifluralin FI-6	.75	41.7	4	16	99	84
Triallate FS	1	44.2	0	0	6	0
Triallate FI-3	1	32.7	0	3	0	0
SSH-0860 FI-3	1.5	44.9	0	0	90	100
DPX-4189 FS	.03	43.6	0	0	96	99
DPX-4189 FI-3	.03	49.4	5	4	98	99
Triallate+SSH-0860 FI-3	1+1	39.1	1	4	85	94
Triallate+Trifluralin FI-3	1+.5	44.0	6	15	99	85
Triallate+Trifluralin FI-6	1+.5	37.7	8	27	100	88
Triallate+DPX-4189 FS	1+.03	45.4	4	1	96	100
Triallate+DPX-4189 FI-3	1+.03	48.1	5	3	97	100
Trifluralin SPPI-Mult	0.5	39.7	11	32	98	88
Trifluralin SPPI-Harrow	0.5	36.9	0	9	86	65
SSH-0860 SPPI	1.5	43.6	5	3	90	98
Triallate SPEI	1.0	37.4	0	0	0	0
Trifluralin SPEI	0.5	36.9	0	0	85	69
DPX-4189 SPEI	.03	43.7	3	1	94	99
Triallate+Trifluralin SPEI	1+.5	35.6	8	0	90	79
Triallate+DPX-4189 SPEI	.03+1	42.7	3	0	95	99
Control		34.4	0	0	0	0
Mean		40.2	3	6	78	72
High mean		49.4	11	32	100	100
Low mean		30.3	0	0	0	0
Coeff. of variation		18.7	139	91	7	11
LSD(1 Percent)		13.9	7	10	10	14
LSD(5 Percent)		10.5	6	7	7	11
No. of reps		4.0	4	4	4	4

Summary

Wheat injury with fall applications of trifluralin generally increased as depth of incorporation increased; however, fall applications of trifluralin were safter than spring preplant applications field cultivato inc. Spring preplant applications harrow inc before seeding injured wheat more than preemergence applications harrow inc after seeding. Green foxtail and common lambsquarters control was excellent with fall or spring applications of SSH-0860 and chlorsulfuron and grft control excellent with fall or spring applications of trifluralin.

Triallate and SSH-0860 combinations with other herbicides, Fargo. Era wheat and Park barley were seeded 4/15 in 6 inch row spacings. Herbicide treatments were applied with a bicycle-wheel plot sprayer delivering 17 gpa at 35 psi and harrow incorporated twice April 16. The soil was dry to a depth of 2 inch and rainfall for a 2 week period following application totaled 0.4inch. The experiment was a randomized complete block with 4 replications. Experimental units were 8 by 32 ft. Wild oat ratings were on July 2, other weed control and crop injury ratings were on July12. Weed densities were moderate to light.

Treatment	Rate	----Wheat----			Barley		--Percent		Control--		
	lb/A	Yield bu/A	%ir	%sr	%ir	%sr	Wimu	Fxtl	Kocz	Wibw	Wioa
Triallate	1	34.7	0	0	0	0	0	0	0	0	74
Triallate+Trifluralin	1+.75	38.6	0	3	0	1	0	97	75	14	81
Triallate+Profluralin	1+.75	37.0	1	1	0	0	0	95	72	0	78
Triallate+Fluchloralin	1+.75	34.0	0	3	0	3	0	96	80	14	68
Triallate+Pendimethalin	1+1	37.8	0	3	0	1	0	95	53	28	88
Triallate+Pendimethalin	1+1.5	38.6	0	1	0	3	0	97	70	15	81
Triallate+SSH-0860	1+1	35.2	0	3	0	1	68	76	37	0	76
Triallate+SSH-0860	1+1.5	37.3	0	4	3	3	75	79	33	24	82
Triallate+R-40244	1+.25	35.5	0	0	0	3	20	10	20	0	80
Triallate+R-40244	1+.5	42.8	0	1	0	3	44	26	62	8	84
Triallate+MC-10108	1+.5	38.5	1	0	1	0	60	59	67	33	77
Triallate+Chloramben	1+1.5	38.9	0	3	0	6	64	91	82	18	71
Triallate+DPX-4189	1+.015	39.6	0	3	0	3	56	83	87	14	77
Triallate+DPX-4189	1+.03	43.2	3	4	0	3	76	90	78	16	82
Triallate+DPX-4189	1+.06	42.4	0	4	0	5	85	95	87	16	80
Triallate+Trif+DPX-4189	1+.75+.03	36.3	1	4	3	4	76	100	75	40	79
Triallate+Trif+R-40244	1+.75+.5	35.0	1	1	0	0	74	97	75	31	78
Triallate+Trif+MC10108	1+.75+.5	37.6	0	9	0	6	75	99	88	40	81
SSH-0860	1	30.3	0	0	0	0	66	76	35	5	45
SSH-0860	1.5	29.8	0	0	0	4	79	73	70	23	34
SSH-0860+Trifluralin	1+0.5	31.7	0	0	0	0	56	97	47	28	55
SSH-0860+Trifluralin	1+0.75	37.9	0	0	3	0	81	99	77	36	62
Control		15.6	0	0	0	0	0	0	0	0	0
Mean		36.0	0	2	0	2	46	75	59	17	70
High mean		43.2	3	9	3	6	85	100	88	40	88
Low mean		15.6	0	0	0	0	0	0	0	0	0
Coeff. of variation		18.5	433	171	486	172	36	11	34	89	23
LSD(1 Percent)		12.3	3	6	3	6	30	15	44	29	30
LSD(5 Percent)		9.3	2	5	3	5	23	11	33	22	23
No. of reps		4.0	4	4	4	4	4	4	3	4	4

Summary

Herbicide treatments increased wheat yields 18 to 22 bu/A compared to the untreated control. Wild oat control with triallate was not influenced by any herbicide combination. Chloramben or chlorsulfuron combinations with triallate provided fair to good control of wild mustard, green foxtail, and kochia; dinitroanaline combinations, excellent green foxtail control and fair kochia control; and SSH-0860 combinations fair wild mustard and green foxtail control.

SSH-0860 in wheat and barley, Fargo 1981. Preplant (PPI) treatments were applied and incorporated twice with field cultivator, Era wheat and Park barley seeded, preemergence incorporated (PEI) treatments applied and harrowed twice, and preemergence (PE) treatments applied April15. The soil was dry to a depth of 2 inch and rainfall for a 2 week period following application totalled 0.4 inch. All treatments were applied with a bicycle wheel sprayer delivering 17 gpa at 35 psi. The experiment was a randomized complete block with four replications. Wild oat and crop injury ratings were on July 10. Wild oat density was 20 plants/ft square.

Treatment		Rate lb/A	----Wheat--- %ir	%sr	---Barley--- %ir	%sr	--% Control-- Wioa	Wimu
Triallate	PPI	1	0	0	0	0	92	0
SSH-0860	PPI	1	0	0	0	0	21	85
SSH-0860	PPI	1.5	0	0	0	0	41	94
SSH-0860	PPI	2	0	0	0	0	44	100
Triallate	PEI	1	0	0	0	0	46	0
SSH-0860	PEI	1	0	0	0	0	16	81
SSH-0860	PEI	1.5	0	0	0	0	26	94
SSH-0860	PEI	2	0	0	0	0	36	97
Triallate	PE	1	0	0	0	0	13	0
SSH-0860	PE	1	0	0	0	0	8	64
SSH-0860	PE	1.5	0	0	0	0	8	90
SSH-0860	PE	2	0	0	0	0	25	99
Control			0	0	0	0	0	0
Mean			0	0	0	0	29	62
High mean			0	0	0	0	92	100
Low mean			0	0	0	0	0	0
Coeff. of variation			0	0	0	0	55	18
LSD(1 Percent)			0	0	0	0	31	21
LSD(5 Percent)			0	0	0	0	23	15
No. of reps			4	4	4	4	4	4

Summary

PPI application of triallate was the only treatment which effectively controlled wild oat. Wild mustard control was good with SSH-0860 at 1 to 2 lb/A PPI or PEI and 1.5 to 2 lb/A PE.

New preemergence herbicides for wild oat control, Fargo 1981. Era wheat and Park barley were seeded, incorporated (PEI) treatments applied and harrowed twice, and surface (PE) treatments applied April 15. The soil was dry to a depth of 2 inch and rainfall for a 2 week period following application totalled 0.4 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. Weed control and crop injury ratings were on July 2. Wild oat density was 20 plants/ft square.

Treatment		Rate lb/A	--Wheat-- %ir	%sr	--Barley- %ir	%sr	---Percent Wimu	Fxtl	control--- Wibw	Wioa
Triallate	PEI	1	0	3	0	0	0	0	0	60
Triallate+bivert	PEI	1+.25G	0	5	0	0	0	0	0	48
SD-92818	PEI	0.5	0	0	0	1	0	71	0	3
SD-92818	PEI	1	0	0	1	0	0	87	0	3
SD-92818	PEI	2	0	1	0	0	0	90	0	11
SD-96803	PEI	0.5	0	0	1	0	0	74	0	9
SD-96803	PEI	1	3	1	3	3	0	81	0	19
SD-96803	PEI	2	1	0	4	3	0	93	0	26
SD-95481	PEI	0.5	0	0	1	1	0	83	0	13
SD-95481	PEI	1	1	0	1	1	0	99	0	19
SD-95481	PEI	2	6	6	6	3	50	100	0	40
SD-49818	PEI	1	0	0	0	0	0	88	0	14
SD-92818	PE	0.75	0	0	0	0	0	60	0	0
SD-92818	PE	1.5	3	0	4	0	0	86	0	0
SD-92818	PE	3	0	0	0	0	0	85	0	3
SD-96803	PE	0.75	0	0	0	0	0	61	0	9
SD-96803	PE	1.5	0	0	0	0	0	79	0	6
SD-96803	PE	3	0	0	0	0	0	80	0	10
SD-95481	PE	1	0	0	0	0	0	83	0	10
SD-95481	PE	1.5	0	0	0	0	0	85	0	6
SD-95481	PE	3	3	1	1	1	0	91	0	36
SD-49818	PE	1.5	0	0	0	0	0	71	0	4
Control			0	0	0	0	0	0	0	0
Mean			1	1	1	1	2	72	0	15
High mean			6	6	6	3	50	100	0	60
Low mean			0	0	0	0	0	0	0	0
Coeff. of variation			266	276	206	349	0	19	0	93
LSD(1 Percent)			3	4	4	4	0	25	0	26
LSD(5 Percent)			3	3	3	3	0	19	0	20
No. of reps			4	4	4	4	1	4	1	4

Summary

No treatment controlled wild oat as effectively as triallate. Foxtail control with the SD compounds was slightly better when incorporated than surface applied. SD-95481 was more effective on foxtail than the other compounds tested. Little crop injury was observed with any treatment.

Barban formulation comparison, Fargo 1981. Era wheat was seeded April 30 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-lf wheat and wild oat May 22. Rainfall for a 1 week period following application totalled 3.3 inch. Herbicides were applied with a bicycle wheel sprayer delivering 4.5 gpa at 45 psi. The experiment was a randomized complete block with 4 replications. Weed control and injury ratings were on July 17. Wild oat density was 20 plants/ft square.

Treatment	Rate lb/A	-------Wheat------ %ir	%sr	% Control Wioa
Barban (2lb/Gallon)	4	0	0	73
Barban (2lb/Gallon)	6	0	0	73
Barban (2lb/Gallon)	8	1	0	77
Barban (2lb/Gallon)+N	6+1G	0	0	74
Barban (1lb/Gallon)	4	0	0	75
Barban (1lb/Gallon)	6	1	0	79
Barban (1lb/Gallon)	8	4	0	83
Barban (1lb/Gallon)+N	6+1G	0	0	81
Control		0	0	0
Mean		1	0	68
High mean		4	0	83
Low mean		0	0	0
Coeff. of variation		275	0	11
LSD(1 Percent)		4	0	14
LSD(5 Percent)		3	0	11
No. of reps		4	4	4

Summary

Wild oat control with barban was similar regardless of formulation.

Broadleaf herbicide combinations with barban, Fargo 1981. Era wheat was seeded May 5 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat May 22 except propanil applications before or after barban were May 18, 20, 26 and 28. Rainfall for a 1 week period following application was 3.3 inch. Herbicides were applied with a bicycle wheel sprayer delivering 4.5 gpa at 45 psi. The experiment was a randomized complete block with 4 replications. Weed control and injury ratings were on July 17. Wild oat density was 10 plants/ft square.

Treatment	Rate oz/A	----Wheat---- %ir	%sr	--% Control-- Wioa	Wimu
Barban	6	0	0	60	0
Barban+Chlorsulfuron	6+0.25	0	0	72	100
Barban+Chlorsulfuron	6+0.5	4	0	78	100
Barban+Chlorsulfuron	6+1	0	0	60	100
Barban+R-40244	6+2	4	0	72	100
Barban+R-40244	6+4	0	0	65	100
Barban+Acifluorfen	6+6	0	0	54	90
Barban+Mefluidide	6+0.5	3	0	71	80
Barban+Propanil	6+24	0	0	55	100
Barban+Propanil 4daybefore	6+24	3	0	74	0
Barban+Propanil 2daybefore	6+24	0	0	78	100
Barban+Propanil 2dayafter	6+24	10	0	71	100
Barban+Propanil 4dayafter	6+24	7	0	78	100
Barban+RH-043-E	6+4	0	0	65	95
Control		0	0	0	0
Mean		2	0	63	78
High mean		10	0	78	100
Low mean		0	0	0	0
Coeff. of variation		129	0	14	0
LSD(1 Percent)		5	0	17	0
LSD(5 Percent)		4	0	13	0
No. of reps		4	4	4	1

Summary

Wild oat control with 6 oz/A barban was not reduced by the addition of other herbicides. Further chlorsulfuron, R-40244, mefluidide and split applications of propanil increased wild oat control with barban slightly.

Broadleaf herbicide combinations with diclofop, Fargo 1981. Era wheat was seeded April 15 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat May 12. Both wheat and wild oat were under stress when applications were made. First rain was 3.3 inch which fell over a 3 day period of May 22-24. 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. Weed control and injury ratings were on July 6. Wild oat density was 20 plants/ft square.

Treatment	Rate oz/A	Wheat %ir	------Percent Kocz	control------ Wimu	Wioa
Diclofop	8	0	0	0	65
Diclofop	12	0	0	0	78
Diclofop+DPX-5648	8+0.25	0	95	99	65
Diclofop+DPX-5648	12+0.25	29	100	98	85
Diclofop+DPX-5648	12+0.5	38	100	100	95
Diclofop+Chlorsulfuron	12+1	0	95	98	66
Diclofop+R-40244	12+2	0	85	90	59
Diclofop+R-40244	12+4	1	90	94	86
Diclofop+Acifluorfen	12+6	0	88	100	65
Diclofop+Mefluidide	12+0.5	0	0	0	83
Diclofop+Bromoxynil	12+4	0	88	81	90
Diclofop+RH-043	12+4	0	95	90	70
Control		0	0	0	0
Mean		5	64	65	70
High mean		38	100	100	95
Low mean		0	0	0	0
Coeff. of variation		54	7	6	10
LSD(1 Percent)		5	15	7	14
LSD(5 Percent)		4	10	5	10
No. of reps		4	2	4	4

Summary

Wild oat control with diclofop was increased slightly by the addition of DPX-5648 or bromoxynil and reduced slightly by the addition of chlorsulfuron, R-40244, acifluorfen or RH-043. Wheat was injured by diclofop combinations with DPX-5648.

Broadleaf herbicide combinations with difenzoquat, Fargo 1981. Era wheat was seeded April 30 in 6 inch row spacings. Herbicide applications were made to 3.5 to 4-leaf wheat and wild oat June5 except propanil applications before difenzoquat were on June 1 and 3. Rainfall for a 1 week period following application was 0.9 inch. 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. Weed control and injury ratings were on July 17. Wild oat density was 20 plants/ft square.

Treatment	Rate oz/A	---Wheat-- %ir	%sr	-Percent Wioa	Wimu	control- Fxtl
Difenzoquat	12	3	0	84	0	0
Difenzoquat+2,4-D ES	12+4	9	0	86	100	0
Difenzoquat+2,4-D AM	12+4	8	0	83	100	0
Difenzoquat+R-40244	12+2	8	1	86	100	0
Difenzoquat+R-40244	12+4	4	3	90	100	0
Difenzoquat+Chlorsulfuron	12+0.25	1	0	82	100	100
Difenzoquat+Chlorsulfuron	12+.05	10	0	82	100	99
Difenzoquat+Chlorsulfuron	12+1	9	0	81	100	100
Difenzoquat+Propanil	12+24	0	0	38	96	88
Difenzoquat+Propanil 2daybefore	12+24	1	0	68	95	77
Difenzoquat+Propanil 4daybefore	12+24	8	0	91	100	83
Control		0	0	0	0	0
Mean		5	0	72	83	46
High mean		10	3	91	100	100
Low mean		0	0	0	0	0
Coeff. of variation		88	343	15	3	15
LSD(1 Percent)		8	2	21	5	13
LSD(5 Percent)		6	2	16	4	10
No. of reps		4	4	4	4	4

Summary

Wild oat control with difenzoquat was not influenced by the addition of 2,4-D amine or ester, R-40244 and chlorsulfuron. Wild oat control with difenzoquat was reduced over 40% by the addition of propanil. Further a 2 day separation between application of propanil and difenzoquat did not overcome the antagonism.

Hard red spring wheat response to difenzoquat, Minot 1981. Hard red spring wheat cultivars were seeded May 5. Difenzoquat was applied at 1 lb/A to 3 to 5-leaf wheat June 8 with a tractor mounted sprayer delivering 20 gpa at 30 psi. The wheat had previously been treated with 3 lb/A propachlor on May 8 and 6+6 oz/A of bromoxynil+MCPA on June 8. Injury data is based on two observations and yield on a 9 sq ft hand harvested sample.

	------% Injury------			----------Yield--------	
Cultivar	June 24	July 22	Mat Delay Days	Untreated bu/A	red trt %
Baapt	1	15	2	40	0
Thatcher	60	30	9	51	46
Lew	70	60	13	44	31
Waldron	70	60	14	46	39
Coteau	30	10	7	47	13
Alex	70	45	9	47	35
Benito	10	0	4	41	0
James	20	15	6	48	0
Butte	10	10	2	48	0
Olaf	50	10	6	53	28
Len	70	65	9	45	35
Solar	30	15	3	60	15
Walera	15	5	2	61	16
Prolorund 711	10	15	2	42	5
Era	20	10	2	56	22
Wared	30	15	5	55	19
Prodax	15	0	2	42	3
906 R	90	70	15	51	43
Aim	90	55	9	60	42
Oslo	20	15	5	53	17
Tracey	10	5	4	46	6
Pondera	20	5	1	36	1
Marberg	5	0	5	47	2
Probrand 715	30	10	4	52	7
Pioneer X7618	80	60	13	48	24
Pioneer 2360	40	25	3	48	19
MN70170R	30	0	3	59	16
ND573	15	5	3	47	0
ND574	30	40	8	51	18
ND575	20	10	5	52	18
ND580	80	70	11	49	46
ND581	80	70	11	51	51
ND582	20	5	7	33	0
ND583	50	10	6	36	1
ND584	15	0	3	33	0
ND585	30	5	5	26	0
ND586	20	5	8	32	0
MP180	25	10	2	52	17

Summary

Hard red spring wheat cultivars exhibited marked differences in tolerance to 1 lb/A difenzoquat. Wheat cultivar injury ratings on July 22 ranged from 0 to 70% and yield reductions from 0 to 51%.

Durum wheat response to difenzoquat, Minot 1981. Durum wheat cultivars were seeded May 5, 1981. Difenzoquat was applied at 1 lb/A to 3 to 5 leaf wheat June 8 with a tractor mounted sprayer delivering 20 gpa at 30psi. The wheat had previously been treated with 3 lb/A propachlor on May 8 and 6+6 oz/A of bromoxynil+MCPA on June 8. Injury data is based on two observations and yield on a 9 sq ft hand harvested sample.

Cultivar	------% Injury------ June 24	July 22	Mat Delay Days	---------Yield-------- Untreated bu/A	red trt %
Vic	30	15	2	44	26
Ward	5	0	0	43	1
Rugby	1	0	0	47	0
Crosby	1	0	0	52	14
Coulter	5	5	2	58	30
Rolette	5	0	1	44	2
Botno	1	10	0	48	17
Edmore	50	20	0	52	26
Cando	1	0	0	51	19
Calvin	1	0	1	42	34
D771	1	0	3	53	12
D773	60	45	9	56	27
D7609	52	20	6	45	13
D7615	5	0	2	49	12
D782	5	0	2	39	0
D785	1	0	0	50	0
D7732	5	0	0	43	0
D7733	70	45	8	45	12
D7751	50	45	5	44	20
D7798	60	40	9	52	29
D77189	5	0	6	42	0
D77197	5	0	4	42	0
D77200	5	0	3	46	0
D77204	1	0	2	47	2
D791	50	50	10	42	42
D792	40	55	9	53	33
D793	5	0	0	55	2
D794	40	45	11	52	50

Summary

Durum wheat cultivars exhibited marked differences in tolerance to 1 lb/A difenzoquat. Durum cultivar injury ratings on July 22 ranged from 0 to 55% and yield reductions from 0 to 50%. Durum cultivars with Edmore parentage were generally more susceptible to difenzoquat than the other cultivars tested.

SD-45328 for wild oat control, Fargo. Era wheat and Beacon barley were seeded April 24 in 6 in row spacings. Herbicides applications were made to 1.5 to 2-leaf crop and wild oat May 14 and 3.5 to 4-leaf crop and wild oat May 28. Both wild oat an crop were growing under moisture stress when applications were made at the 1.5 to 2-leaf stage. First rain after application was 3.3 inch over a 3 day period May 22 to 24. In addition 0.3 inch rain fell within 3 days after application at the 3.5 to 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. Experimental units were 8 by 32ft. Wild oats and crop injury ratings were on July 17. Wild oat density was 30 plants/ft sq.

Treatment	Rate oz/A	------Wheat------ Yield bu/A	%ir	%sr	--Barley- %ir	%sr	%Cont Wioa
Diclofop 2-lf	0.75	39.8	0	0	0	0	85
SD-45328 2-lf	0.15	40.9	0	0	0	0	89
SD-45328 2-lf	0.18	40.7	0	0	0	0	93
SD-45328 2-lf	0.21	43.3	0	0	1	0	93
SD-45328 2-lf	0.25	44.5	0	0	1	0	98
SD-45328+Nitrogen 2-lf	0.18+1G	39.7	0	0	0	0	94
SD-45328+OC 2-lf	0.18+.25G	45.8	0	0	3	0	98
Flamprop 2-lf	0.5	45.3	0	0	1	0	96
Difenzoquat 4-lf	0.75	42.7	3	0	4	0	98
SD-45328 4-lf	0.15	45.2	4	0	3	0	99
SD-45328 4-lf	0.18	44.6	4	0	4	0	99
SD-45328 4-lf	0.21	42.3	1	0	4	0	100
SD-45328 4-lf	0.25	44.3	1	0	8	0	100
SD-45328+Nitrogen 4-lf	0.18+1G	42.9	2	0	5	0	100
SD-45328+OC 4-lf	0.18+.25G	41.7	1	0	4	0	99
Flamprop 4-lf	0.5	43.1	1	0	5	0	99
Control		26.2	0	0	0	0	0
Mean		41.9	1	0	2	0	90
High mean		45.8	4	0	8	0	100
Low mean		26.2	0	0	0	0	0
Coeff. of variation		10.5	237	0	119	0	3
LSD(1 Percent)		8.3	4	0	6	0	5
LSD(5 Percent)		6.2	3	0	4	0	3
No. of reps		4.0	4	4	4	4	4

Summary

Slight crop injury was observed with 4-leaf treatments; however, no treatment reduced crop stand. Wild oat control with SD-45328 at 0.18 lb/A was slightly better than with diclofop at 0.75 lb/A and similar to flamprop at 0.5 lb/A or difenzoquat at 0.75 lb/A. Wild oat control with SD-45328 was slightly better at the 4 than 2-leaf stage. Wheat yields were 14 to 20 bu/A higher in herbicide treated than control plots thus reflecting the excellent wild oat control obtained.

SD-45328 for wild oat control in wheat, Minot 1981. Coteau wheat was seeded April 10 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat May 6 and to 3.5 to 4-leaf wheat and wild oat May 19. Rainfall for a 1 week period following application at the 1.5 to 2-lf and 3.5 to 4-leaf stage was 0.1 and 0.7 inch, respectively. Herbicides were applied with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The expiment was a randomized complete block with 4 replications. Experimental units were 8 by 16ft. Wild oat control and crop injury ratings were on July 8. Wild oat density was 30 plants/ft square.

Treatment	Rate lb/A	--------Wheat------- Yield bu/A	%ir	% Cont Wioa
Diclofop 2-lf	0.75	16.0	0	80
SD-45328 2-lf	0.15	12.9	0	67
SD-45328 2-lf	0.18	13.1	0	65
SD-45328 2-lf	0.21	13.1	0	73
SD-45328 2-lf	0.25	13.9	0	80
SD-45328+Nitrogen 2-lf	0.18+1G	13.9	0	75
SD-45328+OC 2-lf	0.18+.25G	13.6	0	73
Flamprop 2-lf	0.5	13.0	0	64
Difenzoquat 4-lf	0.75	13.0	0	73
SD-45328 4-lf	0.15	15.0	0	79
SD-45328 4-lf	0.18	13.8	0	76
SD-45328 4-lf	0.21	15.2	0	87
SD-45328 4-lf	0.25	16.4	0	88
SD-45328+Nitrogen 4-lf	0.18+1G	16.4	1	88
SD-45328+OC 4-lf	0.18+.25G	17.3	3	93
Flamprop 4-lf	0.5	18.4	0	94
Control		8.7	0	0
Mean		14.3	0	74
High mean		18.4	3	94
Low mean		8.7	0	0
Coeff. of variation		19.2	599	12
LSD(1 Percent)		5.2	2	17
LSD(5 Percent)		3.9	2	13
No. of reps		4.0	4	4

Summary

Wild oat control with SD-45328 increased as rate increased and was better at the 4 than 2-leaf stage. Wheat yields were 4 to 10 bu/A higher in treated than control plots.

SD-45328 for wild oat control in wheat, Williston 1981. Len wheat was seeded April 10 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat on May 7 and to 3.5 to 4-leaf wheat and wild oat on May 20. Herbicides were applied with a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications. Experimental units were 8 by 25 ft. Wild oat control and wheat injury ratings were on July 9. Wild oat density was 8 plants/sq. ft.

Treatment	Rate lb/A	---------------Wheat--------------- Yield bu/A	Twt lb/bu	%ir	Height (cm)	% Cont Wioa
Diclofop 2-lf	0.75	19.7	51.8	0	80	82
SD-45328 2-lf	0.15	17.0	51.4	0	83	60
SD-45328 2-lf	0.18	14.5	48.4	0	80	73
SD-45328 2-lf	0.21	21.9	53.4	0	82	72
SD-45328 2-lf	0.25	15.6	52.2	0	73	79
SD-45328+Nitrogen 2-lf	0.18+1G	21.1	53.1	0	73	75
SD-45328+OC 2-lf	0.18+.25G	22.5	52.8	1	72	82
Flamprop 2-lf	0.5	19.7	51.1	0	78	71
Difenzoquat 4-lf	0.75	23.9	53.9	0	75	84
SD-45328 4-lf	0.15	22.6	52.6	0	69	83
SD-45328 4-lf	0.18	28.1	54.6	0	79	87
SD-45328 4-lf	0.21	19.1	51.0	0	74	93
SD-45328 4-lf	0.25	23.1	56.1	0	77	96
SD-45328+Nitrogen 4-lf	0.18+1G	19.3	52.5	1	70	96
SD-45328+OC 4-lf	0.18+.25G	19.9	51.4	0	75	97
Flamprop 4-lf	0.5	22.3	52.7	1	59	95
Control		19.4	55.8	0	80	0
Mean		20.6	52.6	0	75	78
High mean		28.1	56.1	1	83	97
Low mean		14.5	48.4	0	59	0
Coeff. of variation		29.7	0.	473	7	6
LSD(1 Percent)		11.5	0.	2	15	8
LSD(5 Percent)		8.6	0.	1	11	6
No. of reps		4.0	1.0	4	2	4

Summary

Little wheat injury was observed with any treatment. Wild oat control with SD-45328 was better at the 4 than 2leaf stage and was increased by the addition of nitrogen or petroleum oil concentrate.

SD-45328 for wild oat control in barley, Fargo. Park barley was seeded May 14 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf barley and wild oat June8 and 3.5 to 4-leaf barley and wild oat June 16. Rainfall for a 1 week period following application at the 1.5 to 2 and 3.5 to 4-leaf stage was 0.9 and 0.6inch; respectively. Herbicides were applied with a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications. Experimental units were 8 by 24 ft. Wild oat and barley injury ratings were on July 17. Wild oat density was 2 plants/ft sq.

Treatment	Rate lb/A	-------Barley-------- Yield bu/A	%ir	%sr	%Cont Wioa
Diclofop 2-lf	0.75	55.3	9	0	89
SD-45328 2-lf	0.15	53.5	0	0	80
SD-45328 2-lf	0.18	57.7	9	0	83
SD-45328 2-lf	0.21	61.8	7	0	92
SD-45328 2-lf	0.25	58.4	3	0	98
SD-45328+Nitrogen 2-lf	0.18+1G	61.3	8	0	91
SD-45328+OC 2-lf	0.18+.25G	57.2	6	0	95
Flamprop 2-lf	0.5	60.8	4	0	98
Difenzoquat 4-lf	0.75	58.8	6	0	96
SD-45328 4-lf	0.15	54.1	15	0	90
SD-45328 4-lf	0.18	50.4	18	0	97
SD-45328 4-lf	0.21	48.6	20	0	98
SD-45328 4-lf	0.25	41.6	34	0	100
SD-45328+Nitrogen 4-lf	0.18+1G	50.5	23	0	96
SD-45328+OC 4-lf	0.18+.25G	47.8	31	0	98
Flamprop 4-lf	0.5	48.4	25	0	100
Control	0	56.7	0	0	0
Mean		54.3	13	0	88
High mean		61.8	34	0	100
Low mean		41.6	0	0	0
Coeff. of variation		8.1	44	0	9
LSD(1 Percent)		9.8	11	0	15
LSD(5 Percent)		7.3	8	0	12
No. of reps		3.0	4	4	4

Summary

Wild oat control with SD-45328 was generally better at the 4 than 2-leaf stage of application. Wild oat control with SD-45328 was similar with 0.15 lb/A at the 4-leaf stage or 0.21 lb/A at the 2-leaf stage. SD-45328 at rates of 0.18 lb/A or above significantly reduced barley yields at the 4 but not the 2-leaf stage.

SD-45328 formulation comparison, Fargo. Era wheat and Park barley were seeded April 15 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf crop and wild oat May 12 and 3.5 to 4-lf crop and wild oat May 28. Both wild oat and crop were growing under moisture stress when applications were made at the 1.5 to 2-leaf stage. First rain after application was 3.3 inch over a 3day period May 22 to 24. In addition 0.3 inch rain fell within 3 days after application at the 3.5 to 4-lf stage. Herbicides were applied with a bicycle-wheel plot sprayer delivering 8.5 gpa at 35 psi. The experiment was a randomized complete block with 4 replications. Experimental units were 8 by 32 ft. Wild oat and crop injury rating were on July 2. Wild oat density was 10 plants/ft square.

Treatment	Rate lb/A	----Wheat--- %ir	%sr	---Barley--- %ir	%sr	%Cont Wioa
SD-45328-.62 2-lf	.15	0	0	0	0	60
SD-45328-.62 2-lf	.18	0	0	0	0	66
SD-45328-.62 2-lf	.21	0	0	0	0	86
SD-45328-.42 2-lf	.12	0	0	0	0	66
SD-45328-.42 2-lf	.15	0	0	0	0	86
SD-45328-.42 2-lf	.18	1	0	0	0	90
SD-45328-.62 4-lf	.15	1	0	6	0	80
SD-45328-.62 4-lf	.18	0	0	5	0	92
SD-45328-.62 4-lf	.21	0	0	1	0	88
SD-45328-.42 4-lf	.12	4	0	8	0	82
SD-45328-.42 4-lf	.15	0	0	4	0	78
SD-45328-.42 4-lf	.18	0	0	8	0	97
Control		0	0	0	0	0
Mean		0	0	2	0	75
High mean		4	0	8	0	97
Low mean		0	0	0	0	0
Coeff. of variation		348	0	163	0	19
LSD(1 Percent)		3	0	8	0	27
LSD(5 Percent)		2	0	6	0	20
No. of reps		4	4	4	4	4

Summary

Wild oat control was generally better with the 0.42 than 0.62 lb/gal formulation of SD-45328 at both stages of application. Little crop injury was observed at the 2-leaf stage; however, slight crop injury was observed with all treatments at the 4-leaf stage.

SD-45328 formulation comparison in wheat, Minot 1981. Coteau wheat was seeded April 10 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf wheat and wild oat May 6 and 3.5 to 4-leaf wheat and wild oat May 19. Rainfall for a 1 week period following application at the 1.5 to 2-leaf and 3.5 to 4-leaf stage was 0.1 and 0.7 inch, respectively. 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. Experimental units were 8 by 16 ft. Wild oat control and crop injury ratings were on July 8. Wild oat density was 30 plants/ft square.

Treatment		Rate lb/A	--------Wheat-------- Yield bu/A	%ir	% Cont Wioa
SD-45328-.62	2-lf	.15	12.0	0	55
SD-45328-.62	2-lf	.18	13.4	0	66
SD-45328-.62	2-lf	.21	14.3	0	61
SD-45328-.42	2-lf	.12	11.1	0	63
SD-45328-.42	2-lf	.15	13.1	0	68
SD-45328-.42	2-lf	.18	14.4	0	76
SD-45328-.62	4-lf	.15	15.2	0	73
SD-45328-.62	4-lf	.18	15.5	0	80
SD-45328-.62	4-lf	.21	15.6	0	81
SD-45328-.42	4-lf	.12	14.4	0	74
SD-45328-.42	4-lf	.15	15.2	0	86
SD-45328-.42	4-lf	.18	14.4	0	89
Control			8.3	0	0
Mean			13.6	0	67
High mean			15.6	0	89
Low mean			8.3	0	0
Coeff. of variation			16.3	0	14
LSD(1 Percent)			4.2	0	18
LSD(5 Percent)			3.2	0	14
No. of reps			4.0	4	4

Summary

Wild oat control tended to be better with the 0.42 than 0.62 lb/gal formulation at both stages of application. Wheat yields generally reflected wild oat control.

SD-45328 formulations and additives, Fargo 1981. Era wheat and Beacon barley were seeded April 24 in 6 inch row spacings. Herbicide applications were made to 3.5 to 4-leaf wheat, barley and wild oat May 28. Rainfall for a 1 week period following application totalled 0.5inch with 0.3 inch within 3 days. 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. Weed control and injury ratings were on July 17. Wild oat density was 30 plants/ft square.

Treatment	Rate lb/A	--------Wheat-------- Yield bu/A	%ir	%sr	---Barley-- %ir	%sr	% Cont Wioa
SD-45328	.15	36.4	1	0	3	0	93
SD-45328	.18	41.4	0	0	7	0	97
SD-45328	.21	43.5	1	0	9	0	98
SD-45328 (.42)	.12	40.3	0	0	0	0	89
SD-45328 (.42)	.15	42.2	2	0	3	0	95
SD-45328 (.42)	.18	45.3	1	0	3	0	98
SD-45328+X-77	.18+5%	41.6	1	0	7	0	97
SD-45328+WK	.18+5%	39.2	3	0	4	0	98
SD-45328+Citowett	.18+5%	39.9	3	0	3	0	94
SD-45328+Bivert	.18+1qt	44.7	1	0	3	0	95
SD-45328+LOTM	.18+1qt	44.0	2	0	5	0	95
SD-45328+OC	.18+1qt	41.1	3	0	3	0	97
SD-45328+Herbex	.18+1qt	40.0	0	0	6	0	98
Control		18.9	0	0	0	0	0
Mean		39.9	1	0	4	0	89
High mean		45.3	3	0	9	0	98
Low mean		18.9	0	0	0	0	0
Coeff. of variation		12.9	211	0	105	0	3
LSD(1 Percent)		9.8	5	0	8	0	5
LSD(5 Percent)		7.4	4	0	6	0	4
No. of reps		4.0	4	4	4	4	4

Summary

Little crop injury was observed with any treatment. Wild oat control was excellent with all treatments ranging from 89 to 98%. Wheat yields were 17 to 26 bu/A higher in treated than control plots.

Broadleaf combinations with SD-45328, Fargo 1981. Era wheat was seeded April 30 in 6 inch row spacings. Herbicide applications were made to 3.5 to 4-leaf wheat and wild oat June 5 except propanil applications before SD-45-328 were on June 1 and 3. Rainfall for a 1 week period following application was 0.9 inch. 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. Weed control and injury ratings were on July 17. Wild oat density was 30 plants/ft square.

Treatment	Rate oz/A	---Wheat--- %ir	---Wheat--- %sr	--Percent control-- Wioa	--Percent control-- Wimu	--Percent control-- Fxtl
SD45328	2	0	0	77	0	0
SD45328	4	11	0	98	0	0
SD45328+Chlorsulfuron	4+0.25	9	0	87	100	100
SD45328+Chlorsulfuron	4+0.5	4	0	75	100	100
SD45328+Chlorsulfuron	4+1	13	0	83	100	100
SD45328+R-40244	4+2	4	3	82	100	0
SD45328+R-40244	4+4	9	1	87	100	8
SD45328+Metribuzin-W	4+4	3	6	58	100	38
SD45328+MSMA	2+24	8	0	85	100	68
SD45328+MSMA	2+32	6	0	80	100	81
SD45328+MSMA	4+24	8	0	86	100	44
SD45328+MSMA	4+32	14	0	91	100	81
SD45328+Propanil	4+24	1	0	36	86	83
SD45328+Propanil 2daybefore	4+24	0	0	55	98	75
SD45328+Propanil 4daybefore	4+24	6	0	88	93	78
SD45328+RH-043-E	4+4	1	0	46	75	13
MSMA	32	5	0	72	99	79
Control		0	0	0	0	0
Mean		6	1	71	81	52
High mean		14	6	98	100	100
Low mean		0	0	0	0	0
Coeff. of variation		74	301	17	13	38
LSD(1 Percent)		8	3	23	20	37
LSD(5 Percent)		6	2	17	15	28
No. of reps		4	4	4	4	4

Summary

Wild oat control with SD-45328 was not influenced by the addition of MSMA, reduced 10 to 20% by the addition of chlorsulfuron or R-40244 and reduced over 40% by the addition of propanil, metribuzin or RH-043. A 2 day separation between application of propanil and SD45328 did not overcome the antagonism.

Broadleaf combinations with SD-45328, Minot 1981. Coteau wheat was seeded April 10 in 6 inch row spacings. Herbicide applications were made to 3.5 to 4-leaf wheat and wild oat May 19. Rainfall for a 1 week period following application totalled 0.7 inch. 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. Experimental units were 8 by 16 ft. Wild oat control and crop injury ratings were on July 8. Wild oat density was 30 plants/ft square.

Treatment		Rate oz/A	-------Wheat------ Yield bu/A	%ir	% Cont Wioa
SD-45328		2	11.1	0	63
SD-45328		4	12.6	3	88
SD-45328+Chlorsulfuron		4+0.25	13.2	0	80
SD-45328+Chlorsulfuron		4+0.5	12.0	1	84
SD-45328+Chlorsulfuron		4+1	12.9	1	83
SD-45328+R-40244		4+2	13.6	0	84
SD-45328+R-40244		4+4	13.9	0	85
SD-45328+Metribuzin-W		4+4	12.8	1	77
SD-45328+MSMA		2+24	12.8	0	81
SD-45328+MSMA		2+32	11.5	6	90
SD-45328+MSMA		4+24	15.3	3	91
SD-45328+MSMA		4+32	17.4	4	93
SD-45328+Propanil		4+24	12.6	0	66
SD-45328+Propanil	split	4+24	14.0	0	73
SD-45328+Propanil	1daybefore	4+24	12.9	0	66
SD-45328+RH-043-E		4+4	11.2	0	68
MSMA		32	11.5	3	74
Control			7.5	0	0
Mean			12.7	1	75
High mean			17.4	6	93
Low mean			7.5	0	0
Coeff. of variation			19.7	212	11
LSD(1 Percent)			4.7	5	15
LSD(5 Percent)			3.5	4	11
No. of reps			4.0	4	4

Summary

Wild oat control with SD-45328 was not influenced by the addition of chlorsulfuron, R40244 and MSMA but reduced by the addition of propanil, metribuzin or RH-043. A 1 day separation between application of propanil and SD-45328 did not overcome the antagonism.

Barley response to SD-45328, Fargo. An experiment was conducted on silty clay soil with pH 7.5 and 6% organic matter to evaluate barley cultivar response to SD-45328. Barley cultivars were seeded April 17 in 6 inch row spacings. Treatments were applied in 8.5 gpa at 35 psi to 4.5 to 5leaf barley on June 4. Rainfall for a two week period following application totaled 1.25 inch. The experiment was a randomized complete block with a split-block arrangment and 3 replications.

	Treatment				
Cultivar	SD-45328 5-lf 0.12 lb/A	SD-45328 5-lf 0.25 lb/A	SD-45328 5-lf 0.5 lb/A	Control	Mean
Larker	43	40	33	47	41
Glenn	32	33	22	42	32
Bonanza	35	33	18	46	33
Hector	34	31	18	42	31
Park	46	44	29	43	41
Vanguard	31	28	23	32	29
Manker	37	33	19	44	33
Beacon	36	26	14	49	31
Bumper	53	42	25	50	43
Morex	45	35	20	47	37
Mean	39	35	22	44	
LSD 0.05	Trt=4	Cult=3	Trt by Cult=11		

Summary

Barley yields when averaged over cultivar were reduced 11, 21, and 50% by SD-45328 at 0.12, 0.25, and 0.5 lb/A, respectively. Yield reductions ranged from 0 (Bumper, Park) to 26% (Glenn, Bonanza, Beacon) at 0.12 lb/A; from 0 (Park) to 47% (Bonanza) at 0.25 lb/A, and from 29 (Vanguard, Larker) to 71% (Beacon) at 0.5 lb/A.

CGA-82725 in barley, Fargo 1981. Park barley was seeded May 14 in 6 inch row spacings. Herbicide applications were made to 1.5 to 2-leaf barley and wild oat June 8 and 3.5 to 4-leaf barley and wild oat June 16. Rainfall for a 1 week period following application at the 1.5 to 2 and 3.5 to 4-lf stage was 0.9 and 0.6 inch, respectively. 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. Wild oat and barley injury ratings were on July 17. Wild oat density was 2 plants/ft square.

Treatment		Rate oz/A	Barley Yield bu/A	Barley %ir	Barley %sr	% Control Wioa
CGA-82725	2-lf	2	57.4	5	0	91
CGA-82725	2-lf	4	49.9	14	0	98
CGA-82725	2-lf	6	41.5	25	0	100
CGA-82725+MCPA	2-lf	2+4	61.0	0	0	63
CGA-Bromoxynil	2-lf	2+4	57.3	7	0	88
CGA-82725	4-lf	2	43.4	40	0	100
CGA-82725	4-lf	4	16.4	80	0	100
GCA-82725	4-lf	6	11.6	83	0	100
CGA-82725+2,4-D	4-lf	2+4	57.4	6	0	88
Control			52.0	0	0	0
Mean			44.8	26	0	83
High mean			61.0	83	0	100
Low mean			11.6	0	0	0
Coeff. of variation			7.8	25	0	14
LSD(1 Percent)			8.2	12	0	22
LSD(5 Percent)			6.0	9	0	16
No. of reps			3.0	4	4	4

Summary

Barley injury with CGA-82725 was greater at the 4 than 2-leaf stage of application and was reduced by the addition of MCPA or 2,4-D. Wild oat control was good with all treatments except CGA-82725 applications with MCPA at the 2-leaf stage.

Wild oat control in flax, Fargo 1981. Preplant (PPI) treatments were applied and incorporated twice with a field cultivator on May 1. Culbert flax was seeded in 6 inch rows and preemergence treatments applied on May 2. Postemergence applications were made to 1 inch flax and 1.5 to 2-leaf wild oat on May 22 and 3 inch flax and 4-leaf wild oat on June 5. First rain was 3.3inch over a 3 day period of May 22 to 24. In addition 1.25 inch of rain fell during the first 2 weeks of June. PPI and PE treatments were in 17 gpa and postemergence in 8.5 gpa at 35 psi except barban was 4.5 gpa at 45 psi. Wild oat density was 10 plants/ft square.

Treatment	Rate lb/A	Flax Yield bu/A	Flax %ir	Flax %sr	% Cont Wioa
Triallate+MCPA PPI+P	1.5+0.25	18.1	0	1	97
Diallate+MCPA PPI+P	1.5+0.25	18.9	0	1	96
EPTC+MCPA PPI+P	3+0.25	19.3	0	6	92
Trifluralin+MCPA PPI+P	1+0.25	10.1	1	26	65
Dial+Metolachlor+MCPA PPI+P	1.5+2+0.25	17.8	0	6	96
Dial+Metolachlor+MCPA PPI+P	1.5+3+0.25	18.1	0	1	97
Triallate+EPTC+MCPA PPI+P	1+3+0.25	21.4	0	13	99
Triallate+Trif+MCPA PPI+P	1+0.75+0.25	16.6	0	20	96
Propachlor+Barban PE+P	3+0.37	6.9	0	1	60
Prcl+Barban+DPX-4189 PE+P	3+.37+.015	5.4	0	0	41
Diclofop P	0.75	13.1	0	0	86
Diclofop+Bromoxynil P	0.75+0.25	11.7	0	0	84
Diclofop+DPX-4189 P	0.75+0.015	7.5	8	10	77
Bas-9052+OC P	0.25+0.25G	16.0	0	0	92
Bas-9052+MCPA+OC P	0.25+0.25+0.25G	16.2	0	0	92
Bas-9052+Brox+OC P	0.25+0.25+0.25G	14.6	0	0	89
Bas-9052+DPX-4189+OC P	0.25+.015+.25G	7.5	33	3	83
Asulam+S P	0.75+.1%	17.2	0	0	96
Asulam+MCPA+S P	0.75+0.25+.1%	17.8	4	0	95
Control		3.3	0	0	0
Mean		13.9	2	4	82
High mean		21.4	33	26	99
Low mean		3.3	0	0	0
Coeff. of variation		21.5	135	95	6
LSD(1 Percent)		5.6	6	8	10
LSD(5 Percent)		4.2	4	6	7
No. of reps		4.0	4	4	4

Summary

Flax was injured by trifluralin or chlorsulfuron in combination with diclofop and Bas-9052. Wild oat control was good with all treatments except trifluralin and barban. Flax yields generally reflected wild oat control and/or crop injury with the various treatments.

Wild oat control in sunflower, Fargo 1981. Preplant (PPI) treatments were applied and incorporated twice with a field cultivator on May 1. Hybrid 894 sunflower was seeded in 30 inch rows and preemergence (PE) treatments applied on May 2. Postemergence application were made to 2-leaf sunflower and 1.5 to 2-leaf wild oat on May 22 and to 4 to 6-leaf sunflower and 3.5 to 4 leaf wild oat June 3. First rain was 3.3 inch over a 3 day period of May 22 to 24. In addition 1.25 inch rain fell during the first 2 weeks of June. PPI and PE treatments were applied in 17 gpa and postemergence in 8.5gpa at 35 psi except barban was in 4.5 gpa at 45 psi. Wild oat density was twenty plants/ft square.

Treatment	Rate lb/A	---Sunflower--- %ir	%sr	% Control Wioa
Triallate PPI	1	0	0	95
EPTC PPI	3	0	0	88
Trifluralin PPI	1	0	0	73
Trifluralin PPI	2	0	0	88
Ethafluralin PPI	0.94	0	0	75
UBI-S734 PPI	1.5	0	0	18
Triallate+UBI-S734 PPI	1+1.5	0	0	96
Triallate+Trifluralin PPI	1+1	0	0	95
Triallate+Chloramben PPI	1+2	0	0	94
Tria+Trif+Chloramben PPI	1+1+2	0	0	96
Triallate+EPTC PPI	1+3	1	0	99
Triallate+EPTC+Chloramben PPI	1+2+2	1	0	99
Tria+UBI-S734+Chloramben PPI	1+1.5+1.5	0	0	96
EPTC+Trifluralin PPI	2+1	0	0	91
EPTC+R-40244 PPI	3+0.5	0	0	91
EPTC+Chloramben PPI	2+2	0	0	87
Propachlor+Barban PE+P	5+0.75	0	0	83
Propachlor+Clam+Barban PE+P	3+2+0.75	0	0	79
Propachlor+Difenzoquat PE+P	5+0.75	50	0	94
Propachlor+SD-45328 PE+P	5+0.25	0	0	93
Diclofop P	1.5	0	0	91
Diclofop+R-40244 P	1.5+0.12	1	0	87
Bas-9052 P	0.25	0	0	87
Mean		2	0	87
High mean		50	0	99
Low mean		0	0	18
Coeff. of variation		52	0	7
LSD(1 Percent)		2	0	11
LSD(5 Percent)		2	0	9
No. of reps		4	4	4

Summary

Difenzoquat at 0.75 lb/A severely injured sunflower. Wild oat control generally was good with all treatments except UBI-S734.

Wild oat control in corn, Fargo 1981. Preplant (PPI) treatments were applied and incorporated twice with a field cultivator on May 1. Agsco 2xA1 corn was seeded in 30 inch rows and preemergence (PE) treatments applied on May 2. Postemergence applications were made to 1 inch corn and 1.5 to 2-leaf wild oat on May 21 and 2 to 3 inch corn and 3.5 to 4-leaf wild oat on June 4. First rain was 3.3 inch over a 3 day period of May 22 to 24. In addition 1.25 inch rain fell during the first 2 weeks of June. PPI and PE treatments were applied in 17 gpa and postemergence in 8.5 gpa at 35psi except barban was in 4.5 gpa at 45 psi. Wild oat density was 20 plants/ft square.

Treatment	Rate lb/A	-----Corn------ %ir	%sr	% Control Wioa
EPTC+R-25788 PPI	4	0	3	95
EPTC+R-25788+EXT PPI	4	3	0	93
Cyanazine-W PPI	3	5	3	73
Cyanazine-W PE	3	6	0	69
Propachlor PE	5	0	0	0
Propachlor+Barban PE+2-lf	5+0.37	0	0	75
Propachlor+Barban PE+2-lf	5+0.75	1	0	85
Propachlor+Difenzoquat PE+4-lf	5+0.62	29	0	88
Propachlor+Difenzoquat PE+4-lf	5+1	33	0	91
Propachlor+SD-45328 PE+4-lf	5+0.18	0	0	92
Propachlor+SD-45328 PE+4-lf	5+0.25	1	0	96
Cyanazine-W 2-lf	2	0	0	40
Cyanazine-W+LOTM 2-lf	1+.25G	0	0	66
Control		0	0	0
Mean		6	0	69
High mean		33	3	96
Low mean		0	0	0
Coeff. of variation		120	508	9
LSD(1 Percent)		13	3	12
LSD(5 Percent)		9	3	9
No. of reps		4	4	4

Summary

Difenzoquat at 0.62 and 1 lb/A injured corn. Wild oat control was good with EPTC, barban at 0.5lb/A, difenzoquat and SD-45328. Postemergence wild oat control with 1 lb/A cyanazine in combination with LOTM was better than 2 lb/A alone.

Wild oat control in soybeans, Fargo 1981. Preplant (PPI) treatments were applied and incorporated twice with a field cultivator on May 19. Evans soybean was seeded in 30inch rows and preemergence (PE) treatments applied on May 20. Postemergence applications were made to unifoliolate soybean and 1.5 to 2-leaf wild oat on June 8 and 2nd trifoliolate soybean and 3.5 to 4.5-leaf wild oat on June 16. First rain was 3.3 inch over a 3 day period of May 22 to 24. In addition 0.95 and 0.6 inch rain fell within 1 week after application of the early and late postemergence applications, respectively. PPI and PE treatments were applied in 17 gpa and postemergence in 8.5 gpa at 35 psi except barban was in 4.5 gpa at 45 psi. Wild oat density was 9 plants/ft square.

Treatment	Rate lb/A	----Soybean---- %ir	%sr	% Control Wioa
Alachlor PPI	3	0	0	92
Diallate+Propachlor PPI+PE	1.5+5	0	0	94
Triallate+Propachlor PPI+PE	1.5+5	0	0	99
Alachlor PE	3	0	0	55
Acetachlor PE	1.75	4	0	65
Propachlor PE	5	0	0	36
Propachlor+Barban PE+2-lf	5+0.37	8	0	95
Propachlor+Barban PE+2-lf	5+0.75	9	0	97
Propachlor+Difenzoquat PE+4-lf	5+0.62	28	0	93
Propachlor+Difenzoquat PE+4-lf	5+1	34	0	93
Propachlor+SD-45328 PE+4-lf	5+0.18	0	0	89
Propachlor+SD-45328 PE+4-lf	5+0.25	4	0	88
Diclofop 2-lf	1.25	0	0	99
Bas-9052+OC 2-lf	0.25+0.25G	0	0	100
Control		0	0	0
Mean		6	0	80
High mean		34	0	100
Low mean		0	0	0
Coeff. of variation		72	0	9
LSD(1 Percent)		8	0	13
LSD(5 Percent)		6	0	10
No. of reps		4	4	4

Summary

Difenzoquat at 0.62 and 1 lb/A injured soybeans. Wild oat control was good with all treatments except preemergence applications of alachlor, acetachlor and propachlor.

Wild oat control in drybeans, Fargo 1981. Preplant (PPI) treatments were applied and incorporated twice with a field cultivator, UI 111 pinto beans were seeded in 30 inch rows and preemergence (PE) treatments applied on June4. Postemergence applications were made to unifoliolate pinto beans and 1 to 2-leaf wild oat on June 22 and 1st trifoliolate pinto beans and 2 to 3-lf wild oat on June 29. Rainfall during June totaled 1.8 inches. PPI and PE treatments were applied in 17 gpa and postemergence in 8.5 gpa at 35 psi except barban was in 4.5 gpa at 45 psi. Wild oat density was 1 plant/ft square.

Treatment	Rate lb/A	--Drybeans-- %ir	%sr	--% Control-- Wioa	Fxtl
Alachlor PPI	3	2	0	91	95
Diallate+Propachlor PPI+PE	1.5+5	0	0	98	98
Triallate+Propachlor PPI+PE	1.5+5	0	0	97	97
Alachlor PE	3	5	0	77	98
Acetachlor PE	1.75	12	0	89	99
Propachlor PE	5	0	0	0	95
Propachlor+Barban PE+2-lf	5+0.37	0	0	93	93
Propachlor+Barban PE+2-lf	5+0.75	0	0	96	96
Propachlor+Difenzoquat PE+4-lf	5+0.62	11	0	96	96
Propachlor+Difenzoquat PE+4-lf	5+1	13	0	100	98
Propachlor+SD-45328 PE+4-lf	5+0.18	0	0	95	95
Propachlor+SD-45328 PE+4-lf	5+0.25	0	0	98	95
Diclofop 2-lf	1.25	0	0	98	96
Bas-9052+OC 2-lf	0.25+0.25G	0	0	99	99
Control		0	0	0	0
Mean		3	0	82	90
High mean		13	0	100	99
Low mean		0	0	0	0
Coeff. of variation		88	0	5	4
LSD(1 Percent)		6	0	9	8
LSD(5 Percent)		4	0	7	6
No. of reps		3	3	3	3

Summary

Acetachlor at 1.75 lb/A and difenzoquat at 0.62 and 1 lb/A injured pinto beans 11 to 13%. Foxtail control was excellent with all treatments and wild oat control good with all treatments except PE application of alachlor and propachlor.

PP009 in drybeans, Fargo 1981. UI 111 pinto beans were seeded in 30 inch rows June 4. PP009 was applied June 29 to 1st trifoliolate beans and 2 to 3-leaf wild oat with a bicycle-wheel sprayer delivering 8.5 gpa at 35 psi.

Treatment	Rate oz/A	----Drybeans---- %ir	%sr	-Percent Control- Wioa	Fxtl
PP009+OC	2+1qt	0	0	95	92
PP009+OC	4+1qt	0	0	97	96
Mean		0	0	96	94
High mean		0	0	97	96
Low mean		0	0	95	92
Coeff. of variation		0	0	1	5
LSD(1 Percent)		0	0	5	19
LSD(5 Percent)		0	0	3	10
No. of reps		4	4	4	4

Summary

Pinto bean tolerance to PP009 was excellent at both 2 and 4 oz/A. Wild oat and foxtail control was excellent regardless of rate.

Preemergence incorporated herbicides for foxtail control in wheat, NW-22 Fargo 1981. 'Era' wheat was seeded and herbicides applied and harrow incorporated twice unless indicated (1INC), May 15. Treatments were applied in 17 gpa at 35 psi to a Fargo silty clay soil with 7.5 pH and 5.5% organic matter. The soil surface 3 inches was powdery dry and 3.3 inches of rain occured on May 22-24. The experiment was a randomized complete block with four replications and treatments were to a 7 ft strip the length of 10 by 24 ft plots. Wheat injury (%ir) and stand reduction (%sr) and weed control was evaluated on June 10. The plot area was treated with MCPA at 6 oz/A to control broadleaf weeds after evaluation.

Treatment	Rate	-----Wheat-----			--Percent control--			
	oz/A	Yield bu/A	%ir	%sr	Yeft	Wimu	Rrpw	Kocz
Trifluralin 2INC-PEI	12	20.0	0	5	99	0	100	80
Trifluralin 1INC-PEI	12	18.0	0	0	97	0	95	95
Trifluralin-G 1INC-PEI	12	18.2	0	1	90	0	90	65
Ethafluralin 2INC-PEI	12	20.2	0	3	98	0	100	95
Ethafluralin 1INC-PEI	12	17.4	0	4	96	0	95	90
EL-5219 1INC PEI	12	21.6	0	0	93	0	90	80
EL-5219 2INC PEI	12	19.2	0	3	98	0	100	90
Trifluralin PEI	8	18.6	0	4	98	0	95	95
SSH-0860 PEI	24	20.0	0	0	83	99	90	85
Trifluralin+DPX-4189 PEI	8+0.5	16.9	0	5	99	100	100	100
Trifluralin+Triallate PEI	12+16	18.3	0	5	98	0	95	95
Profluralin PEI	12	18.6	0	0	97	4	95	95
Fluchloralin PEI	8	17.4	0	3	96	0	100	90
Fluchloralin PEI	10	17.3	0	1	97	0	99	90
Fluchloralin PEI	12	15.2	0	3	98	0	95	100
Fluchloralin+Triallate PEI	10+16	18.2	0	3	98	0	90	95
Fluchloralin+Triallate PEI	12+16	17.3	0	5	99	16	95	100
Pendimethalin PEI	12	17.7	0	1	99	5	95	98
Pendimethalin PEI	16	20.8	0	3	99	20	100	98
Pendimethalin PEI	24	20.1	0	3	98	23	95	95
Pendimethalin+Triallate PEI	16+16	20.1	0	4	100	5	100	95
Pendimethalin+Triallate PEI	24+16	17.5	0	6	99	21	98	95
DPX-4189 PEI	0.5	17.6	4	0	91	99	100	100
Control		14.2	0	0	0	0	0	0
Mean		18.3	0	2	92	16	92	88
High mean		21.6	4	6	100	100	100	100
Low mean		14.2	0	0	0	0	0	0
Coeff. of variation		15.3	625	120	4	66	0	0
LSD(1 Percent)		5.2	2	5	6	20	0	0
LSD(5 Percent)		3.9	1	4	5	15	0	0
No. of reps		4.0	4	4	4	4	1	1

Summary

The yellow foxtail and wild mustard densities were high, but redroot pigweed and kochia were variable and present in only one replication. All treatments gave 90% or more foxtail control except SSH-0860. Foxtail control was similar with one or two incorporations for the herbicides involved. Foxtail control was 9% less with trifluralin granuale than liquid, incorporated once. Wheat yield was increased up to 6 bu/A by treatment for foxtail control.

Preemergence weed control in wheat, Carrington 1981. Coteau wheat was seeded only about 1 in. deep because of hard soil on May 27 and preemergence incorporated (PEI) treatments applied and incorporated by raking and preemergence (PE) treatments applied on May 29. Weed control and wheat injury evaluation was on August 3 and harvest on September 3.

		Wheat					% control	
Treatment	Rate oz/A	Yield bu/A	Twt lb/bu	(%) Mois	%ir	%sr	Fxtl	Kocz
Trifluralin PEI	8	26.0	45.4	18	0	0	79	63
Profluralin PEI	8	24.8	45.0	18	0	0	69	59
Pendimethalin PEI	8	25.0	45.6	18	0	0	75	48
Pendimethalin PEI	12	23.7	44.4	19	0	0	83	38
Fluchloralin PEI	10	24.8	45.1	19	0	0	61	34
Trifluralin+Clsu PEI	8+0.5	21.0	47.1	13	1	6	100	98
Propachlor PE	48	30.6	45.0	18	0	0	67	0
Pendimethalin PE	12	27.2	47.8	12	0	0	93	90
Chlorsulfuron PE	0.5	22.2	47.1	12	0	1	100	100
Control		22.5	45.8	17	0	0	0	0
Mean		24.8	45.8	16	0	1	73	53
High mean		30.6	47.8	19	1	6	100	100
Low mean		21.0	44.4	12	0	0	0	0
Coeff. of variation		14.7	6.6	22	632	325	22	50
LSD(1 Percent)		7.1	5.9	7	2	5	32	51
LSD(5 Percent)		5.3	4.4	5	1	4	23	38
No. of reps		4.0	4.0	4	4	4	4	4

Summary

Chlorsulfuron at 0.5 oz/A alone or in combination with trifluralin gave 98% or more control of foxtail and kochia. Pendimethalin preemergence gave higher weed control than when preemergence soil incorporated.

Preemergence weed control in wheat, Williston 1981. Len HRS wheat was seeded at 75 lb/A, preemergence treatments applied and flex tine harrowed twice May 4. Research area was in fallow in 1980 and was broadcast fertilized with N at 70 lb/A. Harvest was 88 sq. ft of wheat area from each plot on August 14. Preemergence surface (PE) treatments were applied on May 5. Environmental conditions on May 4 were 63 F, 30% R.H., and northwest wind at 8 mph and on May 5 53 F, 49% R.H. and east wind at 15 mph.

Treatment		Rate oz/A	Wheat Yield bu/A	Wheat Twt lb/bu	Wheat Hght (cm)	%sr	%ir	Percent control Tymu	Percent control Ruth	Percent control Grft
Trifluralin	PEI	8	24.0	57.3	69	0	0	0	8	94
Profluralin	PEI	8	23.8	56.6	70	1	1	0	5	91
Pendimethalin	PEI	8	23.5	57.0	68	1	1	30	15	87
Pendimethalin	PEI	12	22.9	57.0	70	3	0	25	13	94
Fluchloralin	PEI	10	24.1	57.3	66	3	3	18	20	94
Trif+Clsu	PEI	8+.5	23.3	57.3	66	5	4	99	81	81
Propachlor	PE	48	22.4	56.3	68	0	0	19	0	46
Pendimethalin	PE	12	22.2	57.4	67	0	2	0	13	71
Chlorsulfuron	PE	0.5	21.7	56.6	64	1	3	100	81	55
Control			21.9	56.9	65	0	0	0	0	0
Mean			23.0	57.0	67	1	1	29	24	71
High mean			24.1	57.4	70	5	4	100	81	94
Low mean			21.7	56.3	64	0	0	0	0	0
Coeff. of variation			12.0	0.	4	155	181	63	74	17
LSD(1 Percent)			5.4	0.	9	4	5	36	34	23
LSD(5 Percent)			4.0	0.	6	3	3	27	25	17
No. of reps			4.0	1.0	2	4	4	4	4	4

Summary

Green foxtail control exceeded 80% for all PEI treatments. However, all PE herbicide treatments gave less green foxtail control than the PEI herbicide treatments. For example, pendimethalin at 12 oz/A PEI gave 93% green foxtail control compared to only 71 for pendimethalin at 12 oz/A PE. Russian thistle was only controlled by the treatment with chlorsulfuron.

Postemergence weed control in wheat, Carrington 1981. Coteau wheat was seeded only about 1 in. deep because of hard packed soil on May 27. Herbicides were applied to 4 leaf wheat and weeds less than 2 in. tall on June16. Wheat injury and weed control evaluations were on August 3. Harvest was on September 3.

Treatment	Rate oz/A	Yield bu/A (Wheat)	Twt lb/bu (Wheat)	(%) Mois (Wheat)	%ir	%sr	-% control- Fxtl	-% control- Kocz
2,4-D	4	19.8	44.1	19	0	0	0	55
Bromoxynil	4	24.9	49.5	13	0	0	0	93
Bromoxynil+MCPA	4+4	20.7	46.1	12	0	0	10	93
Dicamba+MCPA	1.5+4	23.0	48.1	12	0	0	0	99
Propanil	18	27.9	49.9	12	0	0	84	99
Propanil	24	29.4	50.0	13	1	0	85	96
Propanil+MCPA EST	18+4	27.4	49.3	13	0	0	82	93
Diclofop+Bromoxynil	12+4	28.2	48.9	14	0	0	88	91
Chlorsulfuron	0.25	29.1	49.0	13	0	0	93	95
Chlorsulfuron	0.5	28.2	50.8	12	0	0	100	100
Control		20.8	42.8	20	0	0	0	0
Mean		25.4	48.0	14	0	0	49	83
High mean		29.4	50.8	20	1	0	100	100
Low mean		19.8	42.8	12	0	0	0	0
Coeff. of variation		13.2	5.8	17	663	0	21	14
LSD(1 Percent)		6.5	5.4	5	1	0	20	23
LSD(5 Percent)		4.8	4.0	3	1	0	15	17
No. of reps		4.0	4.0	4	4	4	4	4

Summary

Foxtail control was similar with propanil at 18 oz/A, 24 oz/A or 18 oz /A with MCPA at 4 oz/A, chlorsulfuron at 0.25oz/A controlled green foxtail. Kochia control exceeded 90% with all herbicide treatments except 2,4-D at 4 oz/A.

Postemergence weed control in wheat, Langdon 1981. Rugby durum was seeded on June 8. Herbicides were applied to 2 leaf wheat, 2 to 4 leaf wild mustard and 0.5 in. tall foxtail on June 24 with 70 F, partly cloudy sky and a 10 to 20 mph wind from the northwest. Crop injury and weed control evaluation was on July 23.

Treatment	Rate oz/A	Wheat %ir	------Percent control------ Fxtl	Colq	Rrpw
2,4-D	4	0	0	100	99
Bromoxynil	4	0	0	92	94
Bromoxynil+MCPA	4+4	0	5	91	91
Dicamba+MCPA	1.5+4	0	9	93	95
Propanil	18	3	56	83	76
Propanil	24	4	90	84	84
Propanil+MCPA EST	18+4	4	73	88	81
Diclofop+Bromoxynil	12+4	0	73	89	84
Chlorsulfuron	0.25	0	33	84	90
Chlorsulfuron	0.5	0	31	96	94
Mean		1	37	90	89
High mean		4	90	100	99
Low mean		0	0	83	76
Coeff. of variation		185	42	7	6
LSD(1 Percent)		4	30	13	11
LSD(5 Percent)		3	22	9	8
No. of reps		4	4	4	4

Summary

Chlorsulfuron did not adequately control foxtail in this experiment, but controlled common lambsquarters and redroot pigweed. Foxtail control tended to be higher with propanil+MCPA than propanil alone at 18 oz/A. Propanil at 24 oz/A tended to give higher foxtail control than propanil at 18+MCPA at 4 oz/A.

Postemergence weed control in wheat, Williston 1981. Len wheat at 75 lb/A was seeded on fallow, broadcast fertilized with 70 lb/A N before seeding, May 4. Treatments were applied to four leaf wheat, 2 to 3 inch Russian thistle and other weeds less than 1 inch and at 69% R.H. and 58F on June 5. Weed populations were sparse. Harvest was 88 sq. ft of wheat on August 14.

		-----------Wheat-----------				-Percent control-		
Treatment	Rate oz/A	Yield bu/A	Twt lb/bu	Height (cm)	%ir	Tymu	Ruth	Grft
2,4-D	4	21.7	56.6	62	0	100	94	0
Bromoxynil	4	25.1	57.6	65	0	99	96	0
Bromoxynil+MCPA	4+4	27.5	57.8	68	0	98	94	0
Dicamba+MCPA	1.5+4	24.8	57.7	69	0	100	88	5
Propanil	18	24.4	58.0	64	5	79	0	55
Propanil	24	22.7	57.4	64	10	78	0	73
Propanil+MCPA EST	18+4	24.7	57.7	63	6	99	69	81
Diclofop+Bromoxynil	12+4	23.9	57.5	64	3	99	98	94
Chlorsulfuron	.25	26.4	57.3	69	0	100	95	74
Chlorsulfuron	.5	25.0	57.3	69	3	100	98	90
Control		23.8	57.4	71	0	0	0	0
Mean		24.5	57.5	66	3	86	66	43
High mean		27.5	58.0	71	10	100	98	94
Low mean		21.7	56.6	62	0	0	0	0
Coeff. of variation		14.1	0.	4	118	6	9	17
LSD(1 Percent)		6.8	0.	8	6	11	12	14
LSD(5 Percent)		5.0	0.	6	4	8	9	10
No. of reps		4.0	1.0	2	4	4	4	4

Summary

Chlorsulfuron at 0.25 oz/A controlled broadleaf weeds and gave 73% foxtail control. Propanil at 18 oz/A with MCPA ester at 4 oz/A gave higher foxtail control than propanil at 18 oz/A alone and similar foxtail control and wheat injury to propanil at 24 oz/A. Propanil alone did not control Russian thistle.

Broadleaf weed control in wheat, NW-22 Fargo 1981. 'Era' wheat was seeded to a silty clay soil with 7.5 pH and 5.5% organic matter on April 8. The entire plot area was treated with diclofop at 12 oz/A on May8. Treatments were applied to 4 to 6 leaf wheat, 3 to 4 leaf wild buckwheat, 5 leaf wild mustard, 8 leaf common lambsquarters, and 1 to 2 inch kochia on May 27. Soil conditions were wet and 0.05, 0.06, and 0.16 inch rain occurred on May 28, 31, June 1, and 3, respectively. Treatments were applied in 8.5 gpa to 8 by 24ft plots in a randomized complete block experiment. Crop injury and weed control evaluations were on June 9.

		-----Wheat-----						
	Rate	Yield			--Percent control--			
Treatment	oz/A	Bu/A	%ir	%sr	Wimu	Kocz	Colq	Wibw
2,4-D DMA	4	37.9	0	0	99	98	100	31
2,4-D SULV	4	47.8	0	0	100	95	100	35
MCPA DMA	4	39.9	0	0	96	50	100	25
MCPA	4	45.1	0	0	99	90	100	10
Dicamba+MCPA DMA	1.5+4	43.1	3	0	99	95	100	96
Dicamba+MCPA DMA	2+4	39.2	6	0	98	95	100	95
Dicamba-2E+MCPA DMA	1+4	39.8	1	0	99	88	100	85
Dicamba+2,4-D DMA	1+4	38.8	6	0	98	95	100	96
Dicamba+2,4-D DMA	1.5+4	41.3	6	0	99	95	100	99
Dicamba+DPX-4189	1.5+.25	40.6	3	0	100	100	100	100
Bromoxynil	4	39.8	0	0	99	100	100	100
Bromoxynil+MCPA	4+4	44.5	1	0	100	100	100	100
Bromoxynil+MCPA	3+6	43.2	0	0	100	100	100	100
Bromoxynil+MCPA	2+4	44.2	1	0	100	98	100	99
Bromoxynil+MCPA	2+6	42.5	0	0	100	100	100	100
Bromoxynil+2,4-D	2+4	41.0	1	0	100	100	100	100
Bromoxynil+2,4-D	3+4	46.0	0	0	100	100	100	100
Bromoxynil+DPX-4189	2+.25	47.2	3	0	100	90	100	98
DPX-4189	0.25	45.0	1	0	100	100	100	100
DPX-4189+WK	0.25+.25%	39.7	1	0	100	100	100	96
DPX-4189+WK	0.5+.25%	42.1	1	0	100	100	100	100
MC-10982	6	42.0	38	6	100	90	100	100
R-0625	2	38.6	6	0	100	100	99	86
R-0625	4	39.7	13	0	100	100	100	92
R-0625+WK	2+.125%	38.4	14	0	100	100	100	89
R-0625+WK	4+.125%	38.2	22	0	100	100	100	90
SAN-10315	24	45.6	15	0	100	100	100	100
SAN-10315	48	44.0	25	3	100	100	100	100
Dinoseb	24	43.6	8	0	100	70	98	85
Control		38.0	0	0	0	0	0	0
Mean		41.9	6	0	96	92	97	84
High mean		47.8	38	6	100	100	100	100
Low mean		37.9	0	0	0	0	0	0
Coeff. of variation		11.1	51	550	1	0	1	14
LSD(1 Percent)		8.6	5	3	2	0	2	22
LSD(5 Percent)		6.5	4	2	2	0	1	17
No. of reps		4.0	4	4	4	1	4	4

Summary

All treatments effectively controlled wild mustard and common lambsquarters. MC-10982, R-0625, and SAN-10315 at some of the rates used injured wheat. MCPA at 4 oz/A gave less kochia control than MCPA ester or 2,4-D amine at 4 oz/A. Wild buckwheat was controled by all herbicides except MCPA or 2,4-D applied alone. Wheat yield generally related to the level of weed control.

and fair with 0.25 oz/A.

Chlorsulfuron plus additives for weed control in wheat, NW-22 Fargo 1981. 'Era' wheat was seeded to a silty clay soil with 7.5pH and 5.5% organic matter on May 15. Treatments were applied during 75F and 60% relative humidity in 8.5 gpa at 35 psi to 8 by 24 ft plots with 2.5 leaf wheat, 2 to 3 leaf yellow foxtail, and 0 to 2 inch kochia, June 4. Kochia and yellow foxtail densities were 6 to 8 and 100 to 200 plants per square foot, respectively. The entire plots area was treated with toxiphene at 1.5 lb/A for aphid control, July 17. Weed control and wheat injury evaluations were on July 1 and August 20. Wheat was harvested on September 3.

Treatment	Rate oz/A	---Wheat--- Yield bu/A	Aug %ir	---July--- Yeft	Kocz	--August-- Yeft	Kocz
Chlorsulfuron	.125	19.	0	58	70	67	61
Chlorsulfuron+WK	.125+0.25%	17.	1	61	87	56	98
Chlorsulfuron+LOTM	.125+.25G	19.	1	64	89	70	100
Chlorsulfuron+OC	.125+.25G	20.	2	64	[illegible]	57	100

Weed control in wheat, Renville County 1981. Len wheat was seeded May 11 in 6 inch row spacings. Treatments were applied to 2 to 4-leaf wheat and 1 in foxtail on June 12 with a bicycle wheel sprayer delivering 8.5gpa at 35psi. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed control and crop injury ratings were on July 22.

Treatment	Rate oz/A	------------Wheat------------ Yield Bu/A	Twt lb/bu	%ir	% Cont Grft
Bromoxynil+MCPA	6+6	32.5	58.2	0	0
Bromoxynil+Diuron	4+8	32.3	59.5	5	69
Chlorsulfuron+WK	0.25+.1%	32.2	59.0	1	83
Chlorsulfuron+LOTM	0.25+0.25G	32.8	59.0	0	73
Chlorsulfuron	0.25	35.0	59.0	0	86
Chlorsulfuron+WK	0.5+.1%	35.2	59.0	3	96
Chlorsulfuron+WK	1+.1%	36.6	58.7	5	98
R-40244	4	32.4	58.8	5	0
MC10108	4	28.5	59.2	11	0
MC10108	8	28.7	59.6	25	65
RH-043-E	4	31.4	59.5	3	0
Control		29.2	58.2	0	0
Mean		32.2	59.0	5	47
High mean		36.6	59.6	25	98
Low mean		28.5	58.2	0	0
Coeff. of variation		17.4	0.	96	20
LSD(1 Percent)		10.8	0.	9	18
LSD(5 Percent)		8.0	0.	7	14
No. of reps		4.0	1.0	4	4

Summary

MC-10108 (acifluorfen methyl ester) was the only treatment which resulted in significant wheat injury. Foxtail control ranged from good to excellent with chlorsulfuron.

Postemergence foxtail control in wheat, NW-22 Fargo 1981. ' Era ' wheat was seeded to Fargo silty clay soil with 7.5 pH and 5.5% organic matter on May 15. Treatments were applied in 8.5 gpa at 35 psi to 3 leaf wheat and 2 leaf yellow foxtail growing in soil with adequate moisture on June 6. Rainfall was 0.04 inches on June7 and 0.06 on June10. Wheat injury (%ir) and weed control were evaluated on June17. The experiment was a randomized complete block with for replications and experimental units were 8 by 24ft. Kochia control was not evaluated because of a variable infestation.

Treatment	Rate oz/A	-----Wheat----- Yield bu/A	%ir	%Cont Yeft
Propanil E	24	17.6	5	90
Propanil-F	24	18.6	4	69
Propanil E+MCPA EST	18+4	16.3	8	97
Propanil-F+MCPA DMA	18+4	19.6	0	83
Pendimethalin	16	14.8	0	21
Pendimethalin	24	13.2	0	38
Pendimethalin+DPX-4189	16+0.25	17.9	0	89
Pendimethalin+DPX-4189	16+0.5	18.6	1	90
Pendimethalin+DPX-4189	24+0.25	20.4	0	87
Pendimethalin+Propanil	16+16	20.0	3	99
Pendimethalin+Propanil	16+20	18.7	1	86
Pendimethalin+Propanil	24+16	20.6	3	97
MSMA	32	18.4	0	78
MSMA+DPX-4189	32+0.25	20.0	1	95
Diclofop	12	16.4	0	64
Diclofop+MSMA	8+32	17.5	5	80
Diclofop+DPX-4189	8+0.25	23.1	0	88
Diclofop+Bromoxynil	12+4	17.1	0	72
CGA-82725	2	16.4	0	18
CGA-82725	4	18.2	0	87
CGA-82725+DPX-4189	2+0.25	21.2	0	86
DPX-4189+WK	0.125+.25%	19.5	3	85
DPX-4189+WK	0.25+.25%	19.8	0	91
DPX-4189+WK	0.5+.25%	18.9	0	92
DPX-4189+Bromoxynil+WK	0.25+4+.25%	17.8	0	96
DPX-4189+Propanil	0.25+18	18.9	3	98
Control		11.5	0	0
Mean		18.2	1	77
High mean		23.1	8	99
Low mean		11.5	0	0
Coeff. of variation		12.8	217	13
LSD(1 Percent)		4.3	5	19
LSD(5 Percent)		3.3	4	14
No. of reps		4.0	4	4

Summary

Yellow foxtail control exceeded 70% with all treatments except propanil-F, pendimethalin alone, diclofop at 12 oz/A, and CGA-82725 at 2 oz/A. None of the treatments caused any wheat stand reduction and injury was only slight with some treatments. Wheat yield generally related to weed control.

Propanil plus broadleaf herbicides for weed control in wheat, Casselton 19-81. Era HRS wheat, Rugby durum wheat, and Park barley were seeded on May 26. Herbicides were applied to 4leaf wheat and barley, 3 to 4 leaf foxtail, and 2 to 3 in. common lambsquarter and kochia on June 20 with 68F, 80% R.H. and a 5 mph wind.

Treatment	Rate oz/A	Barley %ir	Durum %ir	Hrsw %ir	---Percent Fxtl	Wimu	control--- Kocz	Colq
Propanil	24	23	15	12	91	95	95	100
Propanil	20	17	12	8	87	82	83	100
Propanil	18	17	8	7	75	53	60	90
Bromoxynil	4	0	0	0	8	100	100	100
Propanil+MCPA ester	18+4	18	13	8	87	100	100	100
Prnl+Bromoxynil+MCPA	18+4+4	25	15	13	91	100	100	100
Propanil+Bromoxynil	18+4	23	17	12	93	100	100	100
Propanil+Bromoxynil	18+2	22	15	12	93	100	100	100
Propanil+Bromoxynil	20+4	27	18	13	94	100	100	100
Propanil+Bromoxynil	20+2	20	15	7	89	100	100	100
Propanil+MCPA ester	20+4	23	20	13	89	100	100	100
Prnl+Bromoxynil+MCPA	20+4+4	30	20	18	94	100	100	100
Mean		20	14	10	83	94	95	99
High mean		30	20	18	94	100	100	100
Low mean		0	0	0	8	53	60	90
Coeff. of variation		13	20	23	6	3	6	0
LSD(1 Percent)		6	7	5	11	6	14	0
LSD(5 Percent)		5	5	4	8	4	10	0
No. of reps		3	3	3	3	3	3	3

Summary

Propanil at 18 oz/A with MCPA gave higher foxtail control than propanil alone. Bromoxynil with propanil tended to increase foxtail control more than MCPA. Broadleaf weed control was complete with all mixtures and bromoxynil alone. Injury from propanil or propanil mixtures to barley was generally more than to HRS or durum wheat.

Weed control in HRWW, Williston 1981. ND-7481 was seeded on fallow at 60 lb/A, September 10, 1980. Herbicides were all applied when tansy mustard was 2 to 3 in. tall and pepperweed was in rosette to 2 in. tall with 60 F, 40% R.H. and a dry soil surface. Weed control and wheat injury evaluation was on June 12. Harvest was 88 sq. ft area of wheat on July 29.

		----Winter	wheat----			
	Rate	Yield	Twt		-%	Control-
Treatment	oz/A	bu/A	lb/bu	%ir	Tamu	Gfpw
Bromoxynil+MCPA+Metolachlor	6+6+48	37.4	58.9	13	97	99
Bromoxynil+MCPA+Alachlor	6+6+40	35.1	58.9	33	99	98
Bromoxynil+MCPA+Metribuzin	6+6+4	33.4	58.9	25	80	98
Bromoxynil+MCPA	6	35.0	59.2	33	99	98
Bromoxynil+MCPA+Propachlor	6+6+48	36.5	59.2	33	98	98
2,4-D EST+Alachlor	8+30	33.3	59.2	0	100	100
2,4-D EST+Pendimethalin	8+24	35.4	59.3	20	100	100
Bromoxynil+MCPA+Pend	6+6+48	34.9	59.1	33	96	96
2,4-D EST+Propachlor	8+48	34.4	59.1	0	100	100
2,4-D EST+Metolachlor	8+48	34.5	59.1	0	100	100
2,4-D EST	8	34.5	59.3	0	100	100
Control		29.6	59.0	0	0	0
Mean		34.5	59.1	16	89	91
High mean		37.4	59.3	33	100	100
Low mean		29.6	58.9	0	0	0
Coeff. of variation		7.5	0.	181	3	2
LSD(1 Percent)		5.0	0.	54	5	4
LSD(5 Percent)		3.7	0.	40	4	3
No. of reps		4.0	1.0	4	4	4

Summary

Foxtail was controlled by all treatments containing a combination of metolachlor, alachlor, metribuzin, propachlor, or pendimethalin with 2,4-D or bromoxynil plus MCPA (data not presented). The combinations of the above grass control herbicides were applied with the postemergence broadleaf control herbicides, but the foxtail had not emerged at treatment. Tansy mustard and greenfloweringpepperweed control was also good with all treatments.

Russian thistle control in durum wheat, Williston 1981. Vic durum wheat was seeded into chemical fallow, April 16. Treatments were applied to 3.5 leaf wheat and 4 to 6 leaf Russian thistle on May15, except for 2,4-D which was applied to 4.5 to 5 leaf wheat and 6 to 10 leaf Russian thistle on May 22. Environmental conditions were 62 F and 15 mph wind on May 15 and 63 F, 43% R.H. and 10 mph wind on May 22. Harvest was 80 sq. ft on August 14. One nozzle of the four was plugged for all treatments except 2,4-D.

		-----------Wheat-----------				
Treatment	Rate oz/A	Yield bu/A	Twt lb/bu	Height (cm)	--% control-- Grft	Ruth
2,4-D	6	40.5	61.2	92	0	88
Bromoxynil	6	40.3	60.8	88	0	54
Bromoxynil+MCPA	4+4	40.6	61.0	92	43	66
Bromoxynil+MCPA	6+6	40.4	61.2	92	10	66
Diclofop+Bromoxynil	16+6	39.3	61.1	84	69	65
Chlorsulfuron	.25	35.6	61.0	85	10	8
Dicamba+MCPA	1.5+4	39.6	61.2	89	25	53
Control		35.3	60.8	89	0	0
Mean		39.0	61.0	89	20	50
High mean		40.6	61.2	92	69	88
Low mean		35.3	60.8	84	0	0
Coeff. of variation		10.6	0.	3	93	26
LSD(1 Percent)		8.3	0.	11	36	26
LSD(5 Percent)		6.1	0.	7	27	19
No. of reps		4.0	1.0	2	4	4

Summary

Chlorsulfuron at 0.25 oz/A did not give adequate Russian thistle and green foxtail control. Diclofop with bromxynil gave approximately 65% control of both Russian thistle and green foxtail. 2,4-D gave better Russian thistle control than bromoxynil or bromoxynil with MCPA. However, the 2,4-D was applied at a later date when possibly more of the Russian thistle had emerged.

Foxtail control in barley, NW-22 Fargo 1981. ' Beacon ' barley was seeded in 6 inch rows and preemergence incorporated (PEI) treatments applied and harrowed twice on May 15. Postemergence (P) treatments were applied to 3-leaf barley and 2-leaf yellow foxtail on June 4. PEI treatments were applied in 17 gpa and P treatments in 8.6 gpa both at 35 psi. The soil surface was dry 2 inches deep at PEI treatment and 3.3 inches of rain occurred between May22 to 24. Soil Moisture was adequate after P treatments and 0.12 in of rain occurred on June 5 and 0.04 in June 7 and 0.06 on June 10. Wheat injury (%ir) and weed control evaluations were on June 17.

Treatment	Rate oz/A	----Wheat---- Yield bu/A	%ir	-% control- Yeft	Kocz
Trifluralin PEI	8	57.9	1	95	93
Trifluralin PEI	12	60.0	0	98	98
Trifluralin+Triallate PEI	12+16	58.5	0	100	96
Fluchloralin PEI	10	60.0	1	90	88
Fluchloralin PEI	12	58.8	0	94	90
Fluchloralin+Triallate PEI	12+16	60.9	0	96	92
Pendimethalin PEI	8	60.8	0	90	83
Pendimethalin PEI	12	57.7	1	92	80
Pendimethalin PEI	16	60.5	0	95	88
Pendimethalin+Triallate PEI	16+16	58.7	0	98	94
Propanil E P	18	55.4	5	84	96
Propanil E+MCPA EST P	18+4	50.2	10	89	99
Pendimethalin P	16	59.2	0	63	70
Pendimethalin+Propanil E P	16+18	56.2	9	95	100
Diclofop+Bromoxynil P	12+4	54.4	5	78	97
Control		57.6	0	0	0
Mean		57.9	2	85	85
High mean		60.9	10	100	100
Low mean		50.2	0	0	0
Coeff. of variation		7.4	171	10	7
LSD(1 Percent)		8.0	7	16	12
LSD(5 Percent)		6.0	5	12	9
No. of reps		4.0	4	4	4

Summary

None of the treatments reduced barley stand. Treatments with propanil and the diclofop plus bromoxynil treatments caused slight visual injury to the barley and tended to reduce yields compared to that of the control. Foxtail control exceeded 80% for all treatments except with postemergence pendimethalin applied alone.

Depth of flax seeding and herbicide incorporation depth, Casselton 1981. Herbicides were applied in 17gpa and field cultivator plus harrow incorporated to 2 (SINC) or 4 (DINC) in. twice, surface packed and Culbert flax seeded .5 to 1 or 1 to 2 in. deep, May 7. Soil surface was dry to 3 in. MCPA at 4 oz /A was applied to all plots and BAS-9052 at 4 oz/A plus 1 qt/A emulsifiable petroleum oil concentrate to control plots when the flax was 2 to 4 in. tall and weeds less than 4 in., June 10. Flax was not harvested because of an infestation of Canada thistle. Weed control and flax injury were evaluated on June 25.

			--Deep seeded--			Shallow seeded		
		Rate	--Flax---		%Cont	--Flax---		%Cont
Treatment	Incorporation	lb/A	%ir	%sr	Fxtl	%ir	%sr	Fxtl
EPTC-G+MCPA PPI+P	(SINC)	3+0.25	1	5	89	0	0	89
EPTC-G+MCPA PPI+P	(DINC)	3+0.25	0	9	91	0	0	86
EPTC+MCPA PPI+P	(SINC)	3+0.25	0	11	87	0	0	81
EPTC+MCPA PPI+P	(DINC)	3+0.25	0	9	84	0	0	81
EPTC+MCPA PPI+P	(SINC)	6+0.25	4	14	90	1	4	92
EPTC+MCPA PPI+P	(DINC)	6+0.25	3	19	93	1	5	92
EPTC&EXT+MCPA PPI+P	(SINC)	3+0.25	1	8	95	1	0	97
EPTC&EXT+MCPA PPI+P	(DINC)	3+0.25	1	21	96	3	11	98
Trifluralin+MCPA PPI+P	(SINC)	0.75+0.25	0	30	91	3	53	92
Trifluralin+MCPA PPI+P	(DINC)	0.75+0.25	0	49	95	0	31	95
Trifluralin+MCPA PPI+P	(SINC)	1.5+0.25	14	59	97	4	74	95
Trifluralin+MCPA PPI+P	(DINC)	1.5+0.25	11	61	97	5	63	96
Metolachlor+MCPA PPI+P	(SINC)	2+0.25	0	7	93	0	2	89
Metolachlor+MCPA PPI+P	(DINC)	2+0.25	0	12	90	0	0	91
Metolachlor+MCPA PPI+P	(SINC)	3+0.25	0	7	95	0	1	96
Metolachlor+MCPA PPI+P	(DINC)	3+0.25	0	7	96	0	0	96
Metolachlor+MCPA PPI+P	(SINC)	4+0.25	6	16	96	1	4	96
Metolachlor+MCPA PPI+P	(DINC)	4+0.25	5	16	96	3	4	95
Meto+Dial+MCPA PPI+P	(SINC)	3+1.5+.25	4	20	98	6	21	98
Meto+Dial+MCPA PPI+P	(DINC)	3+1.5+.25	5	15	96	0	10	96
Mean			3	20	93	1	14	92
High mean			14	61	98	6	74	98
Low mean			0	5	84	0	0	81
Coeff. of variation			230	51	7	210	51	6
LSD(1 Percent)			12	19	11	5	14	11
LSD(5 Percent)			9	14	9	4	10	8
No. of reps			4	4	4	4	4	4

Summary

Shallow flax seeding reduced EPTC and metolachlor injury or stand loss of flax regardless of herbicide depth. Shallow flax seeding only reduced the loss of flax stand at the shallow seeded deep incorporated 0.75 lb/A trifluralin treatment. Green and yellow foxtail was similar with all treatments, but control was higher with EPTC with R-33865 (EXT.) than EPTC alone.

Response of flax varieties to asulam, Fargo 1981. The flax varieties were seeded to a Fargo clay soil with 6% organic matter and 7.2 pH on April 30. Asulam at 1 and 1.5 lb/A with 0.2% surfactant from Rhodia was applied across the flax varieties which were 4 to 5 inches tall on June 1. A 0.16 in. rain occurred within 1.5 h after treatment. Thus, the asulam at same rates as above was applied again to 5 to 6 in. flax on June 10. The flax was relatively weed free. Injury evaluations were taken on June 24. The individual plots were 8 by 10 ft. Harvest was on Sept. 8.

Cultivar	Asulam rate[1]		
	0	1	2
	Yield, bu/A (% of control)		
Culbert	12.8	12.2(95)	8.7(68)
Linott	15.1	12.3(81)	7.7(51)
Dufferin	15.0	18.7(125)	16.4(109)
Wishek	12.0	14.2(118)	9.4(78)
Culbert 79	17.2	17.6(102)	8.9(52)
Flor	16.0	10.9(68)	10.0(62)
	LSD 5% Variety x treatment=3.5		
	Height, cm (% of control)		
Culbert	58	52(90)	50(86)
Linott	60	52(87)	49(82)
Dufferin	68	65(96)	59(87)
Wishek	66	56(85)	49(74)
Culbert 79	64	54(84)	53(83)
Flor	71	54(76)	49(69)
	LSD 5% Variety x treatment=4		
	Inj. rating		
Culbert	0	5	10
Linott	0	12	22
Dufferin	0	3	8
Wishek	0	9	25
Culbert 79	0	3	7
Flor	0	18	35
	LSD 5% Variety x treatment=5		

[1] Asulam rate: 0=untreated, 1 and 2 were asulam applied at 1 and 1.5 lb/A, on June 1 and again on June 10.

Summary

Seed yield of Flor flax was reduced by asulam at rate 1. Asulam at rate 2 reduced flax seed yield for all varieties except Dufferin and Wishek. Dufferin was most tolerant and Flor was most susceptible to asulam of the varieties based upon yield, height, and injury rating data.

Flax variety response to asulam, Langdon 1981. The various flax cultivars were seeded on June 8. Asulam was applied to flax 4 to 6 in. tall in 8 by 6 ft plots replicated four times. Flax was relatively weed free. Visual evaluation was on July 24.

Cultivar	Flax yield, Bu/A: Untreated	Flax yield, Bu/A: Asulam 16 oz/A	Mean
Linott	9.6	7.6	8.6
Culbert	8.9	9.1	9.0
Culbert 79	10.9	9.8	10.4
Dufferin	11.0	10.3	10.6
Wisek	10.2	9.0	9.6
Flor	11.4	8.0	9.7
Mean	10.3	9.0	
LSD (0.05)	Trt = 1.0	Cult = 1.8	Trt by Cult = 2.5

Summary

The yield of Flor was reduced and Linott tended to be reduced by asulam at 16 oz/A compared to the untreated flax. None of the cultivars were injured more than 10% according to visual evaluations (data not presented).

Flax response to applications of asulam with various volumes, NW-22 Fargo 1981. Culbert flax was seeded to a silty clay with 7.5 pH and 5.5% organic matter, May 2. Treatments were applied to 4 in flax and two to five leaf wild oats, June 6. The 4.7 gpa volume was with 80005 nozzles at 45 psi and 8.6 with 8001 and 17.0 with 8002 nozzles at 35 psi. Evaluations for wild oats control and flax injury were on July 20.

Treatment	Rate oz/A	Volume gpa	Flax Yield bu/A	Flax %ir	Flax %sr	% Control Wioa
Asulam	20	4.7	7.8	1	0	32
Asulam	20	8.6	11.3	0	0	53
Asulam	20	17.0	9.2	0	0	46
Asulam+S .2%	20	4.7	14.1	0	0	92
Asulam+S .2%	20	8.6	15.3	1	0	96
Asulam+S .2%	20	17.0	14.7	0	0	90
Control			3.8	0	0	0
Mean			10.9	0	0	58
High mean			15.3	1	0	96
Low mean			3.8	0	0	0
Coeff. of variation			19.4	342	0	19
LSD(1 Percent)			4.3	2	0	23
LSD(5 Percent)			3.1	2	0	17
No. of reps			4.0	4	4	4

Summary

Flax was not injured by asulam regardless of spray volume. Asulam with surfactant applied with all spray volumes increased wild oat control compared to without surfactant. Wild oats control tended to be lower when asulam was applied in 4.7gpa than higher volumes without surfactant.

Flax response to time of application of Asulam, NW-22 Fargo 1981. Culbert flax was seeded to a silty clay with 7.5 pH and 5.5% organic matter, May 2. Treatments were applied to 4 in flax and two to five leaf wild oat on June 6. The AM treatment was at 8:00 AM with a slight dew, 55F and 80%RH; Noon treatments were at 1:00 PM with 78F and clear sky; 6:00 PM treatments were with 75F and clouds and the PM treatment was followed by a rain within 2 hours. Evaluations were on July 20.

Treatment	Time of application	lb/A	------------Flax------------ Yield bu/A	%ir	%sr	% Cont Wioa
Asulam+S .2%	AM	0.75	14.4	0	0	80
Asulam+S .2%	Noon	0.75	14.4	0	0	76
Asulam+S .2%	PM	0.75	11.6	0	0	50
Asulam+S .2%	AM	1.5	15.8	3	0	96
Asulam+S .2%	Noon	1.5	14.8	0	0	98
Asulam+S .2%	PM	1.5	17.4	1	0	96
Control			4.9	0	0	0
Mean			13.3	1	0	71
High mean			17.4	3	0	98
Low mean			4.9	0	0	0
Coeff. of variation			13.9	256	0	9
LSD(1 Percent)			3.8	3	0	13
LSD(5 Percent)			2.8	2	0	9
No. of reps			4.0	4	4	4

Summary

Time of day when asulam was applied did not influence wild oats control or flax yield, except for the asulam at 0.75 lb/A applied in the PM. However, the reduced wild oat control with the PM treatment may have been from a loss of the asulam by the rain which occurred after treatment. Wild oats control with asulam at 1.6 lb/A was not influenced by time of application or the rain which occurred after the PM treatment.

Weed control in flax, Casselton 1981. 'Culbert' flax was seeded to a Fargo silty clay soil with a 7.7 pH and 5.0% organic matter and preemergence (PE) treatments applied in 17 gpa at 35 psi on, May 7. The soil surface 2 inches was dry and the first rain of 2.2 inches occurred on May 22-23. Postemergence (P) treatments were applied in 8.5 gpa at 35 psi to 4 to 8 inch flax, kochia, and wild mustard and 4 to 5 leaf green and yellow foxtail (Fxtl) on June16. Soil moisture was adequate, temperature 75F and relative humidity 40% at treatment and 0.05 inch rain occurred in 1 day and 0.38 inches on the 5th day after treatment. The experiment was a randomized complete block with four replications and treatments were a 7 ft strip the length of 10 by 24 ft plots. Percent flax injury (%ir) and stand reduction (%sr) and weed control evaluations were on July 13.

Treatment	Rate lb/A	---Flax-- %ir	%sr	Percent Fxtl	Wimu	Control Colq
Propachlor+MCPA PE+P	4+.25	0	0	67	96	100
Metolachlor+MCPA PE+P	3+0.25	2	0	87	93	97
Asulam+S Rhodia P	1+.2%	1	0	93	58	0
Asulam+MCPA+S P	0.75+.25+.2%	2	0	92	100	100
Bas-9052+MCPA+OC P	0.2+.25+.25G	1	0	100	94	96
Bas-9052+2,4-D+OC P	0.2+.25+.25G	6	0	95	100	100
Bas-9052+DPX-4189+OC P	0.2+.016+.25G	12	0	100	100	100
Bas-9052+DPX-4189+OC P	0.2+.008+.25G	8	0	98	99	100
Bas-9052+2,4-D P	0.2+.25	3	0	88	98	98
Dalapon+MCPA P	0.75+0.25	3	0	63	96	100
Dalapon+2,4-D P	0.75+0.25	6	3	53	95	94
Dalapon+MCPA+Picloram P	0.75+.25+.016	3	0	52	97	97
Dalapon P	0.75	0	0	76	0	0
Dalapon+DPX-4189 P	0.75+0.016	1	0	88	98	100
DPX-4189+S P	0.008+.25%	1	0	81	99	98
DPX-4189+S P	0.016+.25%	12	3	89	100	100
Bromoxynil P	0.25	8	0	19	97	98
Bromoxynil+MCPA P	0.25+0.25	5	0	0	100	100
Diclofop+Bromoxynil P	1+0.25	4	0	80	90	88
Bas-9052 OC P	0.2	0	0	100	0	0
CGA-82725 OC P	0.2	0	0	99	0	0
RO-13-8895 OC P	0.2	0	0	100	0	0
CGA-82725+DPX-4189 OC P	0.2+0.008	5	0	98	100	100
RO-13-8895+DPX-4189 OC P	0.2+0.008	6	0	99	100	100
Control		0	0	0	0	0
Mean		4	0	76	76	75
High mean		12	3	100	100	100
Low mean		0	0	0	0	0
Coeff. of variation		106	603	15	3	5
LSD(1 Percent)		7	3	21	5	6
LSD(5 Percent)		5	2	16	4	5
No. of reps		4	4	4	4	4

Summary

All weed densities were high. BAS-9052 alone or with MCPA, 2,4-D or chlorsulfuron plus petroleum oil additive gave 95% or more green and yellow foxtail control. However, foxtail control tended to be reduced by the addition of 2,4-D to BAS-9052. Chlorsulfuron in combination with BAS-9052, CGA-88725, or RO-13-8895 gave good broad-spectrum weed control with only slight flax injury. Asulam plus MCPA gave good broadspectrum weed control, but asulam without MCPA did not adequately control common lambsquarters or wild mustard. The addition of an oil to BAS9052 plus 2,4-D did not increase flax injury.

Weed control in flax, Carrington 1981. Preplant treatments were applied and rototiller incorporated on May 26. Wishek flax was seeded on May27 and pre-emergence herbicides applied on May 29. Flax injury and weed control evaluation was on August 3.

Treatment	Rate oz/A	---Flax--- %ir	%sr	------Percent control------ Fxtl	Colq	Wibw	Rrpw
EPTC+MCPA PPI+P	2+0.25	5	3	94	90	13	70
Trifluralin+MCPA PPI+P	0.5+0.25	0	0	78	82	64	95
Profluralin+MCPA PPI+P	0.5+0.25	0	0	73	92	56	70
Metolachlor+MCPA PPI+P	2+0.25	3	0	78	78	25	0
Propachlor+MCPA PE+P	4+0.25	0	0	53	75	0	0
Metolachlor+MCPA PE+P	2+0.25	0	0	89	68	20	0
Bromoxynil+MCPA P	0.25+0.25	0	0	0	99	78	100
Bromoxynil P	0.25	0	0	10	83	93	100
Diclofop+Bromoxynil P	1+0.25	0	0	58	99	91	95
BAS-9052+MCPA P	0.2+0.25	0	0	78	95	0	0
BAS-9052 P	0.2	0	0	100	0	0	0
MCPA+Dalapon P	0.25+0.75	0	0	53	87	0	0
Asulam P	1	0	0	72	65	0	40
Asulam+MCPA P	0.75+0.25	0	0	67	98	60	80
Mean		1	0	64	79	36	46
High mean		5	3	100	99	93	100
Low mean		0	0	0	0	0	0
Coeff. of variation		389	432	26	15	60	0
LSD(1 Percent)		4	1	32	22	41	0
LSD(5 Percent)		3	1	24	16	31	0
No. of reps		4	4	4	4	4	1

Summary

Bromoxynil alone or with MCPA or diclofop gave the highest control of broadleaf weeds of all treatments. Flax was not injured of importance by any treatments.

Weed control in flax, Williston 1981. Preplant incorporated (PPI) treatments applied and incorporated first with a cultivator with harrow and second with a Triple K implement, Linnot flax seeded at 42 lb/A, and preemergence (PE) herbicides applied on May 5 with 60 F, 35% R.H., and a 15 mph east wind (spray boom shielded). Postemergence herbicides (P) were applied to 3 to 4 in. flax, 3.5 to 4.5 leaf wild oat, 3 in. Russian thistle, and other weeds $\frac{1}{4}$-1 in. on June 5. The experiment was on fallow which was broadcast fertilized with 70 lb/A N. Harvest was from an 84 sq. ft area on August 20.

		-----------	Flax	----------			----	Percent	control	----	
Treatment	Rate oz/A	Yield bu/A	Twt lb/bu	Hght (cm)	%sr	%ir	Tymu	Ruth	Grft	Vwht	Wioa
EPTC+MCPA PPI+P	2+0.25	12.1	54.9	51	19	36	100	38	99	98	96
Trifluralin+MCPA PPI+P	.5+0.25	10.2	55.1	56	5	3	100	78	96	40	75
Profluralin+MCPA PPI+P	.5+0.25	8.2	55.4	49	8	8	98	53	96	33	51
Metolachlor+MCPA PPI+P	2+0.25	7.0	54.9	54	1	4	100	35	94	73	30
Propachlor+MCPA PE+P	4+0.25	6.2	55.6	53	0	0	100	29	33	0	0
Metolachlor+MCPA PE+P	2+0.25	7.3	55.2	54	3	4	100	39	86	18	21
Bromoxynil+MCPA P	0.25+0.25	5.8	55.8	51	0	2	100	98	0	0	0
Bromoxynil P	0.25	6.1	55.6	50	0	0	100	100	0	0	0
Diclofop+Bromoxynil P	1+0.25	12.4	55.1	54	0	0	98	99	74	0	99
Bas-9052+MCPA P	0.2+0.25	13.4	54.9	53	0	2	100	56	84	99	98
Bas-9052+DPX-4189 P	0.2+0.016	12.8	55.4	52	0	6	100	100	99	99	96
MCPA+Dalapon P	0.25+0.75	5.9	55.0	54	0	0	100	43	86	93	65
Asulam P	1	9.5	54.1	47	0	5	90	5	79	97	97
Asulam+MCPA P	0.75+0.25	9.0	54.8	46	0	13	100	18	54	55	63
Control		6.3	55.1	55	0	1	0	0	0	0	0
Mean		8.8	55.1	52	2	6	92	52	65	47	53
High mean		13.4	55.8	56	19	36	100	100	99	99	99
Low mean		5.8	54.1	46	0	0	0	0	0	0	0
Coeff. of variation		12.2	0.	6	166	125	4	29	27	28	25
LSD(1 Percent)		2.0	0.	10	7	13	7	29	33	24	24
LSD(5 Percent)		1.5	0.	7	6	10	5	22	25	18	18
No. of reps		4.0	1.0	2	4	4	4	4	4	4	4

Summary

Important injury to flax only occurred from EPTC and asulam with MCPA. However, the EPTC treated flax, still approached having the highest yield of all the treatments. The overall highest control of all weed was with BAS-9052 with chlorsulfuron. Bromoxynil and chlorsulfuron were the only herbicides to effectively control Russian thistle. Diclofop and BAS-9052 in combination with various broadleaf herbicides appeared promising for broadspectrum weed control in flax.

Preplant weed control in sunflower, Casselton 1981. Preplant (PPI) herbicides were applied and twice incorporated with field cultivator plus harrow in a silty clay soil, dry to about 3 inches, and with 7.4 pH and 5.5% organic matter, May 11. Hybrid 894 sunflower was seeded in 30 inch rows and preemergence (PE) treatment appled on May 11. Herbicides were applied in 17 gpa at 35 psi to a 7ft strip the lenght of 10 by 30 foot plots. The first rain after treatment was 2.2 inches on May 22 - 23 Sunflowers were not harvested because of a midge infestation which damaged the heads. Sunflower injury and weed control evaluations were on June 11

	Rate	-Sunflower-		--Percent	control--	
Treatment a	lb/A	%ir	%sr	Fxtl	Wimu	Kocz
EPTC PPI	2	0	0	86	30	20
EPTC PPI	3	1	0	96	29	36
EPTC&R-33865 PPI	2	0	0	85	29	0
EPTC&R-33865 PPI	3	3	0	94	44	23
EPTC+Chloramben PPI	3+1.5	6	3	96	86	91
EPTC+Chloramben PPI	3+3	13	3	98	94	95
EPTC+R-40244 PPI	3+0.5	1	0	97	93	97
EPTC+R-40244 PPI	3+0.25	3	0	93	88	84
R-40244 PPI	0.5	0	0	14	100	89
Trifluralin PPI	1	0	0	91	10	85
Trifluralin-G PPI	1	1	0	73	0	56
Trifluralin+Metr-W PPI+PE	1+.125	4	0	90	68	93
Trifluralin+Metr-W PPI+PE	1+.187	19	13	92	91	93
Trifluralin+Metr-W PPI+PE	1+0.25	14	15	94	96	97
Trifluralin+Metr-W PPI	1+.125	16	18	92	96	93
Trifluralin+Metr-W PPI	1+.187	23	46	92	96	92
Trifluralin+Metr-W PPI	1+0.25	28	54	94	100	93
Trifluralin PPI	0.75	0	0	91	0	90
Trifluralin+Bifenox PPI	0.75+2	3	0	92	29	89
Trifluralin+Chloramben PPI	1+1.5	0	0	97	78	94
Trifluralin+Chloramben PPI	1+2	1	3	96	71	94
Trifluralin+R-40244 PPI	1+0.5	0	1	96	96	97
Trifluralin+Linuron PPI	1+1.5	3	3	98	85	96
Fluchloralin PPI	0.94	0	0	93	10	92
EL-5219 PPI 1INC	0.94	3	0	91	20	93
Profluralin PPI	1	0	0	91	0	93
Profluralin+Prometryn PPI	1+1.6	10	0	93	85	97
Chloramben PPI	2	0	0	76	74	84
Pendimethalin PPI	1	0	0	90	10	88
Pendimethalin PPI	1.5	0	0	96	40	83
Pendimethalin-DF PPI	1.5	0	3	91	14	88
Pend+Metribuzin-W PPI	1.5+.125	31	25	93	90	94
Pendimethalin+Clam PPI	1.5+2	0	0	92	83	90
UBI-S734 PPI	1.5	0	0	86	0	0
UBI-S734-F PPI	1.5	0	0	85	10	8
UBI-S734+Chloramben PPI	1.5+1.5	4	3	86	71	91

Table continued next page.

Table . Continued

Treatment a	Rate lb/A	-Sunflower- %ir	%sr	--Percent Fxtl	control-- Wimu	Kocz
Metolachlor+Prometryn PPI	2+1.6	5	10	94	84	89
Chloramben PE	2	0	0	54	78	90
Alachlor PPI	2.5	0	0	90	36	49
MON-097 PPI	1.75	8	6	98	80	78
Mean		5	5	89	57	77
High mean		31	54	98	100	97
Low mean		0	0	14	0	0
Coeff. of variation		107	124	7	33	14
LSD(1 Percent)		10	12	11	35	20
LSD(5 Percent)		7	9	8	27	15
No. of reps		4	4	4	4	4

Summary

Chloramben, R-40244, linuron, and prometryn when included in the treatment gave more than 70% wild mustard control without important sun flower injury. Chloramben incorporated at 1.5 or 2 lb/A or surface applied at 2 lb/A all gave similar wild mustard control. Metribuzin was injurious to sunflower. Trifluralin granuales gave less weed control than the liquid formulation. Green and yellow foxtail control was 70% or more with all treatments except chloramben preemergence and R-40244

a Metr-W = wettable powder formulation of metribuzin

Preemergence weed control in sunflower, Casselton 1981. 894 hybrid sun flower was seeded and preemergence treatments applied to a Fargo silty clay soil with 7.4 pH and 5.5% organic matter, May 11. The soil surface 3 inches was dry and 3.3 inch rain occurred on May 22-23. Herbicides were applied in 17 gpa at 35 psi to a 7ft strip length of 10 by 30ft plots. Sunflower injury and stand reduction and weed control evaluations were on June 11. Sunflower was not harvested because of a midge infestation.

Treatment	Rate lb/A	-Sunflower- %ir	%sr	--Percent Fxtl	control-- Wimu	Kocz
Acetachlor PE	1.75	0	0	84	45	70
Acetachlor PE	2.25	6	0	78	76	81
Acetachlor+Chloramben PE	1.75+2	4	0	89	86	88
Alachlor+Bifenox PE	2+1.5	3	0	81	64	60
Alachlor+Oxyfluorfen PE	2+.375	3	0	61	88	68
Alachlor+Oxyfluorfen PE	2+0.5	3	0	74	86	78
R-40244 PE	0.5	0	0	26	75	89
R-40244 PE	0.1	3	0	34	95	96
RH-9861 PE	1.5	3	0	34	48	48
RH-9861 PE	2	8	0	35	13	34
RH-9861+Alachlor PE	1.5+2	6	0	71	76	80
Propachlor+R-40244 PE	5+0.5	5	0	78	83	89
Propachlor+Linuron PE	5+1.5	6	0	78	79	85
Metolachlor+Prometryn PE	2+1.6	8	0	75	80	91
Prometryn PE	1.6	5	0	46	76	86
Alachlor PE	2.0	3	0	60	43	63
Metolachlor PE	2.0	0	0	71	13	34
Alachlor PE	2.5	1	0	73	36	78
Metolachlor PE	2.5	0	0	78	46	34
Mean		3	0	64	63	71
High mean		8	0	89	95	96
Low mean		0	0	26	13	34
Coeff. of variation		165	0	17	24	29
LSD(1 Percent)		10	0	20	29	39
LSD(5 Percent)		8	0	15	22	29
No. of reps		4	4	4	4	4

Summary

None of the herbicide treatments caused important injury to sunflower and none caused any stand reduction. Wild mustard control exceeded 75% with R-40244, oxyfluorfen, chloramben, linuron, or promtryn as a component of the herbicide treatment. Acetachlor plus chloramben, propachlor, plus R-40244 or linuron, and metolachlor plus promtryn all gave 75% or more control of green and yellow foxtail, wild mustard, kochia. The highest wild mustard and kochia control was with R-40244 a 1 lb/A. Observatins indicated that weed control with all herbicides was better in furrows than on the ridges left from seedbed preparation. The herbicides may have been blown off the ridges with the dry soil prior to the first rain accounting for the lower weed control on the ridges.

Postemergence weed control in sunflower, Casselton 1981. 894 hybrid sunflower was seeded to a silty clay soil with 7.5 pH and 5.5% organic matter, May 11. Treatment 1 through 4 were applied on June19 before a light rain interrupted treatment application. Treatments 5 through 12 were applied on June 20 when the sunflower had 6 to 8 leaves, wild mustard was 4 to 6 inches tall, and green and yellow foxtail had 2 to 4 leaves and the temperature was 65F and relative humidity 80%. Treatments were applied in 8.5 gpa at 35 psi to a 7ft strip the length of 10 by 30ft plots. Soil moisture was adequate and 0.4 inches of r rain occurred on June 21. Sunflower injury and weed control evaluations were on July 13. Sunflowers were not harvested because of a midge infest.

Treatment	Rate oz/A	Sunflower %ir	%sr	---Percent Fxtl	Wimu	control--- Colq	Kocz
BAS-9052	3	0	0	100	0	0	0
BAS-9052+OC	3	0	0	100	0	0	0
BAS-9052+R-40244	3+2	25	0	96	100	80	89
BAS-9052+R-40244	3+4	21	0	95	100	86	96
BAS-9052+MC-10978	3+4	50	0	95	100	84	68
BAS-9052+Desmedipham	3+20	15	0	89	89	75	33
Diclofop	16	0	0	93	0	0	0
Diclofop+MC-10978	16+4	40	0	21	100	79	85
Diclofop+R-40244	16+4	39	0	83	100	80	93
MC-10978	2	25	0	9	98	68	38
MC-10978	4	39	0	18	100	80	55
Acifluorfen	4	50	0	8	100	84	81
Mean		25	0	67	74	60	53
High mean		50	0	100	100	86	96
Low mean		0	0	8	0	0	0
Coeff. of variation		25	0	9	5	11	19
LSD(1 Percent)		12	0	11	8	13	19
LSD(5 Percent)		9	0	8	6	10	14
No. of reps		4	4	4	4	4	4

Summary

Sunflowers were injured by all herbicide treatments which were for broadleaf weed control. However none of the herbicide caused any sunflower stand reduction. Desmedipham was the least injurious of the herbicides for broadleaf control. R-40244 controlled wild mustard and kochia, and MC-10978 wild mustard, but all caused moderate injury to sunflower. Acifluorfen (Rohm and Haas) injured sunflower and controlled kochia more than MC-10978 (acifluorfen from mobil). Foxtail control with diclofop applied with MC-10978 was reduced compared to control with diclofop alone. However, diclofop applied with MC-10978 did not influence sunflower injury. Desmedipham applied in combination with BAS-9052 reduced foxtail control compared with BAS-9052 alone. The rain which occurred immediately after application of the first four treatments did not influence weed control.

Weed control in sunflower, Absaraka 1981. Preplant field cultivator plus harrow twice incorporated herbicides (PPI) were applied, 894 sun flower seeded, and preemergence herbicides (PE) applied to a sandy loam soil with 7.3 pH and 4% organic matter, May 4. Soil surface 3 inches was dry and the first rain was 2.2 inches on May 22-23. Weed control and sunflower injury evaluations were on June 11. Herbicides were applied in 17 gpa at 35 psi to a 7ft width of 10 by 30 ft plots.

Treatment	Rate lb/A	Sunflower %ir	Sunflower %sr	Percent control Colq	Percent control Fxtl	Percent control Wimu
EPTC PPI	3	0	8	81	91	0
EPTC+R-40244 PPI	3+0.5	0	0	97	96	95
Trifluralin PPI	0.75	0	0	82	88	20
Trifluralin+Metribuzin-W PPI	0.75+0.25	14	40	88	83	98
Trifluralin+Metr-W PPI+PE	0.75+0.25	16	16	88	85	50
Trifluralin+Prometryn PPI	0.75+1.5	2	0	80	88	0
Trifluralin+Prometryn PPI+PE	0.75+1.5	1	0	84	88	58
Trifluralin+Linuron PPI	0.75+1.5	1	0	74	85	0
Trifluralin+Linuron PPI+PE	0.75+1.5	0	0	78	85	65
Trifluralin+R-40244 PPI	0.75+0.5	1	0	78	81	100
Trifluralin+R-40244 PPI+PE	0.75+0.5	0	0	95	94	85
Mean		3	6	84	87	52
High mean		16	40	97	96	100
Low mean		0	0	74	81	0
Coeff. of variation		98	170	10	6	0
LSD(1 Percent)		6	19	16	11	0
LSD(5 Percent)		5	14	12	8	0
No. of reps		4	4	4	4	1

Summary

The objective of the research was to determine sunflower tolerance and wild mustard control with various herbicides on coarse texture soil. The wild mustard only occurred in one replication and was too variable for precise control evaluations. Sunflower was tolerant to R-40244 at 0.5 lb/A, but injured by metribuzin at 0.25 lb/A. Metribuzin reduced sunflower stand more when applied preplant incorporatd than preemergence.

Weed control in sunflower, Carrington 1981. Preplant (PPI) treatments were applied and rototiller incorporated on June 9. Cargill 204 sunflower was seeded on June 10 and preemergence (PE) treatments applied on June 16. Weed control and sunflower injury evaluation was on August 3.

Treatment	Rate lb/A	-Sunflower- %ir	%sr	--Percent Fxtl	control-- Rrpw	Colq
EPTC PPI	2.5	0	0	89	65	85
EPTC+R-40244 PPI	2.5+0.5	0	0	82	88	93
Trifluralin PPI	0.75	0	0	95	96	88
Profluralin PPI	0.75	0	0	85	93	78
Pendimethalin PPI	1	2	0	88	93	94
Trifluralin+Linuron PPI	0.75+1.5	2	0	94	99	97
Trifluralin+Prometryn PPI	0.75+1.5	3	0	93	97	96
Trifluralin+Chloramben PPI	0.75+1.5	7	0	96	98	98
Trifluralin+Chloramben PPI	0.75+2	3	3	99	100	100
Chloramben PE	2	0	0	43	70	50
Alachlor PE	2.5	0	0	76	73	53
Metolachlor PE	2.5	0	0	65	80	42
Pendimethalin PE	1	0	0	45	57	63
Propachlor PE	5	2	0	55	50	53
Propachlor+R-40244 PE	3+0.5	0	0	81	93	97
Propachlor+Linuron PE	3+1.5	0	0	87	98	96
Propachlor+Prometryn PE	3+1.5	7	0	97	100	100
Control Weedfree		0	0	70	92	88
Control Weedy		0	0	0	0	0
Mean		1	0	76	81	77
High mean		7	3	99	100	100
Low mean		0	0	0	0	0
Coeff. of variation		271	755	14	25	32
LSD(1 Percent)		8	3	24	44	54
LSD(5 Percent)		6	2	18	33	41
No. of reps		3	3	3	3	3

Summary

All preplant soil incorporated treatments and propachlor with R-40244, linuron, or prometryn preemergence gave commercially acceptable control of all weeds without important sunflower injury.

Weed control in sunflower, Langdon 1981. Preplant (PPI) herbicides applied and field cultivator incorporated twice, Cargill 205 sunflower seeded and preemergence (PE) herbicide treatments applied on June 8. Postemergence (P) treatments were applied to cotyledon to 2 leaf sunflower, 1.5 to 2leaf wild oat and 0.5 to 1 in. foxtail on June 24 with 65F, partly cloudy sky, and 10 to 20 mph north wind.

	Rate	Sunflower		------Percent	control------			
Treatment	lb/A	%ir	%sr	Fxtl	Rrpw	Prpw	Colq	Vwht
EPTC PPI	2.5	3	0	93	64	35	76	84
EPTC+R-40244 PPI	2.5+0.5	0	0	94	88	78	84	79
Trifluralin PPI	0.75	0	1	96	98	98	96	54
Profluralin PPI	0.75	0	0	95	92	90	92	41
Pendimethalin PPI	1	0	0	89	93	91	88	34
Trifluralin+Linuron PPI	0.75+1.5	0	0	97	100	99	100	69
Trifluralin+Prometryn PPI	0.75+1.5	1	0	84	98	96	96	48
Trifluralin+Chloramben PPI	0.75+1.5	1	0	98	100	100	99	66
Trifluralin+Chloramben PPI	0.75+2	4	3	99	99	100	99	65
Chloramben PPI	2	0	0	86	93	88	94	36
Chloramben PE	2	3	1	93	96	95	95	30
Alachlor PE	2.5	0	0	86	81	78	76	20
Metolachlor PE	2.5	0	0	90	81	84	85	10
Pendimethalin PE	1	0	0	56	81	88	91	0
Propachlor PE	5	0	0	78	29	21	48	0
Propachlor+R-40244 PE	3+0.5	0	0	73	85	70	88	0
Propachlor+Linuron PE	3+1.5	0	0	89	96	91	92	39
Propachlor+Prometryn PE	3+1.5	1	0	83	97	98	94	48
Propachlor+Desmedipham PE+P	3+1.5	9	1	79	96	93	94	5
Bas-9052 P	0.2	0	0	71	0	0	0	94
Bas-9052+R-40244 P	0.2+0.2	5	0	79	80	85	84	94
Diclofop P	1	3	0	33	0	0	0	0
Mean		1	0	84	79	76	80	42
High mean		9	3	99	100	100	100	94
Low mean		0	0	33	0	0	0	0
Coeff. of variation		247	506	16	12	14	13	31
LSD(1 Percent)		6	3	25	18	20	19	24
LSD(5 Percent)		5	2	19	13	15	14	18
No. of reps		4	4	4	4	4	4	4

Summary

Volunteer wheat was only controlled by EPTC and BAS-9052 treatments. Propachlor preemergence alone only controlled foxtail, but broadleaf weeds and foxtail were controlled when applied with R-40244, linuron, or prometryn. Desmedipham and R-40244 postemergence gave 80% or more control of broadleaf weeds but caused slight injury to sunflower.

Weed control in sunflower, Williston 1981. Interstate 894 hybrid sunflower was over seeded and thinned to 18,000 plants/A. The experimental area was fallowed in 1980. Preplant treatments (PPI) were applied and incorporated twice with a Triple K implement on May 8 with 48 F, 80% R.H., northeast wind at 10 mph, and moist soil surface conditions. Preemergence treatments (PE) were applied at 8.6 gpa (normally 17) on May 11 with 40 F, 49% R.H., north wind at 4 mph, and dry surface soil. Postemergence (P) treatments were applied to four leaf sunflower, five leaf wild oat, 2 to 3 in. Russian thistle and other weeds less than 2in. on June 11 with 64 F, 72% R.H. and no wind. Harvest was from a 40 sq. ft area on September 23.

Treatment		Rate lb/A	-----Sunflower----- Yield lb/A	Twt lb/bu	%sr	%ir	-------Percent control------- Tymu	Rrpw	Ruth	Grft	Vwht	Wioa
EPTC	PPI	2.5	558	32.6	2	0	82	28	10	97	90	88
EPTC+R-40244	PPI	2.5+0.5	543	31.8	0	3	99	87	30	93	79	83
Trifluralin	PPI	.75	1048	32.5	0	0	0	95	87	98	53	83
Profluralin	PPI	.75	658	32.1	0	0	0	93	57	93	62	65
Pendimethalin	PPI	1.0	557	32.8	0	0	10	93	55	97	70	80
Trif+Linuron	PPI	.75+1.5	825	32.4	0	0	90	95	85	96	85	88
Trif+Prometryn	PPI	.75+1.5	855	33.0	2	2	47	95	82	96	75	83
Trif+Chloramben	PPI	.75+1.5	854	32.8	0	0	60	93	90	98	83	88
Trif+Chloramben	PPI	.75+2.0	1010	32.8	0	0	88	95	95	99	65	92
Chloramben	PPI	2.0	746	32.7	0	2	80	78	87	87	20	47
Chloramben	PE	2.0	872	32.6	0	2	10	90	87	88	0	52
Alachlor	PE	2.5	403	33.1	0	2	40	95	13	95	17	53
Metolachlor	PE	2.5	659	31.9	0	0	53	32	25	87	30	23
Pendimethalin	PE	1.0	547	32.5	0	0	0	37	37	70	7	25
Propachlor	PE	5.0	395	33.2	0	0	0	0	0	55	0	0
Prcl+Prometryn	PE	3.0+1.5	464	33.0	0	2	83	90	52	82	0	10
Prcl+Desmedipham	PE+P	3.0+1.5	470	32.3	2	20	92	88	80	93	47	45
BAS-9052	P	.2	497	32.7	0	10	0	0	0	95	95	95
BAS-9052+R-40244	P	.2+0.2	805	32.5	0	30	100	97	83	98	99	98
Diclofop	P	1.0	568	32.2	0	3	0	0	0	97	0	95
Control weedfree			1203	33.4	0	0	100	100	100	99	87	100
Control weedy			495	32.7	0	0	0	0	0	0	0	0
Mean			683	32.6	0	3	47	67	52	87	48	63
High mean			1203	33.4	2	30	100	100	100	99	99	100
Low mean			395	31.8	0	0	0	0	0	0	0	0
Coeff. of variation			22	0.	446	132	40	22	33	8	36	21
LSD(1 Percent)			327	0.	2	10	40	32	37	16	38	29
LSD(5 Percent)			246	0.	2	7	30	24	28	12	28	22
No. of reps			3	1.0	3	3	3	3	3	3	3	3

Summary

The EPTC+R-40244 treatment solution appeared cloudy and rust colored indicating a possible reaction during storage of the mixed herbicide formulation prior to the addition of water. Linuron was more effective than prometryn for tame yellow mustard and chloramben at 2 lb/A also more effective than at 1.5lb/A incorporated. R-40244 preplant incorporated or postemergence, controlled yellow mustard. R-40244 postemergence injured sunflower, but the yield was similar as with other treatments. Sunflower yield was reduced 707 lb/A when weeds were not controlled from 1202 lb/A for weedfree sunflower.

Weed control in irrigated sunflowers, Karlsruhe 1981. Preplant (PPI) treatments were applied and incorporated with a rototiller, Sakota 5000 Hybrid sunflowers seeded and preemergence (PE) treatments applied May 20. Diclofop was applied postemergence (P) to 1 inch foxtail and sunflowers on June 10. Following application of the PE treatments 0.5 inch of irrigation water was applied. Herbicides were applied with a bicycle wheel plot sprayer delivering 17 gpa for PE and 8.5 gpa at 35 psi for post treatments. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were heavy.

		-----Sunflower-----			---%	control---	
Treatment	Rate lb/A	Yield lb/A	Twt lb/bu	Plt/A 1000X	Grft	Colq	Ruth
Trifluralin PPI	0.75	2304	31.5	19.8	98	97	97
Profluralin PPI	0.75	2352	31.0	15.5	91	85	86
EPTC PPI	3	1746	32.0	16.9	70	50	0
Chloramben PPI	2.5	1476	32.0	14.9	43	60	45
Alachlor PPI	2.5	1614	30.5	16.4	33	38	13
Propachlor PE	4	1248	31.0	18.5	48	25	0
Trifluralin+Diclofop PPI+P	0.75+1	1734	32.0	16.9	99	0	0
Control Handweed		1908	31.0	15.5	99	99	99
Control Weedy		894	30.5	14.5	0	0	0
Mean		1697	31.3	16.6	64	50	38
High mean		2352	32.0	19.8	99	99	99
Low mean		894	30.5	14.5	0	0	0
Coeff. of variation		21	0.	17.3	21	38	46
LSD(1 Percent)		704	0.	5.7	27	37	34
LSD(5 Percent)		519	0.	4.2	20	28	25
No. of reps		4	1.0	4.0	4	4	4

Summary

Grass and broadleaf weed control was good with profluralin or trifluralin and foxtail control good with diclofop. All treatments except propachlor significantly increased sunflower yields compared to the non-treated control.

Weed control in corn, Casselton 1981. An experiment was conducted to evaluate various herbicides for weed control in corn. Preplant treatments were applied and field cultivator plus harrow incorporated twice (PPI), 'Agsco 2XA1' corn was seeded and preemergence treatments (PE) applied on May 12. The experiment was a randomized complete block with four replications and was extablished on a Fargo silty clay with 7.5 pH and 5.0% organic matter. Spike post treatments were applied to corn with less than one leaf on May 27 and post treatments to 3 to 4 leaf corn and 2 leaf yellow foxtail on June 10. PPI treatments were applied in 17 gpa and post in 8.5 gpa at 35 psi to a 7 ft strip the length of 10 by 25 ft plots. The first rain after PPI applications was 2.2 inch on May 22-24, after spike 0.5 inch on May 27-31, and after post 0.6 inch on June 13. Weed control and corn injury (%ir) were evaluated on June 30.

Treatment	Rate lb/A	---Corn--- %ir	%sr	-----Percent control----- Fxtl	Wimu	Kocz	Rrpw
EPTC&R PPI	4	0	0	80	50	38	46
EPTC&R PPI	6	0	0	95	66	49	60
Butylate&R+Cyan-L PPI	3+2	0	0	73	84	86	86
Vernolate&R PPI	4	0	0	74	46	30	46
Cyanazine-L PPI	2	0	0	34	79	80	31
Alachlor+Cyanazine-L PPI	2.5+2	0	0	65	75	78	71
Metolachlor+Cyanazine-L PPI	2.5+2	0	0	76	74	73	75
Cyanazine-L PE	2	3	0	35	60	69	43
Propachlor PE	5	0	0	79	56	65	59
Alachlor PE	3	0	0	73	38	25	35
Metolachlor PE	3	0	0	80	28	24	39
Alachlor+Atrazine-L PE	2.5+2.0	0	0	66	93	88	91
Metolachlor+Atrazine-L PE	2.5+2.0	0	0	73	88	88	77
Alachlor+Cyanazine-L PE	2.5+2.0	0	0	75	86	86	76
Metolachlor+Cyanazine-L	2.5+2.0	0	0	61	79	70	60
Alachlor+Dicamba PE	2.5+0.5	5	0	55	69	84	81
Acetochlor PE	1.75	0	0	84	63	60	66
Pendimethalin 4E PE	2.0	0	0	35	45	66	75
Pendimethalin-DF PE	2.0	0	0	26	40	60	70
Pend 4E+Cyanazine-W PE	1.5+2.4	5	0	46	60	74	73
Pend-DF+Cyanazine-W PE	1.5+2.4	5	0	43	79	91	78
Atrazine-L+LOTM post	1.5+.25G	0	0	90	99	97	99
Cyanazine-W+LOTM post	1.5+.25G	18	0	83	97	98	98
Pendimethalin 4E spike post	2.0	0	0	43	93	96	94
Pendimethalin-DF spike post	2.0	0	0	53	95	95	96
Pend 4E+Cyan-W spike post	1.5+2.4	3	0	65	93	96	96
Pend-DF+Cyan-W spike post	1.5+2.4	3	0	70	94	97	96
Dicamba spike post	0.37	0	0	3	85	96	96
Dicamba post	0.37	10	0	0	98	97	98
Control		0	0	0	0	0	0
Mean		2	0	58	70	72	70
High mean		18	0	95	99	98	99
Low mean		0	0	0	0	0	0
Coeff. of variation		199	0	21	15	15	15
LSD(1 Percent)		6	0	23	19	20	19
LSD(5 Percent)		5	0	17	14	15	14
No. of reps		4	4	4	4	4	4

Summary

None of the treatments caused any corn stand reduction. Postemergence herbicides generally gave better broadleaf weed control than PPI or PE applied herbicides. Acetochlor at 1.75 lb/A gave better weed control than alachlor or metolachlor at 3 lb/A.

Weed control in corn, Richland County 1981. The experiment was conducted on a sandy loam, C.Hendrickson farm Colfax, ND. Thor-o bred 280 hybrid corn was planted on May 2 and preemergence (PE) treatments applied, May 4. The spike treatments were applied to 1-leaf corn and weeds less than 1.5 in May 18, and post treatments to 4 to 5-leaf corn, 2 to 4-leaf foxtail and broadleaf weeds less than 3 in, June 10. Corn injury and weed control were evaluated on July 2.

Treatment	Rate lb/A	----Corn--- %ir	%sr	--Percent Fxtl	control-- Colq	Rrpw
Cyanazine-L PE	2	8	4	79	84	88
Propachlor PE	5	0	0	65	45	58
Alachlor PE	3	0	0	86	38	60
Metolachlor PE	3	3	0	80	73	75
Alachlor+Atrazine-L PE	2.5+2.0	0	0	95	97	96
Metolachlor+Atrazine-L PE	2.5+2.0	3	0	91	95	95
Alachlor+Cyanazine-L PE	2.5+2.0	3	0	82	77	86
Metolachlor+Cyanazine-L	2.5+2.0	3	0	81	90	92
Alachlor+Dicamba PE	2.5+0.5	8	0	84	92	92
Acetochlor PE	1.75	0	0	61	56	56
Pendimethalin 4E PE	2.0	0	0	66	75	81
Pendimethalin-DF PE	2.0	5	0	74	84	81
Pend 4E+Cyanazine-W PE	1.5+2.4	15	0	82	94	94
Pend-DF+Cyanazine-W PE	1.5+2.4	18	0	82	89	91
Atrazine-L+LOTM post	1.5+.25G	15	0	76	87	88
Cyanazine-W+LOTM post	1.5+.25G	19	0	92	94	95
Pendimethalin 4E spike post	2.0	3	0	71	85	86
Pendimethalin-DF spike post	2.0	10	0	78	90	86
Pend 4E+Cyan-W spike post	1.5+2.4	25	15	86	93	93
Pend-DF+Cyan-W spike post	1.5+2.4	13	0	90	94	93
Dicamba spike post	0.37	0	0	18	58	65
Dicamba post	0.37	8	0	25	85	91
Control		0	0	0	0	0
Mean		7	1	71	77	80
High mean		25	15	95	97	96
Low mean		0	0	0	0	0
Coeff. of variation		110	782	16	16	13
LSD(1 Percent)		14	12	21	23	20
LSD(5 Percent)		10	9	16	17	15
No. of reps		4	4	4	4	4

Summary

Corn was moderately injuryed by treatments with cyanazine at 2.4 lb/A PE and by all spike and post treatments other than dicamba or pendimethalin 4E. Redroot pigweed control was good with all treatments except propachlor, alachlor, metolachlor, and acetachlor applied alone. Common lambsquarters control was generally lower in treatments with alachlor than with metolachlor. Foxtail control generally exceeded 75% except for with propachlor, Acetachlor, certain pendimethalin treatments, and dicamba.

Weed control in irrigated corn, Karlsruhe 1981. Preplant (PPI) treatments were applied and incorporated with a rototiller, NK 111 hybrid corn seeded and preemergence (PE) treatments applied May 20. Following herbicide application 0.5 inch of irrigation water was applied. 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 8 by 20 ft. Weed densities were heavy.

		--------Corn-------			----Percent		control----		
Treatment	Rate lb/A	Yield Bu/A	Twt lb/bu	Plt/A 1000X	Grft	Wibw	Colq	Ruth	Wisu
EPTC+R-25788 PPI	3	102.3	51.0	12.3	75	35	55	0	0
Pendimethalin PE	1.5	118.4	51.0	12.4	71	55	94	35	0
Alachlor+Linuron PE	1.5+0.75	124.3	50.5	13.8	92	60	73	35	0
Alachlor+Dicamba PE	2+0.25	109.2	50.0	13.1	81	30	53	53	18
Alachlor+Cyanazine-W PE	1+2	125.0	51.0	13.5	89	96	99	99	98
Propachlor PE	5	110.4	50.0	14.7	90	0	18	0	0
Alachlor+Propachlor PE	1.5+2	104.4	51.0	13.7	94	23	60	5	5
Control Handweeded		101.6	50.0	13.8	99	99	99	99	99
Control Weedy		88.8	50.0	13.6	0	0	0	0	0
Mean		109.4	50.5	13.4	77	44	61	36	24
High mean		125.0	51.0	14.7	99	99	99	99	99
Low mean		88.8	50.0	12.3	0	0	0	0	0
Coeff. of variation		25.6	0.	15.1	18	39	29	56	48
LSD(1 Percent)		55.4	0.	4.0	28	34	35	40	23
LSD(5 Percent)		40.9	0.	3.0	21	25	26	29	17
No. of reps		4.0	1.0	4.0	4	4	4	4	4

Summary

Alachlor plus cyanazine provided excellent control of all weed species. Corn populations were variable and not related to injury.

Weed control in soybean, NW-22 Fargo 1981. Preplant treatments (PPI) were applied and twice incorporated with a field cultivator plus harrow to silty clay soil with a 7.4 pH and 6% organic matter and dry to 3 inches May 19. 'Evans' soybean was seeded and preemergence (PE) treatments were applied also on May 19. Postemergence (P) herbicides were applied during 73F and 70% relative humidity to second trifoliate soybean, three to four leaf wild oat and two to four leaf green and yellow foxtail, 0 to 4 inch redroot pigweed, 1 to 6 inch wild mustard, and 4 inch kochia with excellent conditions for growth, June 22. PPI and PE treatments were in 17 gpa and P in 8.5 gpa both were at 35 psi to a 7 ft strip the lenght of 10 by 25 ft plots. Rainfall was 3.3 in within 5 days after preemergence treatment and 0.5 in within 1 day after postemergence treatment. Soybean injury and weed control evaluation was on July 13.

Treatment	Rate oz/A	Soybean %ir	Soybean %sr	----Percent control---- Wioa	Fxtl	Wimu	Kocz	Rrpw
Trifluralin+Metribuzin-W PPI	16+2	6	0	87	95	96	88	93
Trifluralin+Metribuzin-W PPI	16+4	7	0	85	92	92	86	89
Pendimethalin+Metribuzin-W PPI	16+2	2	0	88	93	90	86	87
Pendimethalin+Metribuzin-W PPI	16+4	0	3	89	92	98	94	98
Trifluralin+DNBP PPI+P	16+24	3	2	87	93	83	94	88
Trifluralin+Napt&DNBP PPI+P	16+48	2	0	87	95	87	92	93
Trifluralin+Bentazon PPI+P	16+12	7	0	92	94	94	91	89
Trifluralin+MC-10978 PPI+P	16+8	3	1	94	97	98	91	99
Trifluralin+Acifluorfen PPI+P	16+8	8	2	91	96	97	98	98
Trif +MC-10978+Bentazon PPI+P	16+4+8	11	0	89	94	98	87	96
BAS-9052+OC P	3+0.25G	0	0	99	99	0	0	0
BAS-9052+Acifluorfen P	3+8	9	0	97	87	99	88	88
BAS-9052+MC-10978 P	3+8	7	0	95	88	68	73	73
BAS-9052 P	3	0	0	98	96	0	0	0
Control		0	0	0	0	0	0	0
Mean		4	1	85	87	73	71	73
High mean		11	3	99	99	99	98	99
Low mean		0	0	0	0	0	0	0
Coeff. of variation		127	369	6	4	19	10	9
LSD(1 Percent)		12	4	12	9	31	17	15
LSD(5 Percent)		9	3	9	6	23	12	11
No. of reps		3	3	3	3	3	3	3

Summary

Wild oat and foxtail control exceeded 85% with all treatments. Acifluorfen or MC-10978 in combination with BAS-9052 reduced wioa and foxtail control compared to BAS9052 alone. The oil additive did not enhance grass weed control with BAS-9052. Wild mustard control was good with all broadleaf herbicides for broadleaf weeds. Metribuzin PPI at 2 oz/A controlled wild mustard. MC-10978 the acifluorfen formulation by mobil was less effective in controlling broadleaf weeds than acifluorfen by Rhom Haas. Observation in part of the experiment indicated than marshelder wasn't controlled by trifluralin and that dinoseb + napthalam gave 70% marshelder control, but marshelder was not controlled with dinoseb alone.

Preemergence weed control in pinto bean, NW-22 Fargo 1981. Preplant treatments (PPI) were applied to a silty clay soil dry to 3 inches and with 7.5% pH and 6% organic matter, and field cultivator plus harrow incorporated twice, May 19. 'VI 111' pinto bean was seeded and preemergence (PE) treatments applied, May 20. Herbicides were applied in 17 gpa at 35 psi to a 7ft strip the lenght of 10 by 30ft plots. The first after treatment rains of 3.3 inchs occurred on May 22 to 24. Pinto bean injury and weed control were evaluated on July 16.

Treatment	Rate lb/A	Pinto beans %ir	Pinto beans %sr	--Percent control-- Wioa	Fxtl	Kocz	Wimu
EPTC PPI	2.2	0	0	93	96	13	21
EPTC PPI	3.3	3	0	96	98	29	26
EPTC+Fluchloralin PPI	2.2+1	1	0	94	99	94	25
EPTC+Vernolate PPI	2+2	0	0	94	97	10	23
Fluchloralin PPI	1	3	0	71	93	83	8
Trifluralin PPI	1	0	3	83	97	90	0
Profluralin PPI	1	0	3	78	93	75	0
Trif+EPTC+Chloramben PPI	1+2.6+3	16	6	98	99	94	81
Vernolate PPI	3	0	0	91	96	0	41
Alachlor PE	3	0	0	24	75	15	5
Alachlor PE	4	0	0	35	74	26	0
Metolachlor PE	3	0	0	11	64	0	0
Metolachlor PE	4	0	0	49	81	5	10
Acetachlor	2.25	4	4	61	89	60	43
Chloramben PE	3	0	0	33	76	78	35
Metribuzin-W PE	0.25	0	4	25	71	51	66
Metribuzin-W PE	0.5	36	58	75	81	83	84
Control		0	0	0	0	0	0
Mean		3	4	62	82	45	26
High mean		36	58	98	99	94	84
Low mean		0	0	0	0	0	0
Coeff. of variation		106	86	26	10	36	71
LSD(1 Percent)		7	7	30	15	30	35
LSD(5 Percent)		5	5	23	11	22	26
No. of reps		4	4	4	4	4	4

Summary

Metribuzin at 0.5 lb/A caused severe injury and stand reduction in pinto bean, but 0.25 lb/A only tended to reduce stand. Wild mustard control only exceeded 80% with metribuzin at 0.5 lb/A and chloramben at 3 lb/A incorporated with trifluralin and EPTC. Chloramben at 3 lb/A surface applied only gave 35% wild mustard control. Wild oats control exceeded 90% with all treatments which contained EPTC or vernolate. Kochia control exceeded 80% for all treatments with trifluralin or fluchloralin.

Postemergence weed control in pinto bean, NW-22 Fargo 1981. 'VI 111' pinto bean was seeded to silty clay soil with 7.5 pH and 6% organic matter on May 20. Herbicides were applied in 8.5 gpa at 35 psi to 2nd trifoliolate pinto bean, 6 inch wild mustard and kochia, three to four leaf wild oat and 3 to 6 in yellow foxtail on June 25. Soil moisture was excellent for plant growth and conditions during treatment were 73F and 50% relative humidity. Treatments were to a 7ft strip the length of 10 by 30ft plots. Two days after treatment 0.3 inches of rain occurred. Pinto bean injury and weed control evaluations were on July 16.

Treatment	Rate oz/A	Pinto bean %ir	Pinto bean %sr	--Percent control-- Wioa	Yeft	Kocz	Wimu
Bentazon+Acifluorfen	12+4	11	0	23	23	88	100
Bentazon+Acifluorfen	12+2	4	0	0	15	85	100
Bentazon+MC-10978	12+2	1	0	0	0	66	100
Bentazon+MC-10978	8+2	4	0	0	0	53	100
Bentazon+MC-10978	4+4	6	0	4	8	44	100
Bentazon+MC-10978	4+8	13	0	15	16	65	100
Bentazon	12	0	0	0	0	78	100
Acifluorfen	4	5	0	5	5	43	100
Acifluorfen	8	13	0	41	13	60	100
MC-10978	4	0	0	0	0	4	98
MC-10978	6	3	0	11	0	11	100
MC-10978	8	5	0	13	6	44	99
MO-70077 (2.0E)	16	23	15	15	25	53	94
MO-70077-0.78E	16	26	13	14	21	45	93
BAS-9052+OC	1.6+0.25G	0	0	99	100	0	0
BAS-9052+OC	3.2+0.25G	0	0	100	100	0	0
BAS-9052+OC	4.8+0.25G	0	0	100	100	0	0
BAS-9052+Bent+OC	3.2+12+0.25G	4	1	50	69	90	99
BAS-9052+MC-10978	3.2+6	0	0	80	83	38	99
BAS-9052+MO-70077	3.2+16	25	8	93	93	39	99
BAS-9052+Napt&Dinoseb	3.2+48	15	0	71	33	39	100
Napt&Dinoseb	48	11	0	0	0	5	98
Dinoseb	24	0	0	0	0	10	100
Mean		7	2	32	31	42	86
High mean		26	15	100	100	90	100
Low mean		0	0	0	0	0	0
Coeff. of variation		133	513	45	65	38	3
LSD(1 Percent)		18	15	27	37	30	4
LSD(5 Percent)		14	11	20	28	22	3
No. of reps		4	4	4	4	4	4

Summary

MO-70077 injured pinto bean. Wild mustard was controlled effectively by all herbicides except BAS-9052 applied alone. BAS-9052 at 1.6 to 4.8 oz/A controlled wild oat and foxtail. However, foxtail and wild oat control with BAs-9052 was or tended to be reduced when applied with a herbicide for broadleaf control. Reduction in gras weed control was greater when BAS-9052 was mixed with bentazon and napthalam+dinoseb than with MC-10978 or MO-70077. Bentazon tended to give higher kochia control than acifluorfen at the rate used.

Weed control in safflower, Williston 1981. Preplant incorporated (PPI) herbicides were applied and incorporated first with cultivator with harrow and second with a Triple K, and Hartman safflower seeded at 25 lb/A on May 5 with 56 F, 30% R.H., and a 16 mph east wind. Preemergence (PE) herbicides were applied on May 8 with 49 F, 80% R.H., and a 3 mph northeast wind. Postemergence (P) herbicides were applied to 4 to 6 leaf safflower, 3 to 4.5 leaf wild oat, 1 to 3 leaf green foxtail, and 1 to 2 in. Russian thistle on June 6 with 64 F, 60% R.H., and a 3 mph southeast wind. The experiment was on fallow which was broadcast fertilized with 75 lb/A N. Harvest was from 84 sq. ft area on Sept. 14. Weed infestation sparse with wild oat and Russian thistle the major weeds.

Treatment		Rate	---Safflower---			---------Percent		control---------				
		lb/A	Yield lb/A	%sr	%ir	Tymu	Rrpw	Fipc	Ruth	Grft	Vwht	Wioa
Trifluralin	PPI	.75	682	0	1	0	96	0	76	95	75	78
Trifluralin	PPI	1.0	780	0	0	0	96	0	79	97	66	89
Trif+Bifenox	PPI+PE	.75+.5	777	8	1	68	98	13	97	98	65	79
Trif+Alachlor	PPI+PE	.75+2	743	4	0	13	96	21	80	98	49	88
Bifenox+Alachlor	PE	1.5+2	606	4	3	94	96	24	97	93	13	30
Ethalfluralin	PPI	1.0	811	0	0	8	96	48	89	97	76	85
Trif+Triallate	PPI	.75+1.0	686	0	0	0	95	18	69	96	55	85
Trif+Dinoseb	PPI+P	.75+2	312	81	95	100	99	24	81	96	66	53
Trif+2,4-DB	PPI+P	.75+.375	791	1	6	66	89	48	80	95	61	83
Trifluralin+EPTC	PPI	.75+2	756	3	0	43	90	18	73	99	96	90
EPTC	PPI	3.0	745	4	0	55	81	46	11	98	99	95
Profluralin	PPI	.75	497	0	0	0	83	23	60	90	59	50
Pendimethalin	PPI	1.0	599	0	0	13	95	24	55	94	64	71
Metolachlor	PPI	3.0	517	0	0	28	84	0	20	93	71	18
Pendimethalin	PE	1.25	513	0	0	25	55	0	15	70	15	10
Trif+Linuron	PPI	.75+1.5	692	0	0	66	95	41	75	96	69	70
Pend+Linuron	PE	1+1.5	482	0	1	86	95	13	46	89	6	25
BAS-9052+OC	P	.2+.25G	546	0	0	0	0	0	0	91	85	85
BAS-9052+OC	P	.4+.25G	683	0	1	0	0	0	0	93	91	90
Pend+Oxyfluorfen	PE	1+1	410	30	97	100	98	25	95	99	93	89
Trif+Acifluorfen	PPI+P	.75+.37	594	1	54	94	91	18	83	95	55	78
Pend+BAS9+2,4-DB	PE+P	1+.2+.5	683	6	20	80	81	0	68	86	70	70
Pend+Diclofop	PE+P	1+1	682	0	0	8	54	8	25	94	0	97
R-40244+Pend	PE	.25+1	364	0	0	93	92	0	51	68	10	8
Control			276	0	0	0	0	0	0	0	0	0
Mean			609	6	11	41	78	16	57	89	56	64
High mean			811	81	97	100	99	48	97	99	99	97
Low mean			276	0	0	0	0	0	0	0	0	0
Coeff. of variation			22	92	26	37	17	179	21	7	34	24
LSD(1 Percent)			253	10	5	29	24	54	22	11	36	28
LSD(5 Percent)			191	7	4	22	18	41	17	9	27	22
No. of reps			4	4	4	4	4	4	4	4	4	4

Summary

Dinoseb, oxyfluorfen, and acifluorfen caused important safflower stand and height reductions. Safflower height was generally reduced for treatment which caused a stand reduction or injury. R-40244 controlled tame yellow mustard, but not Russian thistle. Bifenox, linuron, 2,4-DB, and R-40244 were the only herbicides with potential for mustard control without severe safflower injury.

Safflower response to BAS-9052 and asulam, Williston 1981. Hartman safflower was seeded at 20 lb/A into soil treated with EPTC at 2 lb/A and Trifluralin at 1 lb/A, April 20. BAS-9052 and asulam were applied with an emusilfiable oil a 1% v/v. Treatments were applied to 8 to 10 leaf safflower (immediately post rosette) on May 22 with 61 F, 67% R.H. and northeast wind at 12 mph. A rain of 0.02 in. occurred in 2 hours after treatment. Asulam was also applied to 14 leaf safflower on June 6. Harvest was a 200 sq. ft safflower area on September 10.

		Safflower		
Treatment	Rate oz/A	Yield lb/A	Twt lb/bu	Height (cm)
BAS-9052	.2	1228	40.0	66
BAS-9052	.4	1183	40.1	74
BAS-9052	.8	1082	40.2	67
BAS-9052+2,4-DB	.2+.75	1241	38.4	54
Control		1118	40.6	74
Mean		1171	39.9	67
High mean		1241	40.6	74
Low mean		1082	38.4	54
Coeff. of variation		11	0.	6
LSD(1 Percent)		362	0.	19
LSD(5 Percent)		249	0.	12
No. of reps		3	1.0	2

Summary

Asulam at 0.75, 1.0, or 1.5 lb/A caused severe injury burn to safflower which recovered somewhat, but no seed was produced so the data was not included in the table. BAS-9052 with 2,4-DB reduced safflower seed test weight and plant height, but not seed yield.

Safflower response to 2,4-DB and chlorsulfuron, Williston 1981. Hartman safflower was seeded at 20 lb/A to a 1980 fallow area, April 20. The area prior to seeding was treated with trifluralin at 1 and EPTC at 2 lb/A for weed control. The treatments were applied to 2 to 4 leaf (rosette) safflower on May 15 with 62 F and 15 mph east wind, and to 8 in. (range 4 to 12 in.) tall saffower with 18 to 20 leaves on June 6 with 58 F, 67% R.H., and no wind. Harvest was 84 sq. ft area of safflower on September 11.

			----------Safflower	----------	----------	----------	----------	----------
Treatment		Rate oz/A	Yield lb/A	Twt lb/bu	Height (cm)	Early %ir	Late %ir	%sr
2,4-DB	rosette	8	1005	39.7	65	15	9	3
2,4-DB	rosette	12	872	40.0	60	18	15	6
2,4-DB	rosette	16	984	40.0	65	16	15	9
Chlorsulfuron	rosette	.25	734	40.5	70	3	5	0
Chlorsulfuron	rosette	.5	1069	40.7	75	0	1	3
Control	rosette		712	40.6	70	0	0	0
2,4-DB	8-in.	8	709	39.7	77	69	43	14
2,4-DB	8-in.	12	492	39.4	75	88	55	29
2,4-DB	8-in.	16	348	39.2	80	95	74	43
Chlorsulfuron	8-in.	.25	823	38.6	72	14	4	0
Chlorsulfuron	8-in.	.5	826	40.4	80	14	3	0
Control	8-in.		781	40.4	80	0	0	0
Mean			780	39.9	72	28	19	9
High mean			1069	40.7	80	95	74	43
Low mean			348	38.6	60	0	0	0
Coeff. of variation			18	0.	0	24	35	86
LSD(1 Percent)			269	0.	0	13	13	14
LSD(5 Percent)			201	0.	0	9	9	11
No. of reps			4	1.0	1	4	4	4

Summary

Bromoxynil at 3 oz/A plus MCPA at 3 oz/A and bromoxynil at 6 oz/A gave 100% safflower kill so the data was not included in the table. 2,4-DB was more injurious than chlorsulfuron to safflower and injury from both 2,4-DB and chlorsulfuron was higher with treatment of 8in. than rosette safflower.

Weed control in lentils, Minot 1981. Preplant (PPI) treatments were applied and incorporated with a rototiller, Chilean type lentils seeded and preemergence (PE) treatments applied May 22. Postemergence (P) treatments were applied to 1 inch lentils on June 12. Rainfall for a one week period following PE or P applications totalled 0.7 and 0.9 inch; respectively. Herbicides were applied with a bicycle wheel plot sprayer delivering 17 gpa for PE and 8.5 gpa at 35 psi for post treatments. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed control and crop injury were on July 22.

		--------Lentils--------						
	Rate	Yield	Twt			Percent	control	
Treatment	lb/A	lb/A	lb/bu	%ir	%sr	Grft	Colq	Ruth
Trifluralin PPI	0.75	853	57.5	21	30	98	100	89
Profluralin PPI	0.75	1138	58.0	4	15	95	95	68
Fluchloralin PPI	1	1153	58.2	5	18	97	98	88
Pendimethalin PPI	1	1035	57.8	5	16	95	98	40
EPTC PPI	3	677	57.5	0	1	43	20	0
Propachlor PE	5	1217	58.1	0	3	93	81	46
Alachlor PE	2.5	741	57.5	0	8	93	90	0
Pendimethalin PE	1.5	1166	58.1	4	13	94	89	71
Metribuzin-W PE	0.5	448	57.5	14	68	98	100	88
Propachlor+Metribuzin-W PE	3+0.5	486	57.5	19	69	99	100	86
Propachlor+R-40244 PE	3+0.5	1234	57.9	4	8	94	99	59
Propachlor+Oxyfluorfen PE	3+0.25	1101	57.9	14	21	99	100	99
Diclofop P	1.25	1228	58.0	3	0	95	0	0
Bas-9052+OC P	0.25+.25G	1209	57.5	0	0	100	0	0
Metribuzin-W P	0.25	1305	57.8	5	16	86	100	38
Control		1125	58.1	0	3	0	0	0
Mean		1007	57.8	6	18	86	73	48
High mean		1305	58.2	21	69	100	100	99
Low mean		448	57.5	0	0	0	0	0
Coeff. of variation		26	0.	85	61	15	14	38
LSD(1 Percent)		489	0.	10	21	24	20	35
LSD(5 Percent)		367	0.	7	15	18	15	26
No. of reps		4	1.0	4	4	4	4	4

Summary

Weed densities were light and variable. Lentils were injured over 30% by PPI applications of trifluralin or PE applications of metribuzin alone or in combination with propachlor.

Weed control in lentils, Williston 1981. Preplant incorporated (PPI) applied and incorporated first with a field cultivator with harrow and second with a Triple K rotovator on May 11 with 43 F, 45% R.H., and a 5 mph north wind. Chilian lentils were seeded at 60 lb/A and preemergence (PE) herbicides applied on May 14 with 50 F, 42% R.H., a 3 mph northeast wind, and a dry surface soil condition. Postemergence (P) herbicides were applied to 2 to 3 in. lentils, 3 in. Russian thistle, 4.5 leaf wild oat, and other weeds ¼ 1 in. tall on June 11 with 60 F, 72% R.H. and no wind. The experiment was on fallow which was broadcast fertilized with 70 lb/A N. Harvest was a 60 sq. ft area of lentils on August 27. Yield included some wild oat seed with the lentils, because complete separation was not possible.

			------Lentils------				-------Percent control-------					
		Rate	Yield	Hght								
Treatment		lb/A	lb/A	(cm)	%sr	%ir	Tymu	Ruth	Rrpw	Grft	Vwht	Wioa
Trifluralin	PPI	.75	451	28	9	6	0	66	93	96	36	90
Profluralin	PPI	.75	499	26	3	4	5	59	93	97	38	76
Pend+Metribuzin	PE	1+0.5	6	14	96	98	100	94	91	81	96	95
Pendimethalin	PPI	1	427	28	8	10	33	50	91	97	49	81
EPTC	PPI	3	237	24	9	35	44	5	65	73	73	74
Propachlor	PE	5	106	28	1	0	0	10	23	48	0	13
Alachlor	PE	2.5	160	27	38	40	60	29	91	94	73	76
Pendimethalin	PE	1.5	217	25	3	2	8	35	74	68	8	43
Metribuzin-WP	PE	0.5	273	16	97	99	98	79	80	55	89	95
Propachlor+Metr-W	PE	3+.5	1	9	100	100	100	96	91	77	98	97
Propachlor+R40244	PE	3+.5	154	24	8	6	100	74	94	76	18	40
Prcl+Oxyfluorfen	PE	3+.25	152	17	23	53	97	94	97	85	23	54
Diclofop	P	1.25	315	18	0	3	0	0	0	96	0	96
BAS-9052+OC	P	.25+.25	422	26	0	0	0	0	0	72	98	99
Metribuzin-WP	P	0.25	175	26	3	14	88	65	81	71	0	30
Control			106	29	0	0	0	0	0	0	0	0
Mean			231	23	25	29	46	47	66	74	44	66
High mean			499	29	100	100	100	96	97	97	98	99
Low mean			1	9	0	0	0	0	0	0	0	0
Coeff. of variation			68	16	38	45	34	35	26	29	46	25
LSD(1 Percent)			294	10	18	25	29	31	32	40	38	31
LSD(5 Percent)			221	8	13	18	22	24	24	30	28	24
No. of reps			4	2	4	4	4	4	4	4	4	4

Summary

Metribuzin at 0.5 lb/A caused nearly complete kill of lentils, but only slight stand reduction at 0.25 lb/A. Lentils were not injured or only slightly by the dinitoanalin herbicides, R-40244, propachlor, diclofop, or BAS-9052.

Postemergence grass and broadleaf herbicide antagonism, Fargo 1981. 'Bush manford' sugarbeet, 'Hodgson' soybean, 'Olaf' wheat, 'Culbert' flax, and '894' sunflower were seeded in strips 6 to 10 ft wide in silty clay soil with 7.2 pH and 6% organic matter June 5. Herbicides were applied during 74F in 8.5 gpa at 35 psi across the strips of crops to 4 to 5leaf sugarbeet and wheat, 3 to 6 in flax, first trifoliate soybean, 4 to 8 leaf sunflower and 2 to 5 leaf foxtail and redroot pigweed, June 29. Growing conditions were excellent and rainfall was 0.57 in on July 2 and 0.01 in on July 3. Plots were 8 by 45 ft and the experiment was a split plot with the grass control herbicides as the main plots. Percent injury evaluation was on July 15 and foxtail also on September 15.

Treatment	Rate oz/A	Sube	Wht	Flax	Sobe	Sufl	Rrpw	Wimu	Fxtl	Fxtl Sept
		Percent control								
Bas-9052	1.5	0	20	0	0	0	0	0	82	78
Bas-9052	3	0	91	0	0	0	0	0	97	99
Bas-9052	6	0	99	0	0	0	0	0	99	100
Bas-9052+OC	1.5+0.25G	0	90	0	3	0	0	0	95	98
Bas-9052+OC	3+0.25G	0	99	0	0	30	0	0	100	100
Bas-9052+OC	6+0.25G	0	100	0	0	0	0	0	99	100
Bas-9052+Desm+OC	1.5+16+.25G	7	91	42	12	18	73	100	94	88
Bas-9052+Desm+OC	3+16+0.25G	13	91	32	15	50	86	100	97	90
Bas-9052+Desm+OC	6+16+0.25G	13	98	45	37	57	85	100	99	98
Bas-9052+Bent+OC	1.5+12+.25G	100	28	0	5	96	94	100	77	40
Bas-9052+Bent+OC	3+12+.25G	100	75	5	7	93	97	100	96	55
Bas-9052+Bent+OC	6+12+.25G	100	93	8	12	90	92	100	98	92
Bas-9052+Acif+OC	1.5+6+.25G	92	92	100	12	48	96	100	91	37
Bas-9052+Acif+OC	3+6+.25G	86	98	100	30	52	97	100	96	70
Bas-9052+Acif+OC	6+6+.25G	88	99	70	23	73	99	100	99	88
CGA-82725	1.2	0	0	0	0	0	0	0	13	30
CGA-82725	2.4	0	3	0	0	0	0	0	50	51
CGA-82725	4.8	0	5	0	0	0	0	0	79	78
CGA-82725+OC	1.2+0.25G	0	0	0	0	0	0	0	87	87
CGA-82725+OC	2.4+0.25G	0	13	0	0	0	0	0	93	96
CGA-82725+OC	4.8+0.25G	0	10	0	0	0	0	0	97	90
CGA-82725+Desm+OC	1.2+16+.25G	10	48	35	15	33	80	100	71	27
CGA-82725+Desm+OC	2.4+16+.25G	13	57	48	27	38	91	98	78	47
CGA-82725+Desm+OC	4.8+16+.25G	27	52	38	18	22	87	100	89	77
CGA-82725+Bent+OC	1.2+12+.25G	100	13	0	10	96	92	100	74	25
CGA-82725+Bent+OC	2.4+12+.25G	100	10	0	20	98	93	100	88	58
CGA-82725+Bent+OC	4.8+12+.25G	100	17	0	17	96	91	100	95	74
CGA-82725+Acif+OC	1.2+6+.25G	87	47	100	23	80	96	100	78	13
CGA-82725+Acif+OC	2.4+6+.25G	93	48	100	32	75	98	100	73	17
CGA-82725+Acif+OC	4.8+6+.25G	93	50	100	28	80	96	100	93	45

Table continued next page.

Table . Continued

Treatment	Rate oz/A	Sube	Wht	Flax	Sobe	Sufl	Rrpw	Wimu	Fxtl	Fxtl Sept
		----------------	----	Percent	control	----	----	----------------		
RO-13-8895	3	0	68	0	5	0	10	0	72	77
RO-13-8895	6	0	98	0	0	0	0	0	95	87
RO-13-8895+OC	1.5+0.25G	0	95	0	0	0	0	0	92	95
RO-13-8895+OC	3+0.25G	0	100	0	0	0	0	0	97	97
RO-13-8895+OC	6+0.25G	0	100	3	0	0	0	0	99	96
RO-13-8895+Desm+OC	1.5+16+.25G	3	43	28	13	33	70	100	57	15
RO-13-8895+Desm+OC	3+16+.25G	23	76	42	20	42	48	100	82	75
RO-13-8895+Desm+OC	6+16+.25G	3	92	43	17	40	60	50	84	79
RO-13-8895+Bent+OC	1.5+12+.25G	100	48	10	0	90	93	100	50	0
RO-13-8895+Bent+OC	3+12+.25G	100	95	0	5	96	93	100	75	33
RO-13-8895+Bent+OC	6+12+.25G	100	100	0	13	93	96	100	95	84
RO-13-8895+Acif+OC	1.5+6+.25G	98	62	100	8	63	97	100	60	8
RO-13-8895+Acif+OC	3+6+.25G	91	94	100	28	77	95	100	83	27
RO-13-8895+Acif+OC	6+6+.25G	87	99	98	25	83	97	100	95	50
Mean		42	64	28	11	42	55	60	84	65
High mean		100	100	100	37	98	99	100	100	100
Low mean		0	0	0	0	0	0	0	13	0
Coeff. of variation		21	24	41	82	27	19	18	10	24
LSD(1 Percent)		18	32	25	19	25	22	28	18	33
LSD(5 Percent)		14	25	19	15	19	16	21	14	25
No. of reps		3	3	3	3	3	3	2	3	3

Summary

Desmedipham, bentazon, and acifluorfen all when applied with CGA-82725 or RO-13-8895 and bentazon with BAS-9052 reduced yellow foxtail control. Desmedipham and acifluorfen injury to sunflower and soybean increased or tended to increase as the BAS-9052 rate in the treatment increased. Wheat injury from CGA-82725 increased when desmedipham or acifluorfen were included in the treatment. The difference in foxtail control with the various treatments was excentuated with the September evaluation.

Chlorsulfuron soil residual from 1979, Fargo NW-22 1981. The plot area received chlorsulfuron at 1 to 4oz/A applied at 10 weekly intervals from June 4 to August 6, 1979. Soybeans and sugarbeets were seeded on May 15, 1981 and evaluated for percent stand reduction early in August. The 1979 experiment was a split plot with the rate as the main effect and time of application as the sub units. The area was moldboard plowed in the fall of 1979 and 80. Evaluations were over the main plot and recording the highest and lowest stand reduction for the subplots within the main plot area.

Chlorsulfuron (oz/A)	--------July 1980-------- ---% stand reduction--- Soybean	Sugarbeet	-------August 1981------- ---% stand reduction--- Soybean	Sugarbeet
1	40 - 63	75 - 89	50 - 60	98 - 100
2	82 - 87	92 - 96	75 - 80	98 - 100
4	95 -100	97 -100	92 - 95	98 - 100

Summary

Chlorsulfuron residual in the soil the second year after application caused similar soybean and tended to cause greater sugarbeet stand losses than one year after application. Soil moisture after the crops were seeded was high in 1981 and the summers of 1979 and 80 were quite dry. The moldboard plowing may have returned the chlorsulfuron back to the surface in 1981. Soil movement by tillage and wind may have caused some cross contamination among plots. Individual rate blocks were 65 by 25 ft.

Forage Production in Pasture and Rangeland Following Two 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 McLoud, and two sites on a state 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. 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 + 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. In July 1981, a 3 by 25 ft section of each plot was havested with a flail 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. All data are shown in the table and each mean is an average of eight plots, i.e. four sites with two replications per site.

Picloram 2S at 2 lb/A provided the best leafy spurge control after two years averaging 84% without a retreatment and up to 91% with a retreatment of picloram 2S at 0.25 lb/A. Picloram 2%G at 2 lb/A was the only other original treatment that provided fair control by August 1981 without a retreatment. The best retreatments for leafy spurge control were picloram at 0.25 lb/A alone or in combination with 2,4-D at 1.0 lb/A which provided 60 and 63% control, respectively. Retreatment with dicamba at 2.0 lb/A averaged 46% control, but dicamba at 1.0 lb/A and 2,4-D at 1.0 lb/A did not improve control compared to no retreatment.

Forage yield increased for 50 of the 59 treatments compared to the control, and the yield increased over 250% for five treatments. The five highest yielding treatments (Year 1 + Year 2) were: control + (picloram + 2,4-D at 0.25 + 1.0 lb/A), 2,4-D at 2 lb/A + picloram at 0.25 lb/A, control + picloram at 0.25 lb/A, picloram 2S at 1 lb/A + (picloram + 2,4-D at 0.25 + 1.0 lb/A), and picloram 2%G at 2 lb/A + dicamba at 1.0 lb/A. The treatment with the best overall leafy spurge control at 91% was picloram 2S at 2.0 lb/A but the forage yield was intermediate at 1354 lb/A. The highest yielding treatment at 1870 lb/A was picloram + 2,4-D at 0.25 1.0 lb/A in Year 2 without a Year 1 treatment and had 52% leafy spurge control. The latter treatment is more economical, and yearly applications can be expected to reach leafy spurge control of 80 to 90% after three to four years. If the terrain makes yearly treatments unfeasible, the picloram at 2.0 lb/A treatment can be expected to give good leafy spurge control for two to three years.

Table. Leafy spurge control with resulting forage production after two years (Lym and Messersmith).

Year one treatment	Rate (lb/A)	Soln[a] conc	Year two treatment/rate (lb/A) 2,4-D 1	Dicamba 1	Dicamba 2	Picloram 0.25	2,4-D+Picloram 1+0.25	Control 0	Mean
			(Percent control)						
2,4-D	2		13	25	19	48	56	9	28
Picloram	2%G	1	11	23	38	38	56	15	31
Picloram	2%G	2	71	78	75	90	89	79	80
Picloram	2S	1	51	45	61	68	69	53	59
Picloram	2S	2	90	85	89	91	86	84	88
Roller		1:7	28	40	40	51	55	40	42
Roller+oil conc		1:7	44	46	51	62	63	33	50
Wick		1:3	31	13	24	46	50	31	33
Wick+oil conc		1:3	30	35	42	62	57	27	42
Control			5	12	18	41	52	0	21
Mean			38	41	46	60	63	37	

LSD(0.05)=yr 1=7; yr 2=6; yr 1 x yr 2=18

Year one treatment	Rate (lb/A)	Soln[a] conc	2,4-D 1	Dicamba 1	Dicamba 2	Picloram 0.25	2,4-D+Picloram 1+0.25	Control 0	Mean
			(Yield/lb/A)						
2,4-D		2	1409	1142	1293	1712	1233	1360	
Picloram	2%G	1	1343	1112	1195	1164	1124	1177	
Picloram	2%G	2	1464	1554	1247	1313	1264	1284	
Picloram	2S	1	936	1223	1293	1101	1569	1315	
Picloram	2S	2	1159	1080	1013	1354	1159	1114	
Roller		1:7	1423	1230	1301	1387	1150	1233	
Roller+oil conc		1:7	1360	1344	1093	1338	1018	1250	
Wick		1:3	1278	1373	1146	1141	1223	915	
Wick+oil conc		1:3	1181	1157	1039	886	907	881	
Control			1082	1178	881	1681	1870	623	

LSD (0.05)= 421

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

Long term management of leafy spurge in pasture and rangeland - year one. 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 Sept. 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 + 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. Also, stand counts of leafy spurge were taken in each plot in the spring of 1981. The number of stems in six 1 yd^2 samples was counted in each plot. Data from the Dickinson site are limited, due to extreme drought in 1980 and early 1981. All data are shown in the table.

ANOVA showed significant treatment by site interaction, so treatments will be discussed by sites. The 2,4-D at 2 lb/A treatment did not provide long term leafy spurge control. Control in spring 1981 ranged from 47% at the spring Valley City site to 3% at Minot. The stand counts at four sites for the 2,4-D treated plots and the control were similar, and there was a significant increase at Minot in the number of stems/yd^2 compared to the control when treated with 2,4-D at 2 lb/A.

Picloram 2%G at 1 and 2 lb/A at four sites provided excellent leafy spurge control when evaluated after 12 months, except 1 lb/A at Sheldon. Leafy spurge control with picloram 2%G at 1 lb/A was good after 12 months but poor after 15 months at all sites. Stand counts revealed that picloram 2%G at 1 and 2 lb/A significantly reduced the number of stems/yd^2 at all sites except with picloram 2%G at 1 lb/A at Sheldon.

Picloram 2S at 2 lb/A provided the best leafy spurge control regardless of site. Spring evaluation showed that the treatment provided 99 or 100% control at all sites and stem counts ranged from 0 at Sheyenne to 18 at Minot after 1 year. Picloram 2S at 1 lb/A was less successful, especially at Tolna and Minot where control was rated at 65 and 80%, respectively. Fall evaluation revealed that the longevity of control ranged from 100% at Tolna to 63% at Sheldon.

The roller application of picloram at 1:7 (v:v) provided 90 and 97% leafy spurge control at Sheyenne and Valley City (fall applied), respectively, when evaluated in spring 1981. The picloram plus oil concentrate treatment provided slightly better control than picloram alone when fall applied at Valley City but leafy spurge control decreased when the oil concentrate was added at the other sites. The picloram plus oil concentrate treatment provided 91% control at Valley City when evaluated in the fall one year after roller application, but other roller applied treatments did not provide satisfactory control. The leafy spurge stand was reduced with the roller treatments at all sites except Tolna and Minot. The leafy spurge was very short at application at Minot and Tolna which greatly reduced the number of stems contacted by the roller and probably accounts for the reduced control.

Leafy spurge control with picloram at 1:3 (v:v) applied with the wick applicator ranged from 79% when spring applied at Valley City to 54% at Minot. As with the roller treatments, the oil concentrate decreased control at all sites except when fall applied at Valley City. The wick treatment did not provide satisfactory control when evaluated in the fall of 1981. Most wick treatments reduced the leafy spurge stand counts compared to the control.

Dicamba at 4 and 8 lb/A was applied at three sites. Dicamba at 4 lb/A did not provide good leafy spurge control. Dicamba at 8 lb/A reduced stand counts and control ranged from 75% at Tolna to 13% at Dickinson in fall 1981.

In summary, 2,4-D at 2 lb/A did not control leafy spurge after one year and the number of stems increased at several sites. Picloram 2%G and 2S at 2 lb/A gave excellent leafy spurge control after 1 year, but control decreased rapidly at several sites after 15 months. The roller and wick application of picloram provided significantly poorer control than broadcast application. The poor results from these applicator treatments may be due to the generally poor growing conditions in 1980. The leafy spurge was rather short and not growing vigorously so the short stems may not have been treated and herbicide translocation may have been poor in treated stems. Dicamba at 8 lb/A did reduce the stand count but gave only fair leafy spurge control. (Dep. of Agron., published with the approval of the Ag. Exp. Stn., North Dakota State University, Fargo.)

Table. Long term management of leafy spurge. (Messersmith and Lym).

Evaluation date / Treatment	Herbicide Rate (lb/A)	Sol'n[a] conc	Location: Sheyenne	Sheldon	Valley City (Spring)	Valley City (Fall)	Tolna	Minot	Dickinson	Avg.
Spring 1981			(percent control)							
2,4-D (LVE)	2	1:15	19	18	47	14	8	3	--	18
Picloram 2%G	1	----	96	24	87	93	--	--	--	76
Picloram 2%G	2	----	98	98	99	96	--	--	--	98
Picloram 2S	1	1:15	94	95	99	100	65	80	--	88
Picloram 2S	2	1:7	100	100	99	99	99	99	--	99
Roller	-	1:7	90	78	71	97	6	53	--	65
Roller+oil conc.	-	1:7	65	53	61	100	8	36	--	54
Wick	-	1:3	59	69	79	71	64	54	--	66
Wick+oil conc.	-	1:3	44	71	75	94	73	45	--	67
Dicamba 4S	4	1:7	--	--	--	--	26	31	--	29
Dicamba 4S	8	1:3	--	--	--	--	60	80	--	29
LSD (0.05)			33	32	39	9	42	22		
Fall 1981			(percent control)							
2,4-D (LVE)	2	1:15	23	0	1	11	0	5	0	6
Picloram 2%G	1	----	41	3	8	0	--	--	--	13
Picloram 2%G	2	----	89	76	86	69	--	--	--	80
Picloram 2S	1	1:15	43	21	51	97	55	0	87	50
Picloram 2S	2	1:7	99	63	77	97	100	80	96	87
Roller	-	1:7	78	5	5	74	10	10	0	26
Roller+oil conc.	-	1:7	30	11	1	91	5	20	28	27
Wick	-	1:3	35	21	39	28	40	15	0	25
Wick+oil conc	-	1:3	0	4	50	55	0	25	30	23
Dicamba 4S	4	1:7	--	--	--	--	75	20	51	48
Dicamba 4S	8	1:3	--	--	--	--	75	13	35	41
LSD (0.05)			75	36	47	7	65	51	38	
Spring 1981			(stems/yd^2)							
2,4-D (LVE)	2	1:15	378	721	555	373	1376	2925	--	--
Picloram 2%G	1	----	29	451	132	178	----	----	--	--
Picloram 2%G	2	----	5	2	2	122	----	----	--	--
Picloram 2S	1	1:15	44	14	2	0	284	519	--	--
Picloram 2S	2	1:7	0	1	2	1	5	18	--	--
Roller	-	1:7	26	151	308	33	1460	1148	--	--
Roller+oil conc.	-	1:7	71	197	264	3	1241	947	--	--
Wick	-	1:3	279	207	325	98	292	548	--	--
Wick+oil conc.	-	1:3	291	159	200	82	591	774	--	--
Dicamba 4S	4	1:7	---	---	---	---	811	2165	--	--
Dicamba 4S	8	1:3	---	---	---	---	274	297	--	--
Control	------		557	538	872	496	1308	1469	--	--
LSD (0.05)			138	246	502	---	781	791		

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

Roller and wick application of picloram for leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. Experiments were established to evaluate roller and wick application of picloram as an economical alternative for leafy spurge control in pastureland. Leafy spurge control and the picloram soil residue after treatment were compared for conventional broadcast, roller and wick applications. Also, variable picloram concentrations and an additive with picloram 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.

All experiments were a randomized complete block design with four replications, except the second experiment had five replications. The broadcast treatments were applied at 35 psi, and at 8.5 gpa for the first two experiments and 8 gpa for the last two experiments. The picloram concentrations with the roller and wick applicators 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 September 22, 1978 near Valley City, ND with broadcast treatments of picloram compared to roller applications with and without a foam additive. The second experiment was established on October 3, 1979 near Walcott, ND with a similar objective as the first experiment except an additive with picloram was not used. The leafy spurge was 20 to 25 inches tall with senescent lower leaves but new fall growth on the stem tips for both experiments.

Picloram applied broadcast at 2 lb/A or with the roller applicator using the foam additive at either 1 or 3 mph gave similar results throughout the three years of observations (Table 1). Control was in the upper 90% range for these treatments in the May 1979 evaluations and then began a steady decline as the remaining plants reestablished in the plot area. In June 1981, 33 months after the treatments were applied, control ranged from 61 to 72%. The treatment applied at 3 mph without a foam additive consistently had the lowest control throughout the evaluation period. These data suggest that leafy spurge control by picloram may be due primarily to absorption and translocation within the plant soon after application and not the long soil residual of picloram.

For the second experiment, picloram broadcast at 2 lb/A provided 100% control in the year following treatment, and control had decreased slightly to 96% by the end of the second year (Table 2). 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 years after application. Leafy spurge control for the roller applied treatments was lower than comparable observations for the previous experiment. These treatments were applied when the leafy spurge had lost most of its leaves, the temperature was in the low 40's F and a killing frost occurred within 6 days. These treatment conditions suggest that picloram absorption and translocation was reduced by low weed vigor and cold conditions resulting in reduced control.

Table 1. Leafy spurge control with picloram using the roller applicator near Valley City, ND for treatments applied September 22, 1978. (Lym and Messersmith).

Type of application	Additive	Rate[a] (lb/A)	Control May 31, 1979	Aug. 29, 1979	May 30, 1980	Aug. 27, 1980	June 23, 1981
			(%)				
Broadcast	None	1	88	82	74	65	36
Broadcast	None	2	98	91	88	72	61
Roller - 1 mph	None	2	91	87	82	66	53
Roller - 3 mph	None	2	94	69	52	36	20
Roller - 1 mph	Foam	2	97	94	94	77	72
Roller - 3 mph	Foam	2	97	88	83	73	62
Control	----	-	0	0	0	0	0
LSD (0.05)			9	10	17	23	30

[a] Solution concentration on the roller was the same as 2 lb/A at 8.5 gpa broadcast.

Table 2. Leafy spurge control with picloram using the roller applicator near Walcott, ND for treatments applied October 3, 1979. (Lym and Messersmith).

Type of Application	Rate[a] (lb/A)	Control May 8, 1980	June 24, 1980	May 22, 1981	Aug. 19, 1981
		(%)			
Broadcast	1	99	79	59	19
Broadcast	2	100	100	98	96
Roller - 1 mph	2	99	80	61	43
Roller - 2 mph	2	94	77	70	53
LSD (0.05)		6	13	19	32

[a] Solution concentration on the roller was the same as 2 lb/A at 8.5 gpa broadcast.

The third 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 June 16, 1980 near Sheldon, ND and in the fall near Valley City, ND on September 2, 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. A 1:3 solution concentration seemed to be the most efficient for both applicators (Table 3). In general the fall treatment had better leafy spurge control than spring applications, but the experiments were not at the same site and there has been nearly two full growing seasons after the spring treatments.

Table 3. Leafy spurge control with variable picloram concentrations using the roller and wick applicators with treatments applied on June 16, 1980 at Sheldon and September 2, 1980 at Valley City. (Lym and Messersmith).

		---Location/Evaluation date---			
		Sheldon		Valley City	
Applicator	Picloram concentration[a]	May 26, 1981	Aug. 20, 1981	June 17, 1981	Sept. 2, 1981
		---% control---			
Roller	1:1	90	58	96	93
Roller	1:3	93	48	97	81
Roller	1:7	75	15	91	50
Roller	1:11	70	9	67	15
Roller	1:15	69	12	35	3
Wick	1:1	88	38	96	92
Wick	1:3	80	18	93	78
Wick	1:7	41	2	79	28
Wick	1:11	49	8	68	5
Wick	1:15	62	5	15	0
LSD (0.05)		14	21	17	22

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

A fourth experiment to evaluate the usefulness of additives with picloram when using the roller and wick applicators was established on June 12 and 16, 1980 near Sheldon. A surfactant and a petroleum based oil at 5% (v:v) were added to various picloram concentrations. Neither additive at any picloram concentration improved leafy spurge control over the same rate without an additive, and there was a trend for the additives to decrease control (Table 4).

Table 4. Leafy spurge control with picloram plus additives using roller and wick applicators with treatments applied on June 12 and 16, 1980. (Lym and Messersmith).

Method	Picloram concentration[a]	Additive: None	Surfel[b]	Oil[c]	Mean
		-----% control-----			
Roller	1:7	74	67	56	66
	1:11	48	45	37	43
	1:15	46	53	51	43
Mean		56	55	48	
LSD (0.05)=conc=16;add=16;concxadd=27					
Wick	1:3	76	77	81	78
	1:7	38	44	68	50
	1:11	45	50	57	51
Mean		53	57	67	
LSD (0.05)=conc=17;add=17;concxadd=29					

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

[b] 5% surfactant (v:v).

[c] 5% oil(v:v) (83% paraffin base petroleum oil + 15% emulsifier).

Leafy spurge control for the third and fourth experiments that were established in 1980 generally was less than for the first and second experiments established in 1978 and 1979. Leafy spurge control in other experiments at the same locations as the 1980 experiments generally had lower weed control than other sites with comparable treatments, which suggests that location differences may have affected control. Also, 1980 was a dry year so many of the leafy spurge stems were shorter than normal. Perhaps the procedure of adjusting the roller and wick applicator height to treat the upper half of the tallest leafy spurge stems resulted in insufficient contact with the short weed stems to provide control comparable to the results of previous years.

A soil bioassay was conducted to determine the picloram residue from broadcast, roller, and wick applications. Plots from two adjacent experiments were sampled to obtain the full range of treatments shown in Table 5. Six soil samples to an 8 inch depth were taken from each plot in October which was 19 weeks after treatment. Sunflower height, and fresh and dry weight in a greenhouse bioassay were used to determine the picloram residual. The experimental design was completely random with three replications.

Table 5. Estimates of the picloram residue in soil 19 weeks after application for treatments applied near Sheldon, ND in 1980 by a sunflower bioassay. (Lym and Messersmith)

Application method	Rate (lb/A)/ solution conc.(v:v)	Picloram residue (ppm)
Broadcast	1	0.03
Broadcast	2	0.17
Roller	1:1	0.07
Roller	1:3	0.06
Roller	1:7	0.03
Roller	1:7 + 5% crop oil	0
Roller	1:11	0
Roller	1:15	0.05
Wick	1:1	0.19
Wick	1:3	0.04
Wick	1:3 + 5% crop oil	0.06
Wick	1:7	0
Wick	1:11	0
Wick	1:15	0.01
Control	----	0
LSD (0.05)=0.04		

Picloram at 2 lb/A broadcast had a residual of 0.17 ppm and the wick application at 1:1 (v:v) was very similar with 0.19 ppm picloram residual (Table 5). Picloram at 1 lb/A broadcast had a residual of 0.03 ppm, and the residual was similar for 4 of 6 roller-applied treatments and 2 of 6 wick-applied treatments. Picloram from the roller and wick applied treatments could be reaching the soil through several methods including washing from treated plants, release through decomposition of treated stems and roots, and exudation from the roots of treated plants directly into the soil. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State Univ., Fargo.)

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[a]	lb/A	May 22, 1981	Aug. 19, 1981
			(%)	
Broadcast	1:11	(2.0)	98	88
Broadcast	1:23	(1.0)	98	83
Broadcast	1:31	(0.75)	95	78
CDA	1:11	(0.2)	78	55
CDA	1:23	(0.1)	31	28
CDA	1:31	(0.075)	56	25
Wick	1:11	(0.5)	85	79
Wick	1:23	(0.25)	80	40
Wick	1:31	(0.125)	69	8
LSD (0.05)			33	38

[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 on May 22, 1981. The perennial plants in these plots had been killed and a thick mat of leafy spurge seedlings had germinated. Most of the seedlings died by August 19, but enough seedlings survived so that the overall control declined 10 to 17%.

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. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State University, Fargo.)

Picloram formulations and application equipment for leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. Several experiments were established to evaluate four picloram formulations for leafy spurge control. Formulations evaluated included picloram 2S (Tordon 22K), M-4505, M-4506 and picloram plus 2,4-D at 1 plus 2 lb/gal (Tordon 212). Formulations were evaluated using broadcast, roller, controlled droplet applicator (CDA), and two types of pipe-wick applicators (one covered with polyfoam and canvas, and the other with Nylafoam, a polyfoam with bristles attached to one side used for painting). The broadcast treatments were applied with a tractor mounted sprayer that delivered 8.5 gpa at 35 psi, the CDA delivered approximately 0.85 gpa with the pipe-wick applicator approximately 2.25 gpa and the roller applicator approximately 4.5 gpa. All plots were 10 by 30 ft and replicated four times in a randomized complete block. The broadcast experiment was established on 24 June 1980 near Walcott, ND with a tractor sprayer while all other experiments were established on 21 and 22 July 1980 near Sheldon, ND. All experiments were evaluated on 22 May 1981 and the broadcast experiment was reevaluated on 19 August 1981. All evaluations were based on stand reduction as compared to the control.

Picloram formulation	Solution[a] Ratio/lb/A		Application/method: Roller	Canvas wick	Nylafoam wick	CDA	Broadcast: May	Aug.	Mean[b]
			(% control)						
Picloram 2S	1:7	(1.0)	0	37	70	22	91	85	44
M-4505	1:7	(1.0)	5	52	68	29	98	69	50
M-4505	1:11	(0.5)	5	28	48	19	93	43	39
M-4506	1:7	(1.0)	0	51	52	25	96	66	45
M-4506	1:11	(0.5)	0	44	52	43	95	18	47
Picloram+2,4-D[c]	1:7	(1.0+2.0)	5	38	53	18	93	44	41
Picloram+2,4-D[c]	1:11	(0.5+1.0)	5	24	53	9	85	7	35
LSD (0.05)				17	24	27	10		
Mean			3	39	57	55	93	33	

LSD (0.05) Application method=10; Picloram formulation=12

[a] Solution was herbicide:water (v:v) in all except broadcast spray which was calculated in lb/A.

[b] Mean does not include the conventional broadcast treatment data of 19 August 1981.

[c] Tordon 212 (picloram at 1 lb/gal+2,4-D at 2 lb/gal).

The roller applied treatments did not control leafy spurge regardless of picloram formulation. M-4505 and M-4506 at 1:7 (v:v) tended to provide better control than picloram 2S when applied with the canvas wick, but these differences were not observed with the Nylafoam wick or CDA. All broadcast treatments except the picloram plus 2,4-D at 0.5 plus 1.0 lb/A provided over 90% control when evaluated on 22 May 1980, but only picloram 2S with 85% control provided satisfactory results on 19 August 1981. The best leafy spurge control with all picloram formulations occurred with the broadcast application. Picloram applied by Nylafoam wick and CDA provided fair control but a higher herbicide rate would be needed to give satisfactory control. Leafy spurge control was not improved with picloram formulations other than the present commercial picloram 2S (Tordon 22K) formulation. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State University, Fargo.)

Leafy spurge control using the controlled droplet applicator with picloram plus additives. Lym, Rodney G. and Calvin G. Messersmith. Several experiments were established to evaluate leafy spurge control with picloram using the controlled droplet applicator (CDA). The CDA is designed to deliver herbicide in a precise spray pattern with a uniform droplet size of 200-microns. The CDA delivers much less herbicide per acre than the conventional broadcast sprayer. Thus the CDA would be a more economical method of application if control were comparable to conventional broadcast application.

The first experiment was established near Walcott, ND on 30 June 1980. The weather was dry and 72 F, 64% relative humidity, and 82 F soil temperature at one inch. The leafy spurge was 20 to 30 inches tall and the soil was moist. Picloram was applied to leafy spurge in picloram:water (v:v) solution concentrations ranging from 1:1 to 1:15. A surfactant (Surfel) and an oil (85% paraffin base petroleum oil plus 15% emulsifier) were added at a 5% concentration (v:v). The CDA was calibrated to deliver 60 ml/min for all solution concentrations. The spray width of the hand held CDA was 4 ft and the plot size was 5 by 30 ft replicated four times in a randomized complete block design. Evaluation was based on stand reduction as compared to the control.

The solution concentration of 1:1 delivered approximately 0.1 lb/A of picloram. The 1:1 treatment provided 79% control when averaged across all additives which was significantly higher than any other treatment when evaluated 11 months after application (Table 1). Leafy spurge control was not improved by including a surfactant or oil additive. By August 1981, leafy spurge control for the 1:1 treatments had decreased to 53%, and all other treatments showed similar decreases.

An experiment to evaluate leafy spurge control with picloram alone using the CDA was established at two sites. The first site was near Minot, ND and the experiment was established on 10 July 1980 with the leafy spurge 6 to 12 inches tall and under drought stress. The soil temperature at 1 inch was 82 F, 69% relative humidity, and 79 F at treatment and 102 F later in the day. The second site was near Dickinson, ND where the leafy spurge 10 to 12 inches tall and drought stressed. The experiment was established on 15 July 1980 with conditions of 65 F, 51% relative humidity, and 70 F soil temperature at 1 inch. The plots were 10 by 30 ft and replicated four times in a randomized complete block design.

Leafy spurge control varied at these sites (Table 2). Picloram at 1:1 and 1:3 concentrations gave 35 and 31% control, respectively, at Dickinson, and 90% and 0% control, respectively, at Minot. The results from Dickinson are similar to the August evaluations at Walcott. The large difference in the control between Minot and the other two sites may be due to an environmental effect. Both the Dickinson and Minot sites were under drought stress but the air was very hot and dry after treatment at Minot which may have reduced picloram absorption.

Leafy spurge control by picloram using the CDA applicator was fair at the highest solution concentration tested. The light weight and ease of operation of the CDA is an advantage of the equipment over the traditional hand held sprayer for use in special situations like shelterbelts and spot treatments. Further research is necessary to evaluate the effectiveness of the CDA. (Dep. of Agron., published with the approval of the Ag. Exp. Stn., North Dakota State University, Fargo.)

Table 1. Leafy spurge control using the CDA applicator with picloram plus additives - Walcott, ND. (Lym and Messersmith).

Evaluation date	Picloram concentration[a]/(lb/A)		Additive/control None	Surfactant[b]	Oil[c]	Mean
			---------------(%)---------------			
22 May 1981	1:1	0.1	70	84	84	79
	1:3	0.025	70	66	43	60
	1:7	0.0125	51	64	56	57
	1:11	0.008	20	46	29	32
	1:15	0.00625	43	28	43	38
	LSD (0.05)=Conc=19; Add=14; Conc x Add=33					
19 Aug. 1981	1:1	0.1	34	70	56	53
	1:3	0.025	29	19	11	19
	1:7	0.0125	3	4	13	7
	1:11	0.008	0	0	1	0
	1:15	0.00625	0	0	0	0
	LSD (0.05)=Conc=13; Add=10; Conc x Add=22					

[a] Picloram (Tordon 22K):water (v:v).
[b] 5% surfactant (Surfel) (v:v).
[c] 5% oil (v:v) (83% paraffin base petroleum oil + 15% emulsifier).

Table 2. Leafy spurge control with picloram using the controlled droplet applicator, Dickinson and Minot, ND. (Lym and Messersmith).

Solution concentration[a](lb/A)		Control: Dickinson 25 Aug. 1981	Minot 11 June 1981	Minot 15 Sept. 1981
		---------(%)---------		
1:1	(0.1)	35	97	90
1:3	(0.025)	31	0	0
1:7	(0.0125)	16	0	0
1:11	(0.008)	0	0	0
1:15	(0.006)	6	0	0
LSD (0.05)		16	--	--

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

Leafy spurge control with picloram and glyphosate under trees. Lym, Rodney G. and Calvin G. Messersmith. Leafy spurge control is a major problem in wooded areas, shelterbelts, and parks. Glyphosate can be safely used under trees with leafy spurge control generally ranging from 80 to 90% when the herbicide is fall applied. Two disadvantages of glyphosate are its nonselective nature and a retreatment with 2,4-D is required the following year to control seedlings. Picloram effectively controls leafy spurge, but it is toxic to deciduous trees, especially shallow rooted trees which are often found in draws and run-off areas. 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 purpose of these experiments was to evaluate the CDA for safely applying picloram and glyphosate on leafy spurge growing under trees. Also picloram was applied using a two-foot wide hand-held pipe wick covered by polyfoam and canvas. Picloram (Tordon 22K):water and glyphosate (Roundup):water concentrations varied for 1:1 to 1:15 (v:v) with both applicators. The experiments were established in a tree grove, with many saplings and 2 to 3 inch diameter young trees, which had been infested with leafy spurge. Each plot was approximately 10 by 30 ft in a randomized complete block design. The treatments were applied on 28 July 1980 under a partly cloudy sky, 78 F, and 50% relative humidity. The data are reported in the table.

Leafy spurge control with picloram at 1:1, 1:3, and 1:7 (v:v) applied by the CDA was very good when evaluated on 22 May 1981, but dropped dramatically by 19 August 1981. Picloram at 1:1 and 1:3 (v:v) severely damaged the young saplings in several plots and killed several trees at 1:1 (v:v).

Glyphosate at 1:1 (v:v) provided 87% control of leafy spurge the following spring, which is similar to the control normally obtained with glyphosate at 1 lb/A broadcast. However, leafy spurge seedlings quickly reestablished in all plots because a follow-up treatment was not applied. The other glyphosate treatments did not provide satisfactory control.

Leafy spurge control was very good with picloram at 1:1, 1:3, and 1:7 (v:v) applied by the hand held wick when evaluated on 22 May 1981, but control decreased rapidly by 19 August 1981. It was expected that thest treatments would not harm the trees. However, picloram at 1:1, 1:3 and 1:7 (v:v) caused severe leaf damage to all the saplings and larger trees, and most of the saplings were killed by picloram at 1:1 (v:v) by the end of the summer. Since picloram was not applied to the soil, perhaps the herbicide was exudated by the leafy spurge roots or released as the weed roots decayed. Tree damage generally was greater following wick than CDA application.

The CDA may be useful in trees, because fair leafy spurge control was obtained and the equipment is lightweight and easy to operate. Further research is needed with the CDA to better assess the risk of damage to small and large trees. The hand held wick was judged unsatisfactory due to tree damage and difficult handling in wooded areas. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State Univ., Fargo.)

Table. Leafy spurge control by picloram and glyphosate applied with the controlled droplet and wick applicators under trees - Walcott, ND (Lym and Messersmith).

Applicator	Herbicide	Herbicide concentration[a]	Control 22 May 1981	Control 19 Aug. 1981
CDA	Picloram	1:1	93*	66**
	Picloram	1:3	92*	23*
	Picloram	1:7	96	23
	Picloram	1:11	76	2
	Picloram	1:15	56	0
LSD (0.05)			24	35
CDA	Glyphosate	1:1	86	0
	Glyphosate	1:3	23	0
	Glyphosate	1:7	54	0
	Glyphosate	1:11	36	0
	Glyphosate	1:15	16	0
LSD (0.05)			37	
Wick	Picloram	1:1	85*	61**
	Picloram	1:3	89*	34*
	Picloram	1:7	85*	5
	Picloram	1:11	48	0
	Picloram	1:15	68	0
LSD (0.05)			33	36

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

* Damaged trees, ** Trees killed in at least one of the four plots.

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 five experiments established on June 25 near Valley City, July 2 near Tolna, July 10 near Minot, and July 15, 1980 near Dickinson, ND and on September 3, 1980 near Valley City. An experiment to compare liquid and granular picloram in a sandy soil was established on June 11, 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 plot sprayer at 8 gpa. Evaluations were based on percent stand reduction compared to the control. The ANOVA test revealed that there was highly significant interaction between site and treatments. Therefore, experimental sites will be discussed individually.

At Valley City leafy spurge control from equal picloram rates gave similar leafy spurge control regardless of application date (Table 1). Picloram 2%G at 1 lb/A was less effective than higher rates for both application dates. Dicamba 4S and 5%G, spring and fall treatments provided similar control when evaluated one year after application. Dicamba 4S and 5%G at 8 lb/A gave between 91 and 100% control when evaluated one year after treatment. Leafy spurge control from spring applied dicamba declined rapidly during the summer of 1981. Fall applied dicamba 4S at 8 lb/A and dicamba 5%G at 6 and 8 lb/A gave very similar control to picloram at 2 lb/A one year later, but dicamba was less effective than picloram when spring applied.

Leafy spurge control at Valley City generally was better than at the other sites. At Tolna, picloram 2S at 2 lb/A and 2%G at 1.5 and 2 lb/A provided 95, 98 and 100% leafy spurge control, respectively, when evaluated 14 months after treatment (Table 1). Dicamba 4S at 8 lb/A gave 89% control, but the 5%G treatments did not provide comparable control. At Minot, picloram 2S and 2%G at 2 lb/A provided 85 and 81% control, respectively, when evaluated 14 months later, but the other treatments did not provide satisfactory control. At Dickinson, only picloram 2S at 2 lb/A provided satisfactory control at 91%.

Picloram 2S and 2%G at equal rates provided similar leafy spurge control when evaluated on the sandy soil of the Sheyenne National Grasslands (Table 2). Picloram 2S and 2%G at 2 lb/A provided 99 and 98% control, respectively, but the other treatment did not give satisfactory control when evaluated 14 months after treatment.

Dicamba and picloram granular and liquid formulations generally provided similar leafy spurge control when compared at equal application rates. The comparably poor leafy spurge control at Minot and Dickinson may be due to unfavorable environmental conditions. The entire state of North Dakota received below normal precipitation and above normal temperatures in both 1979 and 1980

Table 1. Leafy spurge control using granular picloram and dicamba applied in 1980 at various locations in North Dakota. (Lym and Messersmith)

		Location/Evaluation date								
		Valley City				Tolna		Minot		Dickinson
		Spring		Fall						
Herbicide	Rate (lb/A)	6-17-81	9-2-81	6-17-81	9-2-81	6-8-81	9-9-81	6-11-81	9-15-81	8-25-81
		(%)								
Picloram 2%G	1	97	80	95	86	79	60	72	28	56
Picloram 2%G	1.5	98	89	99	100	88	98	85	30	74
Picloram 2%G	2	99	98	100	100	98	100	96	81	74
Dicamba 5%G	4	74	55	94	74	31	5	19	0	4
Dicamba 5%G	6	82	54	96	99	44	10	56	20	30
Dicamba 5%G	8	91	75	99	100	70	57	66	27	39
Picloram 2S	2	100	99	100	100	100	95	98	85	91
Dicamba 4S	8	94	74	99	99	88	89	61	5	42
LSD (0.05)		9	14	3	10	18	15	20	30	26

(Table 3). Dickinson and Minot, where the lowest average control occurred had the highest above normal temperature during the growing season and the first and third greatest precipitation deficit for 1979 through July 30, 1980 of -9.59 and -5.33 inches respectively (Table 3). Valley City had a deficit of 9.06 inches of annual precipitation, but rain showers just before and after the treatment dates may have accounted for the improved control at this site. All sites received above normal precipitation beginning in August 1980, and the trend continued into June 1981 which provided favorable growing conditions for leafy spurge. The poor growing conditions during application followed by favorable conditions in 1981 probably account for the general trend of inadequate leafy spurge control. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State University, Fargo.)

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

Herbicide formulation	Rate (lb/A)	May 27, 1981	Aug. 19, 1981
		(%)	
Picloram 2S	0.5	73	13
Picloram 2S	1.0	98	73
Picloram 2S	2.0	100	99
Picloram 2%G	0.5	53	5
Picloram 2%G	1.0	97	72
Picloram 2%G	2.0	100	98
LSD (0.05)	---	25	12

Table 3. Average annual 1979 and 1980 precipitation and temperature departure from normal for various locations in North Dakota. (Lym and Messersmith).

	Departure from normal			
	Precipitation			Temperature
Location[a]	1979	Jan-July 1980	Aug-Dec 1980	1980 (April-July)
	inch			F
Dickinson	-3.63	-5.96	+2.64	+6
Minot	-1.21	-4.12	+7.50	+6
Sheldon	-1.11	-1.04	+0.21	+4
Tolna	-2.85	-1.43	4.12	+5
Valley City	-4.05	-5.01	+2.54	+3

[a] The climatological data is recorded from the nearest reporting station to the experimental site.

Plant growth regulators and herbicides for leafy spurge control. Lym, Rodney G. and Calvin G. Messersmith. An experiment was established near Walcott, ND to evaluate picloram plus chlorflurenol and bentazon plus mefluidide for leafy spurge control. The treatments were applied on 24 June 1981 and the leafy spurge was 12 to 15 inches tall and beginning seed set. The sky was overcast, 77 F, 70% relative humidity and the soil was 69 F at 1 and 2 inches. The herbicide and plant growth regulators (PGR) were applied as a tank mix using a tractor mounted sprayer that delivered 8.5 gpa at 35 psi. The plots were 10 by 35 ft, and treatments were replicated four times in a randomized complete block. Evaluations were based on percent stand reduction as compared to the control and results are shown in the table.

Herbicide	Plant growth regulator	Rate (lb/A)	Control 22 May 1981	Control 19 Aug. 1981
			(%)	(%)
Picloram	----	0.375	77	14
Picloram	----	0.75	94	73
Picloram	chlorflurenol	0.375 + 1.0	83	18
Picloram	chlorflurenol	0.75 + 1.0	93	47
Bentazon	----	0.75	2	0
Bentazon	----	1.5	5	0
Bentazon	mefluidide	0.75 + 0.375	14	0
Bentazon	mefluidide	1.5 + 0.75	15	0
LSD (0.05)			15	21

Picloram plus chlorflurenol controlled leafy spurge similar to picloram alone. Picloram at 0.375 lb/A alone and with chlorflurenol at 1.0 lb/A provided 77 and 83% control, respectively, when evaluated in May, but the control had decreased to 14 and 18%, respectively, by August. Picloram at 0.75 lb/A alone and in combination with chlorflurenol at 1.0 lb/A provided similar control of 94 and 93%, respectively, when evaluated in May 1981. However, by August 1981 the control ratings for picloram plus chlorflurenol had decreased to 47% which was significantly less than the 73% control with picloram alone. Neither bentazon alone nor in combination with mefluidide provided significant leafy spurge control. The herbicide plus PGR combinations did not improve the leafy spurge control over herbicides applied alone. The PGR's may have made the plants more responsive to herbicide treatment if they had been applied several days before the herbicide rather than as a tank mix. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State University, Fargo.)

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 Sept. 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. The plots were evaluated on 2 Sept. 1981 and data are shown in the table.

Time of application	Tebuthiuron pellet formulation	Rate (lb/A)	Control
	----(%)----		--(%)--
Fall	10	0.5	0
Fall	10	1.0	35
Fall	10	1.5	10
Fall	20	0.5	30
Fall	20	1.0	95
Fall	20	1.5	58
Spring	10	0.5	0
Spring	10	1.0	0
Spring	10	1.5	0
Spring	20	0.5	35
Spring	20	1.0	10
Spring	20	1.5	73
LSD (0.05)			56

Leafy spurge control with tebuthiuron varied widely within most treatments. The only treatment that provided good leafy spurge control consistently was tebuthiuron 20%G at 1 lb/A fall applied which gave 95% control. Other treatments did provide over 90% control in one replication, but nearly zero in the other. Tebuthiuron at 1 and 1.5 lb/A severely damaged the grasses regardless of formulation.

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. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State University, Fargo.)

A pipe-wick herbicide applicator for perennial weed control in pastures. Messersmith, Calvin G. and Rodney G. Lym. A pipe-wick applicator was designed to provide a greater herbicide flow rate than rope-wick applicators for perennial weed control experiments in pastures. The pipe-wick was mounted on a frame so a tractor 3-point hitch could be used for height control (Figure 1). Two wick bars were spaced 1 ft apart for double coverage of the weeds. The pipe-wick consists of 0.75 inch PVC pipe with 0.12 inch holes drilled every 2 inches and covered with a wicking material (Figure 2). 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 flows into the wick with flow rate dependent on weed density. A preliminary screening of 20 wick materials to cover the PVC pipe was conducted in the lab and greenhouse. Materials were evaluated according to ability to transfer (wick) herbicide onto plants, resistance to dripping, durability, and ease of obtaining material.

Four materials were chosen for the field study: canvas (50% cotton-50% polyester) over 1-inch wide by 0.5 inch thick polyfoam; Nylafoam, a polyfoam material covered with 0.25 inch bristles used to paint shake shingles (Padco Inc., Minneapolis, MN); dacron (G7 plain weave fabric #718 from Testfabrics, Inc., Middlesex, NJ) over 1-inch wide by 0.5 inch thick polyfoam; and a fabric belt, 1.5 inches wide. The field experiment was established on June 20, 1980 near Sheldon, ND when leafy spurge was fully flowered and 20 to 26 inches tall. Picloram (Tordon 22K):water solution concentrations of 1:7, 1:11, and 1:15 (v:v) were applied using 3 ft wide rectangular wicks. Plots were 5 by 30 ft and replicated four times in a randomized complete block design. Evaluations on May 29, 1980 were based on percent stand reduction as compared to the control.

Wick Material	Picloram concentration 1:7	1:11	1:15	Mean
	(% control)			
Canvas	13	12	5	10
Nylafoam	63	38	17	39
Dacron	6	5	4	5
Fabric belt	0	0	2	0
Mean	21	13	7	

LSD (0.05)=Materials=8;Conc.=7;MaterialxConc.=12

Nylafoam was the most effective material for wicking picloram onto leafy spurge. However, field observations revealed that Nylafoam was easily torn by woody stems and shrubs commonly found in pastures. The canvas with polyfoam backing was chosen for further evaluation, because it seemed durable and tended to provide better control than the dacron material. The fabric belt was unacceptable as a wicking material. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State University, Fargo.)

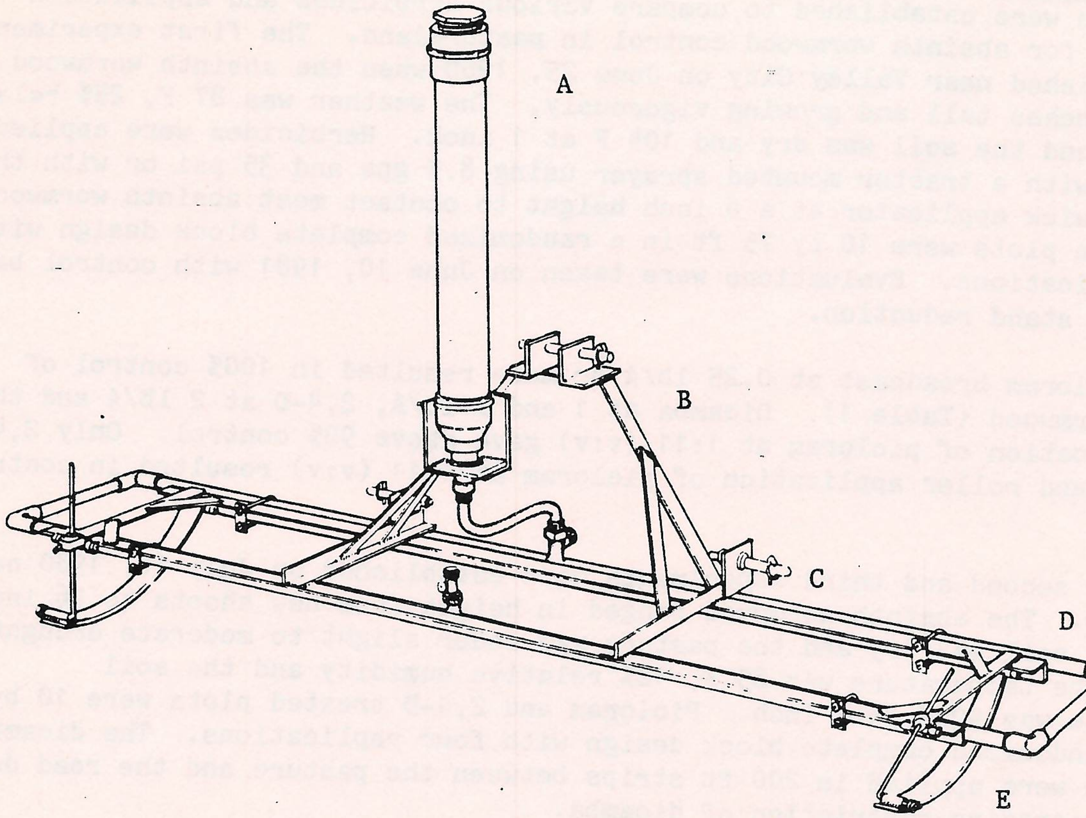

Figure 1. Pipe-wick herbicide applicator and frame with (A) storage tank, (B) 3-point hitch assembly, (C) angle iron frame, (D) 0.75-inch PVC pipe held to frame by U-clamps, and (E) skids for height control.

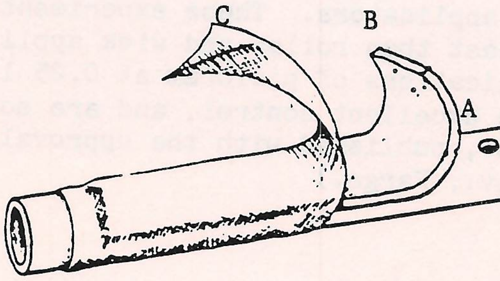

Figure 2. Bottom view of a section of the pipe-wick applicator showing: (A) 0.12 inch holes covered by (B) 0.5 inch polyfoam covered by (C) canvas.

Evaluation of various herbicides and application techniques for absinth wormwood control. Lym, Rodney G. and Calvin G. Messersmith. Three experiments were established to compare various herbicides and application techniques for absinth wormwood control in pastureland. The first experiment was established near Valley City on June 25, 1980 when the absinth wormwood was 20 to 24 inches tall and growing vigorously. The weather was 87 F, 25% relative humidity, and the soil was dry and 104 F at 1 inch. Herbicides were applied broadcast with a tractor mounted sprayer using 8.5 gpa and 35 psi or with the roller or wick applicator at a 6 inch height to contact most absinth wormwood stems. The plots were 10 by 75 ft in a randomized complete block design with three replications. Evaluations were taken on June 10, 1981 with control based on percent stand reduction.

Picloram broadcast at 0.25 lb/A or more resulted in 100% control of absinth wormwood (Table 1). Dicamba at 1 and 2 lb/A, 2,4-D at 2 lb/A and the wick application of picloram at 1:11 (v:v) gave above 90% control. Only 2,4-D at 1 lb/A and roller application of picloram at 1:11 (v:v) resulted in control below 90%.

The second and third experiments were established on July 16, 1980 near Medina, ND. The absinth wormwood ranged in height from new shoots to 36 inches tall. The soil was dry and the pasture was under slight to moderate drought stress. The temperature was 85 F, 42% relative humidity and the soil temperature was 90 F at 1 inch. Picloram and 2,4-D treated plots were 10 by 50 ft in a randomized complete block design with four replications. The dicamba treatments were applied in 200 ft strips between the pasture and the road due to the 90 day grazing restriction of dicamba.

All broadcast treatments of picloram, 2,4-D at 2 lb/A and dicamba at 1 and 2 lb/A provided excellent absinth wormwood control one year following treatment (Table 2). Only 2,4-D at 1 lb/A and dicamba at 0.5 lb/A resulted in significantly less control of 74 and 75%, respectively. Absinth wormwood control with 2,4-D and dicamba improved significantly between the 1980 and 1981 evaluations, which indicates that there was adequate herbicide translocation to prevent new crown bud formation and growth, but the elongated main stem died slowly.

Picloram applied by the roller and wick applicators did not control absinth wormwood satisfactorily one year after treatment (Table 3). In addition, severe injury to smooth bromegrass stems occurred when picloram was applied with the roller and wick applicators. These experiments indicate that picloram is more effective broadcast than roller and wick applied for absinth wormwood control. Broadcast applications of picloram at 0.25 lb/A, dicamba at 1.0 lb/A and 2,4-D at 2 lb/A gave excellent control, and are economical for pastureland use. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State Univ., Fargo.)

Table 1. Absinth wormwood control in 1981 with various herbicides applied either broadcast or with roller and wick applicators on June 25, 1980 - Valley City, ND. (Lym and Messersmith).

Herbicide	Rate (lb/A)	Control June 10, 1981
		----(%)----
2,4-D (LVE)	1.0	89
2,4-D (LVE)	2.0	96
Dicamba	1.0	97
Dicamba	2.0	99
Picloram	0.25	100
Picloram	0.5	100
Picloram + 2,4-D	0.25+0.5	100
Roller w. Picloram	1:11[a]	83
Wick w. Picloram	1:11[a]	93
LSD (0.05)		9

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

Table 2. Absinth wormwood control with broadcast applications of 2,4-D, dicamba and picloram applied on July 16, 1980 - Medina, ND. (Lym and Messersmith).

Herbicide	Rate (lb/A)	Control Aug. 26, 1980	Control June 10, 1981	Control Aug. 27, 1981
		----	(%)	----
2,4-D (LVE)	1.0	34	79	74
2,4-D (LVE)	2.0	68	97	97
Picloram	0.25	97	100	100
Picloram	0.5	100	100	100
Picloram	0.75	100	100	100
Picloram + 2,4-D	0.25+0.5	100	100	100
Picloram + 2,4-D	0.25+1.0	100	100	100
Picloram + 2,4-D	0.5+0.5	100	100	99
Control	--------	0	0	0
LSD (0.05)[a]		12	3	4
Dicamba	0.5	20	80	75
Dicamba	1.0	87	100	99
Dicamba	2.0	100	100	100

[a] Dicamba was applied separately in 200 ft strips and data was not subject to ANOVA.

Table 3. Roller and wick applications of picloram for absinth wormwood control, applied July 16, 1980 - Medina, ND. (Lym and Messersmith).

Applicator	Picloram:water [a] (v:v)	Control Aug. 26, 1980	June 10, 1981	Aug. 27, 1981
		(%)		
Wick	1:7	97	75	55
Wick	1:11	76	49	34
Wick	1:15	88	69	44
Roller	1:7	75	37	14
Roller	1:11	38	53	18
Roller	1:15	81	41	23
LSD (0.05)		22	22	24

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

Absinth wormwood control with picloram plus various additives. Messersmith, Calvin G. and Rodney G. Lym. Previous research at North Dakota State University has shown that picloram at 0.25 lb/A controls absinth wormwood, so experiments were established to evaluate the effectiveness of lower picloram rates alone and in combination with various additives and 2,4-D. Also picloram granular and liquid formulations were compared. Dowco 290 was applied and evaluated separately in 120 ft strips. The liquid herbicides were applied with a tractor sprayer delivering 8.5 gpa at 35 psi. The granules were applied by hand. All plots were 10 by 30 ft in a randomized complete block design with four replications. The experiments were established on 10 September 1980 near Medina, ND. The sky was clear and 76 F, 40% relative humidity and 74 F soil temperature at 1 inch. The absinth wormwood had been mowed early in the year and was 6 to 8 inch tall with vigorous regrowth. Evaluations were based on percent stand reduction as compared to the control.

All treatments with picloram at 0.25 and 0.5 lb/A provided 99 to 100% absinth wormwood control when evaluated one year after treatments (Tables 1, 2 and 3). Picloram at 0.5 lb/A caused slight smooth bromegrass injury in the spring but the effect was not seen in the August evaluations. Picloram at 0.125 lb/A and 2,4-D at 2 lb/A gave similar control of 82 and 83%, respectively (Table 1). The addition of 2,4-D at 0.125 and 0.25 lb/A to picloram at 0.125 lb/A did not increase the control over picloram alone. Picloram at 0.125 lb/A with an additive did not improve the control as compared to picloram at 0.125 lb/A alone (Table 2). In fact, absinth wormwood control decreased when the oil concentrate and linseed oil amine were used. The surfactant and linseed oil may have increased the effectiveness of picloram at 0.125 lb/A but these data are not significantly different when evaluated one year later. All other treatments including Dowco 290 at 0.5 and 1.0 lb/A provided 99 to 100% absinth wormwood control and an additive effect, if any, was not detected.

Picloram granular (G) and liquid formulations (S) did not provide similar absinth wormwood control when applied at the same rates (Table 3). Picloram at 0.25 lb/A provided 100% and 79% absinth wormwood control as liquid and granular formulations, respectively. Picloram 2% G at 0.5 and 0.75 lb/A resulted in nearly 100% control. Absinth wormwood is a simple perennial with a dominant taproot, so a high granular rate was required for adequate herbicide distribution near each root. (Dep. of Agron., published with the approval of Agric. Exp. Stn., North Dakota State Univ., Fargo.)

Table 1. Picloram and 2,4-D for absinth wormwood control, Medina, ND. (Messersmith and Lym).

Herbicide	Rate (lb/A)	Control 10 June 1981	Control 27 August 1981
		(%)	
Picloram S	0.125	93	83
Picloram S	0.25	100	99
Picloram S	0.5	100	100
2,4-D (LVE)	2.0	92	82
Picloram + 2,4-D	0.125+0.125	96	78
Picloram + 2,4-D	0.125+0.25	93	79
Picloram + 2,4-D	0.25+0.25	100	100
Picloram + 2,4-D	0.25+0.5	100	100
Control			
LSD (0.05)		4	17

Table 2. Picloram plus additives for absinth wormwood control, Medina, ND. (Messersmith and Lym).

Picloram (lb/A)	Additive	Rate	Control 10 June 1981	Control 27 August 1981
			(%)	
0.125	----------		94	89
0.25	----------		100	100
0.5	----------		100	100
0.125	Surfactant(Surfel)	1% (v:v)	96	98
0.125	Oil conc.(Pace)[a]	1 qt/A	73	59
0.125	Linseed oil	1 qt/A	98	98
0.125	Linseed oil amine	1 qt/A	86	62
0.25	Surfactant(Surfel)	1% (v:v)	99	100
0.25	Oil conc.(Pace)[a]	1 qt/A	99	99
0.25	Linseed oil	1 qt/A	100	100
0.25	Linseed oil amine	1 qt/A	100	99
LSD (0.05)			12	20
Dowco 290	0.5		100[b]	100
Dowco 290	1.0		100	100

[a] 83% paraffin base petroleum oil + 15% emulsifier.

[b] Dowco 290 data was not subject to ANOVA.

Table 3. Picloram liquid and granular formulations for absinth wormwood control, Medina, ND. (Messersmith and Lym).

Herbicide	Rate (lb/A)	Control 10 June 1981	Control 27 August 1981
		-----(%)-----	
Picloram S	0.25	100	100
Picloram S	0.5	100	100
Picloram 2% G	0.25	83	79
Picloram 2% G	0.5	98	98
Picloram 2% G	0.75	98	99
LSD (0.05)		4	7

Evaluation of chlorsulfuron and Dowco-290(M-3972) for Canada thistle and kochia control. Messersmith, Calvin G. and Rodney G. Lym. Chlorsulfuron and Dowco-290 were evaluated for Canada thistle control at Fargo, ND. The experiment was established on 17 June 1980 when the Canada thistle was 12 to 18 inches tall and in early to mid-bud growth stage, 74 F, 60% relative humidity, and the soil was dry. Plots were 8 by 20 ft in a randomized complete block design with four replications. The herbicides were applied with a backpack sprayer in 8.5 gpa water at 35 psi. Canada thistle and kochia control were based on percent stand reduction as compared to non-treated areas.

Chlorsulfuron provided very good control of Canada thistle for one year but the Canada thistle was becoming reestablished from surviving roots after 15 months (See Table). It was expected that chlorsulfuron would control Canada thistle for a longer time period, but the chlorsulfuron residual may have been reduced by the high organic matter content of the Fargo clay soil. Kochia control was low in chlorsulfuron treated plots in the year of treatment, but kochia did not grow the year following treatment. Dowco-290 at 0.75 lb/A gave excellent control of Canada thistle throughout the experiment but did not control kochia. The standard treatment of 2,4-D at 2 lb/A gave fair control of kochia in the year of treatment, but poor control of Canada thistle. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State University, Fargo.)

		Control				
		Canada thistle			Kochia	
Herbicide	Rate (lb/A)	22 Aug. 1980	21 July 1981	11 Sept. 1981	28 Aug. 1980	21 July 1981
		(%)				
Chlorsulfuron	0.25	95	85	10	30	100
Chlorsulfuron	0.375	97	98	55	28	100
Dowco-290[a](M-3972)	0.5	100	86	53	8	0
Dowco-290[a](M-3972)	0.75	100	95	94	0	0
2,4-D LVE	2.0	28	46	8	86	40
LSD (0.05)		11	26	45	30	35

[a] Dowco-290 is the monoethanolamine salt of 3,6-dichloropicolinic acid (3 lb/gal).

<u>Roller and wick application of picloram for Canada thistle control</u>. Lym, Rodney G. and Calvin G. Messersmith. An experiment was established to compare roller and wick application of picloram with standard broadcast treatments of dicamba, glyphosate and picloram for Canada thistle control. The experiment was established on 4 September 1980 near Carrington, ND under a clear sky at 56 F and 71% relative humidity. It had rained 0.14 inch the day before treatment and the soil was moist and 54 F at 1 inch. The Canada thistle stand was dense, the plants were 18 to 36 inches tall and had set seed. The picloram:water (v:v) solution concentration ranged from 1:3 to 1:11 and the roller and wick were adjusted so that the top 3/4 of most Canada thistle plants were treated. The broadcast applications were made with a tractor sprayer set to deliver 8.5 gpa with 35 psi. The treatments were applied in 10 by 330 ft strips and were replicated twice. Evaluation was based on percent stand reduction as compared to the control and data are reported in the table.

Type of application	Herbicide	Solution conc.[a]/Rate (lb/A)	Control 14 July 1981	Control 14 Sept. 1981
			(%)	(%)
Roller	Picloram	1:11	0	73
Roller	Picloram	1:7	25	80
Roller	Picloram	1:3	0	85
Wick	Picloram	1:11	0	20
Wick	Picloram	1:7	3	40
Wick	Picloram	1:3	25	70
Broadcast	Picloram	0.5	80	93
Broadcast	Picloram	1.0	100	99
Broadcast	Dicamba	2.0	0	5
Broadcast	Glyphosate	2.0	0	0
LSD (0.05)			36	22

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

The July 1981 evaluation indicated that the roller and wick treatments had provided poor Canada thistle control. The plants were stunted at all application rates but it appeared that they would recover. However, a dramatic increase in stand reduction was observed by the September 1981 evaluation for treatments applied by either applicator. The roller application of picloram at 1:7 and 1:3 provided 80 and 85% control, respectively. The wick application of picloram at 1:3 increased from 25 to 70% control with less dramatic increases at lower concentrations. Picloram at 0.5 and 1.0 lb/A gave 93 and 99% control, respectively, 1 year following treatment. No control was observed in plots treated with dicamba or glyphosate at 2.0 lb/A. The roller and wick applicators provided fair control of Canada thistle and are an option for treating large areas of infestation more economically. (Dep. of Agron., published with the approval of the Agric. Exp. Stn., North Dakota State University, Fargo.)

HOE-00661 for perennial weed control. Lym, Rodney G. and Calvin G. Messersmith. An experiment to screen HOE-00661 for control of several perennial weeds was established on 16 June 1981 in a lowland area near Carrington, ND. Perennial weed species present included Canada thistle, hemp dogbane, common milkweed, perennial sowthistle and quackgrass. Prickly lettuce was the only annual weed present in all plots. Absinth wormwood, Arkansas rose, water parsnip and western snowberry were scattered throughout the plot area. HOE-00661 was applied at various rates alone and in combination with a 28% nitrogen or 10% NH_4SO_4 solution at 1 gpa. Glyphosate and paraquat were applied at 0.75 lb/A. The surfactant WK was added to all treatments at 5% (v:v). Treatments were applied using a tractor sprayer that delivered 8.5 gpa at 35 psi. The plots were 15 by 50 ft in a randomized block design and replicated twice. The sky was partly cloudy, 75 F, 54% relative humidity and the soil temperature at one inch was 66 F.

Preliminary observations on 14 July 1981 showed that HOE-00661 at 0.75, 1.0 and 1.5 lb/A severely stunted all broadleaf species but the only species killed was water parsnip. All vegetation sprayed with paraquat had been burned down but perennials were beginning to resume growth. Most species treated with glyphosate were either controlled or very chlorotic.

Visual evaluation based on percent stand reduction as compared to the control were taken on 14 September 1981 and data are shown in the table. Quackgrass control by HOE-00661 seemed very good; however, paraquat treatments also indicated 60% quackgrass control. It was not clear whether the plants were being controlled by the herbicide or had not resumed growth after being burned down.

HOE-00661 at 0.75 lb/A plus nitrogen provided 90% perennial sowthistle and prickly lettuce control, but other HOE-00661 treatments had low weed control. Glyphosate gave excellent control of perennial sowthistle and prickly lettuce. Three months after application, HOE-00661 showed some control of water parsnip, prickly lettuce, perennial sowthistle and possibly quackgrass but further evaluations are needed. HOE-00661 did not control any other perennial weed species present.

Table. HOE-00661 control of various weeds - Casselton, ND. (Lym and Messersmith.

Herbicide	Rate	Species Qugr	Cath	Pest	Prle
	lb/A	(%)			
HOE-00661	0.5	50	10	0	0
HOE-00661	0.75	100	0	0	0
HOE-00661	1.0	90	10	0	0
HOE-00661	1.5	100	10	0	0
HOE-00661+N	0.5+50	75	10	45	45
HOE-00661+N	0.75+50	80	0	90	90
HOE-00661+NH SO	0.5+50	80	0	45	45
HOE-00661+NH SO	0.75+50	84	0	0	0
Glyphosate	0.75	90	0	90	100
Paraquat	0.75	60	0	90	0

Fall applied fallow herbicides, Fargo 1980-81. Treatments were applied October 24 to soil with 2000 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 1.1 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were heavy.

		Percent control				
	Rate	June 9		July 1		Total
Treatment	lb/A	Kocz	Fxtl	Kocz	Fxtl	Veg
Hexazinone	0.75	58	68	44	75	59
Chlorsulfuron	0.06	99	95	100	96	96
Chlorsulfuron	0.12	100	100	100	100	100
DPX-5648	0.015	100	100	100	100	100
DPX-5648	0.03	100	99	99	100	99
Cyanazine	2.5	96	58	96	33	65
Atrazine	1	99	30	94	15	54
Metribuzin	1	96	79	98	79	86
EL-187	0.5	88	60	65	61	61
EL-187	0.6	79	75	60	85	68
EL-187	0.75	100	93	100	95	97
EL-8778	1	96	73	84	74	79
EL-8778	1.2	95	68	83	81	82
EL-8778	1.5	98	83	86	93	89
Hexazinone+Metribuzin	0.5+0.5	98	85	89	91	88
Hexazinone+Metribuzin	0.5+0.75	96	86	91	92	90
Hexazinone+Chlorsulfuron	0.5+0.06	100	98	100	97	98
Hexazinone+DPX-5648	0.5+0.03	100	100	100	100	100
Hexazinone+Diuron	0.5+1	91	95	81	96	83
Buthidazole+Metribuzin	1+0.5	99	93	98	97	98
Cyanazine+Atrazine	2.5+0.5	95	73	88	59	69
Cyanazine+Atrazine+Propham	2.5+.5+3	85	91	95	65	79
Terbutryn+Atrazine	2+0.5	89	54	84	33	63
Chlorsulfuron+Metribuzin	0.06+0.5	100	98	100	99	99
EL-187+Atrazine	0.6+0.6	96	89	95	99	96
Pronamid	1.5	78	66	0	0	0
Control		0	0	0	0	0
Mean		90	78	82	75	78
High mean		100	100	100	100	100
Low mean		0	0	0	0	0
Coeff. of variation		11	19	17	19	16
LSD(1 Percent)		18	27	26	26	24
LSD(5 Percent)		13	20	20	20	18
No. of reps		4	4	4	4	4

Summary

Broadspectrum weed control was good with chlorsulfuron and DPX-5648 alone or in combination with other herbicides, metribuzin combinations with hexazinone or buthidazole and EL-187 at 0.75 lb/A alone or 0.6 lb/A with atrazine.

Fall applied fallow herbicides, Minot 1980-81. Treatments were applied October 7 to soil with 1500 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 1.5 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were heavy.

		Percent control									
	Rate	June 22				Total	July 21				Total
Treatment	lb/A	Fxtl	Ruth	Fipc	Kocz	Veg	Fxtl	Ruth	Fipc	Kocz	Veg
Hexazinone	0.75	83	64	100	35	68	83	53	95	8	59
Chlorsulfuron	0.06	86	81	100	100	85	75	96	100	98	89
Chlorsulfuron	0.12	91	89	100	100	92	91	98	100	100	96
DPX-5648	0.015	83	79	80	100	81	73	91	100	94	88
DPX-5648	0.03	90	85	100	100	91	91	98	100	99	96
Cyanazine	2.5	24	60	100	95	49	28	78	97	90	65
Atrazine	1	0	65	88	90	40	0	70	100	90	53
Metribuzin	1	41	73	100	98	65	0	65	97	90	51
EL-187	0.5	73	20	95	90	50	53	10	93	75	45
EL-187	0.6	84	55	100	83	69	63	28	95	71	55
EL-187	0.75	88	78	100	98	83	89	65	99	83	76
EL-8778	1	68	56	95	75	65	45	45	95	75	51
EL-8778	1.2	85	73	100	78	77	65	48	99	84	66
EL-8778	1.5	88	75	100	93	82	71	50	99	80	68
Hexazinone+Metribuzin	0.5+0.5	84	76	100	100	84	79	58	100	90	76
Hexazinone+Metribuzin	0.5+0.75	94	94	100	100	96	94	100	100	100	98
Hexazinone+Chlorsulfuron	0.5+0.06	93	88	100	100	91	91	98	100	99	97
Hexazinone+DPX-5648	0.5+0.03	90	91	100	100	93	94	98	100	98	97
Hexazinone+Diuron	0.5+1	90	71	100	55	73	86	53	93	55	69
Buthidazole+Metribuzin	1+0.5	98	95	100	100	98	94	83	100	97	92
Cyanazine+Atrazine	2.5+0.5	33	70	98	100	56	10	68	99	90	56
Cyanazine+Atrazine+Propham	2.5+.5+3	43	60	95	100	60	10	43	99	85	49
Terbutryn+Atrazine	2+0.5	5	50	80	88	36	0	48	95	85	45
Chlorsulfuron+Metribuzin	0.06+0.5	86	85	100	100	88	77	97	100	98	90
EL-187+Atrazine	0.6+0.6	80	83	100	93	83	43	79	100	91	74
Pronamid	1.5	30	18	50	0	15	0	0	0	0	0
Control		0	0	0	0	0	0	0	0	0	0
Mean		67	68	92	84	69	56	63	91	79	67
High mean		98	95	100	100	98	94	100	100	100	98
Low mean		0	0	0	0	0	0	0	0	0	0
Coeff. of variation		17	17	8	10	10	25	23	3	11	11
LSD(1 Percent)		21	21	20	24	13	26	28	5	15	14
LSD(5 Percent)		16	16	15	18	10	20	21	4	12	10
No. of reps		4	4	2	2	4	4	4	4	4	4

Summary

Broadspectrum weed control was good with chlorsulfuron or DPX-5648 alone or in combination with other herbicides and metribuzin combinations with hexazinone or buthidazole.

Fall applied fallow herbicides, Williston 1980-81. Treatments were applied October 8 to soil with 1500 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 1.9 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate to heavy.

		Percent control									
	Rate	June23					July 9				Total
Treatment	lb/A	Fxtl	Tamu	Tumu	Ruth	Kocz	Fxtl	Tamu	Ruth	Kocz	Veg
Hexazinone	0.75	35	100	100	100	100	92	100	93	85	91
Chlorsulfuron	0.06	89	100	100	94	100	90	100	100	100	96
Chlorsulfuron	0.12	94	100	100	99	100	94	100	100	100	98
DPX-5648	0.015	65	100	100	98	100	92	100	100	100	95
DPX-5648	0.03	90	100	100	96	100	100	100	100	100	100
Cyanazine	2.5	0	100	100	98	100	11	100	95	100	81
Atrazine	1	8	100	98	94	100	35	100	92	100	82
Metribuzin	1	10	100	100	100	100	35	100	95	100	82
EL-187	0.5	40	100	100	95	100	83	100	88	96	86
EL-187	0.6	53	100	100	95	100	89	100	90	100	89
EL-187	0.75	56	100	100	100	100	91	100	96	100	94
EL-8778	1	32	100	100	98	100	79	100	92	100	91
EL-8778	1.2	33	100	100	100	100	82	100	91	100	88
EL-8778	1.5	65	100	100	100	100	93	100	100	100	97
Hexazinone+Metribuzin	0.5+0.5	33	100	100	98	100	90	100	94	96	93
Hexazinone+Metribuzin	0.5+0.75	44	100	100	100	100	94	100	98	100	97
Hexazinone+Chlorsulfuron	0.5+0.06	75	100	100	100	100	98	100	100	100	99
Hexazinone+DPX-5648	0.5+0.03	79	100	100	98	100	99	100	100	100	99
Hexazinone+Diuron	0.5+1	96	100	100	96	100	98	100	98	100	98
Buthidazole+Metribuzin	1+0.5	80	100	100	100	100	97	100	100	100	98
Cyanazine+Atrazine	2.5+0.5	5	100	100	94	100	31	100	65	100	76
Cyanazine+Atrazine+Propham	2.5+.5+3	0	100	100	100	100	15	100	83	100	76
Terbutryn+Atrazine	2+0.5	5	100	100	93	90	15	98	84	95	75
Chlorsulfuron+Metribuzin	0.06+0.5	79	100	100	100	100	91	100	100	100	96
EL-187+Atrazine	0.6+0.6	60	100	100	100	100	91	100	100	99	95
Pronamid	1.5	0	60	60	68	60	0	0	0	0	0
Control		0	0	0	0	0	0	0	0	0	0
Mean		45	95	95	93	94	70	93	87	91	84
High mean		96	100	100	100	100	100	100	100	100	100
Low mean		0	0	0	0	0	0	0	0	0	0
Coeff. of variation		21	4	4	6	3	15	1	8	3	6
LSD(1 Percent)		18	7	7	10	8	19	2	13	5	9
LSD(5 Percent)		13	5	6	8	6	15	1	10	4	7
No. of reps		4	4	4	4	2	4	4	4	4	4

Summary

Broadspectrum weed control was good with hexazinone, chlorsulfuron, and DPX-5648 alone or in combination with other herbicides and EL-187 in combination with atrazine. Weed control was better with fall than early spring treatments.

Fall applied herbicides for chemical fallow, Hettinger County 1980-81. Treatments were applied October 28 in wheat stubble with a back pack sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.1 inch. The experimental design was a randomized complete block with 3 replications and experimental units were 8 by 20ft. Weed densities were light to moderate.

		------------Percent control------------				
	Rate	June8	July7	------August 5------		
	lb/A	--Total	veg--	Fxtl	Kocz	Wioa
Cyanazine	2.5	80	47	57	80	53
Cyanazine+Atrazine	2+0.5	77	60	80	93	20
Cyanazine+Metribuzin	2+0.5	87	72	93	93	58
Chlorsulfuron	0.06	84	73	100	100	50
Hexazinone	0.5	83	45	98	82	62
Hexazinone+Atrazine	0.5+0.5	91	83	100	90	88
Hexazinone+Metribuzin	0.5+0.5	88	87	100	100	91
Hexazinone+Diuron	0.5+1	85	57	100	83	80
Hexazinone+Chlorsulfuron	0.5+0.06	94	85	100	100	89
Control		0	0	0	0	0
Mean		77	61	83	82	59
High mean		94	87	100	100	91
Low mean		0	0	0	0	0
Coeff. of variation		8	24	15	11	39
LSD(1 Percent)		14	34	28	21	54
LSD(5 Percent)		11	25	21	15	39
No. of reps		3	3	3	3	3

Summary

Broadspectrum weed control was good with hexazinone in combination with atrazine, metribuzin or chlorsulfuron and fair in combination with diuron.

Fall applied atrazine and metribuzin for chemical fallow, Hettinger County 1980-81. Treatments were applied October 28 in wheat stubble with a back pack sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.1 inch. The experimental design was a randomized complete block with 3 replications and experimental units were 8 by 20 ft. Weed densities were light to moderate.

		Percent control				
	Rate	June8	July7	August 5		
Treatment	lb/A	--Total	veg--	Fxtl	Kocz	Wioa
Atrazine+Metribuzin	0.5+0.5	72	37	77	98	37
Atrazine+Metribuzin	0.75+0.5	75	52	87	98	53
Atrazine	0.5	38	12	0	87	0
Atrazine	0.75	35	10	7	78	7
Metribuzin	0.5	45	8	40	87	0
Terbutryn	1.5	50	17	23	17	25
Control		0	0	0	0	0
Mean		45	19	33	66	17
High mean		75	52	87	98	53
Low mean		0	0	0	0	0
Coeff. of variation		18	78	56	22	86
LSD(1 Percent)		20	37	47	37	37
LSD(5 Percent)		14	27	33	26	27
No. of reps		3	3	3	3	3

Summary

No treatment adequately controlled wild oat. Weed control was better with atrazine - metribuzin combinations than with either herbicide alone.

Fall applied herbicides for chemical fallow, Golden Valley 1980-81. Treatments were applied October 27 in wheat stubble with a back pack sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.5 inch. The experimental design was a randomized complete block with 3 replications and experimental units were 8 by 20 ft. Primary weed species present were green foxtail tansy mustard and Russian thistle.

Treatment	Rate lb/A	% Control Total veg --July2--
Cyanazine	2.5	12
Cyanazine+Atrazine	2+0.5	60
Cyanazine+Metribuzin	2+0.5	63
Chlorsulfuron	0.06	83
Hexazinone	0.5	85
Hexazinone+Atrazine	0.5+0.5	88
Hexazinone+Metribuzin	0.5+0.5	83
Hexazinone+Diuron	0.5+1	92
Hexazinone+Chlorsufuron	0.5+0.06	92
Control		0
Mean		66
High mean		92
Low mean		0
Coeff. of variation		11
LSD(1 Percent)		16
LSD(5 Percent)		12
No. of reps		3

Summary

Weed control was good with chlorsulfuron and hexazinone alone or in combination with other herbicides.

Fall applied herbicides for chemical fallow, Mohall 1980-81. Treatments were applied November 6 in wheat stubble with a bicycle wheel sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totalled 0.8 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were heavy.

Treatment	Rate lb/A	----Percent control	July 22----	
		Grft	Tamu	Fach
Cyanazine	2.5	49	100	100
Cyanazine+Atrazine	2+.5	56	100	100
Cyanazine+Metribuzin	2+.5	88	100	100
Chlorsulfuron	0.06	100	100	100
Hexazinone	.5	88	100	100
Hexazinone+Atrazine	.5+.5	97	100	100
Hexazinone+Metribuzin	.5+.5	95	100	99
Hexazinone+Diuron	.5+1	96	100	100
Hexazinone+Chlorsulfuron	.5+0.6	100	100	100
EL-187	.6	69	83	98
EL-8778	1.2	56	100	100
Control		0	0	0
Mean		74	90	91
High mean		100	100	100
Low mean		0	0	0
Coeff. of variation		21	11	2
LSD(1 Percent)		30	19	3
LSD(5 Percent)		22	14	2
No. of reps		4	4	4

Summary

False chamomile and tansy mustard control was good to excellent with all treatments. Green foxtail control was good with treatments containing chlorsulfuron or hexazinone.

Fall applied herbicides for chemical fallow, Renville Co. 1980-81. Treatments were applied November 6 in wheat stubble with a bicycle wheel sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totalled 0.8 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate to heavy.

Treatment	Rate lb/A	----Percent control July 8---- Grft	Kocz	Fach
Cyanazine	2.5	15	53	60
Cyanazine+Atrazine	2+0.5	11	72	99
Cyanazine+Metribuzin	2+0.5	56	92	99
Chlorsulfuron	0.06	97	100	100
Hexazinone	0.5	83	46	100
Hexazinone+Atrazine	0.5+0.5	89	62	99
Hexazinone+Metribuzin	0.5+0.5	95	95	100
Hexazinone+Diuron	0.5+1	94	79	99
Hexazinone+Chlorsulfuron	0.5+0.06	99	100	100
EL-187	0.6	53	62	99
EL-8778	1.2	26	50	10
Control		0	0	0
Mean		60	68	80
High mean		99	100	100
Low mean		0	0	0
Coeff. of variation		21	36	20
LSD(1 Percent)		24	46	50
LSD(5 Percent)		18	35	36
No. of reps		4	4	2

Summary

False chamomile control was excellent with all treatments except cyanazine or EL-187. Kochia control was good with treatments containing chlorsulfuron or metribuzin and green foxtail control good with chlorsulfuron or hexazinone treatments.

Herbicides for weed control in fallow, Devils Lake. Preemergence treatments were applied on undisturbed wheat stubble on October 20, 1980 (F) or April 20, 1981 to 2 to 4 inch weeds. Glyphosate at 0.2 lb/A was applied as a cleanup operation on June 22 (Ju), July (Jy) and August (Au) to previously treated plots. Treatments were applied in 17 gpa at 30 psi to sandy loam soil with pH 8.0 and 4% organic matter. Precipitation for a 2 week period totaled 1.2 and 1.1 inch following fall and spring applications, respectively. June, July and August precipitation was near normal. The experiment was a randomized complete block with five replications.

Treatment	Rate lb/A	Weed control Kocz	Grft	Soil moisture (%)
		-----(%)-----		
Cyanazine+Atrazine F+(glyp Ju,Jy,Au)	2+0.5+(0.2)	100	100	12.5
Cyanazine+atrazine F+(glyp Ju,Jy)	2+0.5+(0.2)	100	94	----[a]
Cyanazine+atrazine F+(glyp Jy)	2+0.5+(0.2)	100	85	12.2
Cyanazine+atrazine F	2+0.5	99	30	11.4
Atrazine F+(glyp Ju,Jy,Au)	0.75+(0.2)	100	99	12.4
Atrazine F+(glyp Ju,Jy)	0.75+(0.2)	100	95	----
Atrazine F+(glyp Jy)	0.75+(0.2)	98	90	12.0
Atrazine F	0.75	90	20	11.1
Chlorsulfuron F+(glyp Ju,Jy,Au)	0.06+(0.2)	100	100	12.5
Chlorsulfuron F+(glyp Ju,Jy)	0.06+(0.2)	100	100	----
Chlorsulfuron F+(glyp Jy)	0.06+(0.2)	100	99	12.5
Chlorsulfuron F	0.06	100	90	12.3
Chlorsulfuron F+(glyp Ju,Jy,Au)	0.03+(0.2)	100	100	12.7
Chlorsulfuron F+(glyp Ju,Jy)	0.03+(0.2)	100	100	----
Chlorsulfuron F+(glyp Jy)	0.03+(0.2)	100	99	12.6
Chlorsulfuron F	0.03	100	78	12.2
Cyanazine+atrazine S+(glyp Ju,Jy,Au)	2+0.5+(0.2)	100	100	12.5
Cyanazine+atrazine S+(glyp Ju,Jy)	2+0.5+(0.2)			
Cyanazine+Atrazine S+(glyp Ju,Jy)	2+0.5+(0.2)	100	97	----
Cyanazine+atrazine S+(glyp Jy)	2+0.5+(0..2)	100	83	12.1
Cyanazine+atrazine S	2+0.5	95	40	11.5
Chlorsulfuron S+(glyp Ju,Jy,Au)	0.06+(0.2)	100	100	12.7
Chlorsulfuron S+(glyp Ju,Jy)	0.06+(0.2)	100	100	----
Chlorsulfuron S+(glyp Jy)	0.06+(0.2)	100	99	12.5
Chlorsulfuron S	0.06	99	86	12.3
Chlorsulfuron S+(glyp Ju,Jy,Au)	0.03+(0.2)	100	100	12.4
Chlorsulfuron S+(glyp Ju,Jy)	0.03+(0.2)	100	100	----
Chlorsulfuron S+(glyp Jy)	0.03+(0.2)	100	98	12.5
Chlorsulfuron S	0.03	100	85	12.2
Glyphosate P+(glyp Ju,Jy,Au)	0.4+(0.2)	97	100	12.3
Glyphosate P+(glyp Ju,Jy)	0.4+(0.2)	95	94	----
Glyphosate P+(glyp Jy)	0.4+(0.2)	85	88	12.2
Glyphosate P	0.4	64	55	11.4

[a] Soil moisture values were not determined because weed control was similar to Ju,Jy,Au cleanup treatment.

Summary

Kochia control was good to excellent with all preemergence treatments regardless if applied in the fall or early spring. A single application of glyphosate in July to preemergence treatments for green foxtail control was only slightly less effective than multiple applications in June and July or June, July and August. Soil moisture levels related to weed control.

Spring preemergence fallow herbicides, Fargo 1981. Treatments were applied March 27 to soil with 2000 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 0.2 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate to heavy.

		Percent control				
	Rate	June 9		July 6		Total
Treatment	lb/A	Kocz	Fxtl	Kocz	Fxtl	Veg
Hexazinone	0.5	90	88	89	65	78
Chlorsulfuron	0.03	99	96	95	90	89
Chlorsulfuron	0.06	100	94	94	96	92
Chlorsulfuron	0.12	100	100	100	100	98
DPX-5648	0.004	99	95	97	94	94
DPX-5648	0.008	100	100	100	98	97
DPX-5648	0.015	100	98	100	99	96
Cyanazine-W	2	98	73	85	51	68
Atrazine-W	0.75	99	70	90	41	68
Metribuzin-W	0.75	93	84	80	70	73
EL-187	0.4	83	61	51	46	60
EL-187	0.5	68	74	58	80	66
EL-187	0.6	100	93	95	88	89
EL-8778	0.8	83	84	65	81	72
EL-8778	1	96	93	88	91	85
EL-8778	1.2	95	94	91	95	89
MC10108	1	100	83	88	38	50
MC10108	1.5	93	73	68	35	50
MC10108	2	83	75	61	40	50
R-40244	0.5	76	56	64	5	31
R-40244	1	98	60	93	5	48
Hexa+Metr-W	0.5+0.5	100	95	100	96	95
Hexa+Chlorsulfuron	0.5+0.06	100	98	99	97	95
Hexa+DPX-5648	0.5+0.015	100	95	97	95	96
Hexa+Diuron	0.5+1.0	89	76	71	81	73
Buthidazole+Metr-W	1.0+0.5	100	100	99	97	96
EL-187+Atra-W	0.5+0.5	85	75	76	83	75
Cyan-W+Atra-W	2+0.5	96	75	89	65	73
Terbutryn+Atra-W	1.5+0.5	100	80	100	42	72
Clsu+DPX-5648	0.06+0.008	100	100	100	100	99
Clsu+DPX-5648	0.06+0.015	100	99	100	100	99
Chlorsulfuron+Metr-W	0.06+0.5	100	100	100	100	99
Oxyfluorfen	0.5	99	86	94	53	73
Hexa+Oxyfluorfen	0.5+0.5	83	90	96	90	91
Control		0	0	0	0	0
Mean		91	83	85	72	76
High mean		100	100	100	100	99
Low mean		0	0	0	0	0
Coeff. of variation		12	18	25	25	18
LSD(1 Percent)		21	28	39	34	26
LSD(5 Percent)		16	21	30	25	20
No. of reps		4	4	4	4	4

Summary

Kochia and foxtail control was good with chlorsulfuron and DPX-5648 alone or in combination with other herbicides, EL-187 at 0.6lb/A alone or in combination with atrazine, and metribuzin combinations with hexazinone or buthidazole.

Spring preemergence fallow herbicides, Minot 1981. Treatments were applied April 7 to soil with 1500 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 0.1 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate to heavy.

		Percent control						
	Rate	June22		Total	July21			Total
Treatment	lb/A	Fxtl	Ruth	Veg	Fxtl	Ruth	Kocz	Veg
Hexazinone	0.5	89	44	55	86	60	0	50
Chlorsulfuron	0.03	90	78	82	71	75	80	76
Chlorsulfuron	0.06	96	78	86	96	82	90	91
Chlorsulfuron	0.12	93	89	91	99	85	95	92
DPX-5648	0.004	88	36	55	50	35	53	45
DPX-5648	0.008	84	60	75	80	58	67	66
DPX-5648	0.015	90	71	75	73	65	80	71
Cyanazine-W	2	59	49	53	13	60	93	54
Atrazine-W	0.75	10	46	28	0	35	85	38
Metribuzin-W	0.75	81	79	79	35	58	88	58
EL-187	0.4	85	21	48	63	38	63	55
EL-187	0.5	84	23	51	60	35	55	49
EL-187	0.6	85	28	55	76	20	28	42
EL-8778	0.8	68	23	43	48	40	70	53
EL-8778	1	78	28	51	70	43	45	55
EL-8778	1.2	84	38	54	88	56	56	65
MC10108	1	74	48	58	68	18	18	39
MC10108	1.5	87	75	79	71	50	60	61
MC10108	2	84	80	81	79	59	65	67
R-40244	0.5	38	23	29	0	25	78	34
R-40244	1	60	71	69	10	40	91	42
Hexa+Metr-W	0.5+0.5	93	60	73	89	41	53	62
Hexa+Chlorsulfuron	0.5+0.06	95	86	89	99	85	90	92
Hexa+DPX-5648	0.5+0.015	95	83	88	93	70	73	81
Hexa+Diuron	0.5+1.0	94	21	50	92	15	46	48
Buthidazole+Metr-W	1.0+0.5	95	59	76	94	64	95	81
EL-187+Atra-W	0.5+0.5	84	29	46	75	28	64	50
Cyan-W+Atra-W	2+0.5	88	43	61	66	55	79	62
Terbutryn+Atra-W	1.5+0.5	16	54	38	0	30	90	40
Clsu+DPX-5648	0.06+0.008	97	90	94	96	86	99	92
Clsu+DPX-5648	0.06+0.015	97	91	94	97	85	95	92
Chlorsulfuron+Metr-W	0.06+0.5	95	89	93	96	79	97	88
Oxyfluorfen	0.5	46	15	30	5	20	49	26
Hexa+Oxyfluorfen	0.5+0.5	93	29	55	90	20	38	48
Control		0	0	0	0	0	0	0
Mean		77	52	62	64	49	66	59
High mean		97	91	94	99	86	99	92
Low mean		0	0	0	0	0	0	0
Coeff. of variation		14	39	17	21	47	33	21
LSD(1 Percent)		20	37	19	25	42	40	23
LSD(5 Percent)		15	28	15	19	32	31	17
No. of reps		4	4	4	4	4	4	4

Summary

Broadspectrum weed control was good with chlorsulfuron alone or in combination with other herbicides at rates of 0.06 lb/A or higher.

Spring preemergence fallow herbicides, Williston 1981. Treatments were applied April 8 to soil with 1500 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 0.1 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 feet. Weed densities were moderate.

		Percent control								
	Rate	June 22				July 9				Total
Treatment	lb/A	Fxtl	Tamu	Ruth	Kocz	Fxtl	Tamu	Ruth	Kocz	Veg
Hexazinone	0.5	46	30	45	0	91	48	65	28	59
Chlorsulfuron	0.03	90	91	85	69	90	93	75	83	87
Chlorsulfuron	0.06	91	100	93	69	98	100	91	78	91
Chlorsulfuron	0.12	99	100	99	100	100	100	98	99	99
DPX-5648	0.004	86	73	73	33	93	80	89	49	70
DPX-5648	0.008	81	58	73	40	92	84	85	55	71
DPX-5648	0.015	91	79	75	58	95	81	88	63	75
Cyanazine-W	2	55	66	70	45	50	56	64	68	50
Atrazine-W	0.75	0	50	68	55	39	41	68	58	51
Metribuzin-W	0.75	45	84	88	96	40	89	91	98	82
EL-187	0.4	49	65	10	43	93	55	29	55	58
EL-187	0.5	75	58	28	60	90	48	28	48	53
EL-187	0.6	79	66	33	91	96	63	45	65	67
EL-8778	0.8	64	52	50	30	92	74	66	46	62
EL-8778	1	75	69	56	49	93	74	78	70	75
EL-8778	1.2	86	75	74	76	95	81	81	74	77
MC10108	1	90	75	82	58	80	80	76	78	72
MC10108	1.5	96	96	96	68	92	98	87	68	75
MC10108	2	98	100	96	79	96	100	89	55	86
R-40244	0.5	59	68	40	94	25	90	23	88	54
R-40244	1	93	80	93	94	86	70	94	96	84
Hexa+Metr-W	0.5+0.5	75	90	96	96	97	99	98	99	97
Hexa+Chlorsulfuron	0.5+0.06	96	99	89	63	99	99	91	86	92
Hexa+DPX-5648	0.5+0.015	94	76	78	69	98	86	93	79	86
Hexa+Diuron	0.5+1.0	98	70	70	73	99	94	76	73	80
Buthidazole+Metr-W	1.0+0.5	98	99	95	96	100	100	97	98	97
EL-187+Atrazine-W	0.5+0.5	84	70	79	90	96	82	84	80	83
Cyan-W+Atra-W	2+0.5	81	68	83	89	86	69	83	93	82
Terbutryn+Atra-W	1.5+0.5	30	60	79	95	41	75	86	97	74
Clsu+DPX-5648	0.06+0.008	99	100	96	90	100	100	95	91	95
Clsu+DPX-5648	0.06+0.015	100	100	99	99	100	100	99	98	99
Chlorsulfuron+Metr-W	0.06+0.5	98	100	99	99	100	100	99	98	99
Oxyfluorfen	0.5	88	84	79	60	59	85	63	48	59
Hexa+Oxyfluorfen	0.5+0.5	99	100	89	75	99	98	84	76	85
Control		0	0	0	0	0	0	0	0	0
Mean		77	76	73	68	83	80	76	72	75
High mean		100	100	99	100	100	100	99	99	99
Low mean		0	0	0	0	0	0	0	0	0
Coeff. of variation		10	25	20	28	12	22	20	28	13
LSD(1 Percent)		14	36	27	36	19	32	27	38	18
LSD(5 Percent)		10	27	20	27	14	25	21	29	14
No. of reps		4	4	4	4	4	4	4	4	4

Summary

Broadspectrum weed control was good with chlorsulfuron alone or in combination with other herbicides and metribuzin combinations with hexazinone or buthidazole.

Spring preemergence fallow herbicides, Grant County 1981. Treatments were applied April 30 in wheat stubble with a back pack sprayer delivering 17gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.2 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were variable.

		------------Percent control------------				
	Rate	June8	July24	-------August 5-Total		
Treatment	lb/A	-Total Veg-		Fxtl	Bdlf	Veg
Cyanazine	2	70	58	34	85	59
Cyanazine+Atrazine	2+0.5	64	55	28	91	58
Cyanazine+Metribuzin	2+0.5	79	65	48	95	68
Chlorsulfuron	0.06	86	86	98	100	99
Hexazinone	0.5	73	76	88	80	84
Hexazinone+Atrazine	0.5+0.5	86	91	93	98	95
Hexazinone+Metribuzin	0.5+0.5	88	90	89	95	92
Hexazinone+Chlorsulfuron	0.5+0.06	95	96	100	100	100
DPX-5648	0.015	76	74	63	94	76
Chlorsulfuron+DPX-5648	0.06+0.008	92	95	97	100	99
EL-187	0.5	60	49	33	80	54
EL-8778	1	59	53	40	84	59
MC-10108	2	97	91	94	99	97
Terbutryn+Metolachlor	1.5+3	63	58	30	80	56
Terbutryn+Atrazine	1.5+0.5	63	53	23	96	58
Control		0	0	0	0	0
Mean		72	68	60	86	72
High mean		97	96	100	100	100
Low mean		0	0	0	0	0
Coeff. of variation		13	13	25	9	10
LSD(1 Percent)		18	16	28	14	14
LSD(5 Percent)		14	12	21	11	10
No. of reps		4	4	4	4	4

Summary

Season long weed control was good with chlorsulfuron alone or in combination with other herbicides, the methyl ester of acifluorfen (MC10108) and hexazinone in combination with atrazine or metribuzin.

Spring applied fallow herbicides, Hettinger County 1981. Treatments were applied April 30 in wheat stubble with a back pack sprayer delivering 17gpa at 35 psi. Precipitation for a 2 week period following application totaled 0.5 inch. The experimental design was a randomized complete block with 3 replications and experimental units were 8 by 20 ft. Weed densities were moderate.

		-----------Percent control-----------				
	Rate	June8	July7	------August 5------		
Treatment	lb/A	--Total	veg--	Fxtl	Kocz	Wioa
Cyanazine	2	43	20	33	75	0
Cyanazine+Atrazine	2+0.5	58	35	72	93	10
Cyanazine+Metribuzin	2+0.5	65	37	87	95	20
Chlorsulfuron	0.06	47	40	100	100	0
Hexazinone	0.5	45	35	98	13	58
Hexazinone+Atrazine	0.5+0.5	62	47	78	55	53
Hexazinone+Metribuzin	0.5+0.5	68	48	100	85	50
Hexazinone+Chlorsulfuron	0.5+0.06	67	60	100	100	47
DPX-5648	0.015	83	65	97	20	67
Chlorsulfuron+DPX-5648	0.06+0.008	87	70	100	100	62
EL-187	0.5	53	43	73	40	10
EL-8778	1	60	40	77	73	7
MC-10108	2	80	57	100	100	30
Terbutryn+Metolachlor	1.5+3	37	28	77	30	0
Terbutryn+Atrazine	1.5+0.5	63	40	40	95	23
Control		0	0	0	0	0
Mean		57	42	77	67	27
High mean		87	70	100	100	67
Low mean		0	0	0	0	0
Coeff. of variation		25	30	19	31	62
LSD(1 Percent)		32	28	33	46	38
LSD(5 Percent)		24	21	25	34	28
No. of reps		3	3	3	3	3

Summary

No treatment provided adequate control of wild oat. Foxtail and kochia control was good with chlorsulfuron alone or in combination with hexazinone and DPX-5648, metribuzin combinations with cyanazine or hexazinone, or the methyl ester of acifluorfen (MC10108).

Spring applied herbicides for chemical fallow, Mohall 1981. Treatments were applied May 11 in wheat stubble with a bicycle wheel sprayer delivering 17 gpa at 35 psi. First rainfall was 0.7 inch over a 3 day period from May 22 to 24. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate to heavy.

Treatment	Rate lb/A	---Percent Grft	control July 22--- Tamu	Fach
Cyanazine-W	2	83	18	65
Cyanazine-W+Atrazine-W	2+0.5	80	53	69
Cyanazine-W+Metribuzin-W	2+0.5	93	85	68
Chlorsulfuron	0.06	100	99	92
Hexazinone	0.5	94	81	84
Hexazinone+Atrazine-W	0.5+0.5	98	96	100
Hexazinone+Metribuzin-W	0.5+0.5	98	96	92
Hexazinone+Chlorsulfuron	0.5+0.06	100	99	100
DPX-5648	0.015	100	85	81
Chlorsulfuron+DPX-5648	0.06+0.008	100	100	100
EL-187	0.5	98	13	66
EL-8778	1	96	13	65
MC-10108	2	94	91	68
Terbutryn+Metolachlor	1.5+3	92	30	80
Terbutryn+Atrazine-W	1.5+0.5	76	20	71
Control		0	0	0
Mean		87	61	75
High mean		100	100	100
Low mean		0	0	0
Coeff. of variation		9	21	16
LSD(1 Percent)		14	24	22
LSD(5 Percent)		11	18	17
No. of reps		4	4	4

Summary

Broad spectrum weed control was excellent with chlorsulfuron alone or with hexazinone in combination with atrazine or metribuzin and good with hexazinone or DPX-5648 alone.

Postemergence fallow herbicides, Fargo 1981. Treatments were applied May 14 to 1 to 2 inch kochia and sunflower (VSF) using a bicycle wheel sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 3.5 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate.

		----------Percent	control----------			
	Rate	---June 1---		-------July 1-------		
Treatment	lb/A	Kocz	VSF	Kocz	Fxtl	VSF
Paraquat+Cyanazine-W	0.5+2	100	96	85	49	70
Paraquat+Metribuzin-F	0.5+0.5	100	97	97	86	87
Paraquat+Atrazine-W	0.5+0.5	100	91	73	36	38
Paraquat+Chlorsulfuron	0.5+0.03	100	95	97	99	87
Paraquat+Chlorsulfuron	0.5+0.06	100	95	97	99	97
Paraquat+DPX-5648	0.5+0.004	99	95	94	92	79
Paraquat+DPX-5648	0.5+0.008	100	89	92	95	58
Terbutryn	2	100	93	74	36	56
Terbutryn+Cyanazine-W	1.5+1.5	100	98	96	69	84
Terbutryn+Dicamba	1.5+0.25	100	93	91	20	85
Terbutryn+Meto&Atra	1.5+.84	100	93	88	82	63
Terbutryn+Metribuzin-F	1.5+0.5	100	98	99	89	95
Terbutryn+Metolachlor	1.5+3	100	99	79	73	71
Terbutryn+Meto+Metr-F	1.5+3+0.5	100	100	97	87	93
Terbutryn+Chlorsulfuron	1.5+0.03	100	99	99	99	99
Terbutryn+Hexazinone	1.5+0.5	100	94	91	77	70
R-40244	0.5	100	84	91	28	23
R-40244	1	100	96	95	13	64
MC10108	1	100	93	90	64	70
MC10108	1.5	100	93	96	78	66
MC10108	2	100	100	98	94	95
Control		0	0	0	0	0
Mean		95	90	87	66	70
High mean		100	100	99	99	99
Low mean		0	0	0	0	0
Coeff. of variation		1	6	6	28	29
LSD(1 Percent)		1	11	10	35	37
LSD(5 Percent)		1	8	8	26	28
No. of reps		4	4	4	4	4

Summary

Broadspectrum weed control was good with the methyl ester of acifluorfen (MC10108) at 2 lb/A, paraquat combinations with metribuzin and chlorsulfuron, or terbutryn combinations with metribuzin and chlorsulfuron.

Postemergence fallow herbicides, Minot 1981. Treatments were applied May 20 to 2 to 4 inch weeds using a bicycle wheel sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 2.1 in. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 feet. Weed densities were moderate to heavy.

		Percent control						
	Rate	June 23		Total	July 21			Total
Treatment	lb/A	Fxtl	Ruth	Veg	Fxtl	Ruth	Kocz	Veg
Paraquat+Cyanazine-W	0.5+2	95	94	93	86	83	96	86
Paraquat+Metribuzin-F	0.5+0.5	97	98	97	86	100	100	93
Paraquat+Atrazine-W	0.5+0.5	0	96	43	0	96	95	64
Paraquat+Chlorsulfuron	0.5+0.03	91	89	90	95	100	99	97
Paraquat+Chlorsulfuron	0.5+0.06	91	85	90	99	99	99	99
Paraquat+DPX-5648	0.5+0.004	93	84	87	95	94	87	92
Paraquat+DPX-5648	0.5+0.008	80	83	81	87	90	88	83
Terbutryn	2	23	92	51	5	94	94	64
Terbutryn+Cyanazine-W	1.5+1.5	91	93	91	73	94	96	85
Terbutryn+Dicamba	1.5+0.25	25	99	61	25	99	99	74
Terbutryn+Meto&Atra	1.5+.84	98	99	98	96	95	99	97
Terbutryn+Metribuzin-F	1.5+0.5	95	97	96	51	99	99	77
Terbutryn+Metolachlor	1.5+3	98	97	97	83	88	94	89
Terbutryn+Meto+Metr-F	1.5+3+0.5	97	97	97	92	97	99	96
Terbutryn+Chlorsulfuron	1.5+0.03	97	96	97	98	100	100	99
Terbutryn+Hexazinone	1.5+0.5	96	96	96	92	99	99	96
R-40244	0.5	33	68	49	0	78	85	54
R-40244	1	83	88	83	63	80	93	80
MC10108	1	69	86	76	38	78	79	66
MC10108	1.5	98	97	98	83	90	97	88
MC10108	2	90	97	93	81	93	96	87
Control		0	0	0	0	0	0	0
Mean		74	88	80	65	88	90	80
High mean		98	99	98	99	100	100	99
Low mean		0	0	0	0	0	0	0
Coeff. of variation		20	9	11	26	8	5	10
LSD(1 Percent)		28	14	17	31	13	8	15
LSD(5 Percent)		21	11	13	24	10	6	11
No. of reps		4	4	4	4	4	4	4

Summary

Broadspectrum weed control was good with the methyl ester of acifluorfen (MC10108) at 1.5 and 2lb/A, paraquat combinations with chlorsulfuron and DPX-5648, or terbutryn combination with chlorsulfuron, hexazinone and metolachlor.

Postemergence fallow herbicides, Williston 1981. Treatments were applied May 21 to 2 to 4 inch weeds using a bicycle wheel sprayer delivering 17 gpa at 35 psi. Precipitation for a 2 week period following application totaled 2.9 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate.

		Percent control								
	Rate	June 22				July 9				Total
Treatment	lb/A	Fxtl	Tamu	Ruth	Kocz	Fxtl	Tamu	Ruth	Kocz	Veg
Paraquat+Cyanazine-W	0.5+2	93	100	100	100	97	100	100	100	97
Paraquat+Metribuzin-F	0.5+0.5	60	100	100	100	35	100	98	100	80
Paraquat+Atrazine-W	0.5+0.5	0	81	100	100	10	71	73	94	70
Paraquat+Chlorsulfuron	0.5+0.03	96	100	100	100	96	100	99	100	98
Paraquat+Chlorsulfuron	0.5+0.06	95	100	100	100	99	100	100	100	99
Paraquat+DPX-5648	0.5+0.004	91	100	98	100	95	98	98	93	95
Paraquat+DPX-5648	0.5+0.008	81	93	98	100	96	92	100	90	92
Terbutryn	2	23	85	100	95	15	66	91	100	71
Terbutryn+Cyanazine-W	1.5+1.5	85	100	100	100	81	100	100	100	96
Terbutryn+Dicamba	1.5+0.25	5	95	100	100	3	91	88	100	76
Terbutryn+Meto&Atra	1.5+.84	91	98	100	100	97	98	94	100	97
Terbutryn+Metribuzin-F	1.5+0.5	76	88	100	100	48	63	100	96	77
Terbutryn+Metolachlor	1.5+3	90	80	98	98	95	71	82	90	87
Terbutryn+Meto+Metr-F	1.5+3+0.5	94	96	100	100	96	95	100	100	97
Terbutryn+Chlorsulfuron	1.5+0.03	93	100	100	100	94	100	100	100	98
Terbutryn+Hexazinone	1.5+0.5	89	100	100	100	99	100	100	99	99
R-40244	0.5	86	98	100	94	65	98	78	94	80
R-40244	1	94	90	100	95	96	81	75	98	86
MC10108	1	89	95	96	91	76	91	88	74	81
MC10108	1.5	94	98	99	93	89	100	96	87	92
MC10108	2	94	100	100	100	89	100	100	93	91
Control		0	0	0	0	0	0	0	0	0
Mean		73	91	95	94	71	87	89	91	84
High mean		96	100	100	100	99	100	100	100	99
Low mean		0	0	0	0	0	0	0	0	0
Coeff. of variation		11	9	2	5	19	17	9	5	9
LSD(1 Percent)		15	15	4	9	25	27	15	9	13
LSD(5 Percent)		11	12	3	7	19	20	11	7	10
No. of reps		4	4	4	4	4	4	4	4	4

Summary

Broadspectrum weed control was good with the methyl ester of acifluorfen (MC10108) at 1.5 to 2 lb/A, paraquat combinations with cyanazine, chlorsulfuron and DPX-5648, or terbutryn combinations with cyanazine, chlorsulfuron, hexazinone and metolachlor.

Cyanazine for chemical fallow, Fargo 1981. Treatments were applied May 18 to 1.5 to 2 inch kochia and sunflower using a bicycle wheel sprayer delivering 17 gpa at 35 psi. First rain after application was 3.3 inch over a 3 day period of May 22 to 24. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were heavy.

Treatment	Rate lb/A	Percent control --June 1-- Kocz	VSF	------July 6------ Kocz	Fxtl	VSF
Cyan-DF+Atrazine-W+2,4-D	2+0.4+0.5	98	97	79	60	83
Cyan-DF+Atrazine-W+2,4-D	3+0.6+0.5	100	100	91	63	91
Cyan-W+Atrazine-W+2,4-D	2+0.4+0.5	100	96	83	44	85
Cyan-W+Atrazine-W+2,4-D	3+0.6+0.5	100	99	88	75	88
Cyan-W+Atrazine-W+Glyphosate	2+0.4+0.37	100	98	84	39	80
Cyan-LF+Atra-W+Glyphosate	2+0.4+0.37	100	98	86	39	85
Cyan-W+Atrazine-W+Paraquat	2+0.4+0.5	100	97	84	48	86
Cyan-W+Atrazine-W+LOTM	2+0.4+0.25G	100	100	81	49	91
Control	0	0	0	0	0	0
Mean		89	87	75	46	77
High mean		100	100	91	75	91
Low mean		0	0	0	0	0
Coeff. of variation		1	3	11	35	8
LSD(1 Percent)		2	5	17	32	13
LSD(5 Percent)		1	4	12	23	9
No. of reps		4	4	4	4	4

Summary

Burndown of kochia and volunteer sunflower was excellent with all treatments. Residual weed control with cyanazine plus atrazine was similar regardless of cyanazine formulation.

Cyanazine for chemical fallow, Minot 1981. Treatments were applied May 6 to 1 to 1.5 inch Russian thistle using a bicycle wheel sprayer delivering 17 gpa at 35 psi. Rainfall for a 2 week period following application totaled 0.1 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate to heavy.

		---------Percent	control---------					
	Rate	-June 22-Total			------July 21-Total			
Treatment	lb/A	Fxtl	Ruth	Veg	Fxtl	Ruth	Kocz	Veg
Cyan-DF+Atrazine-W+2,4-D	2+0.4+0.5	91	91	91	66	79	91	78
Cyan-DF+Atrazine-W+2,4-D	3+0.6+0.5	98	98	98	86	91	95	91
Cyan-W+Atrazine-W+2,4-D	2+0.4+0.5	90	94	94	68	84	94	82
Cyan-W+Atrazine-W+2,4-D	3+0.6+0.5	96	97	97	85	89	95	90
Cyan-W+Atrazine-W+Glyphosate	2+0.4+0.37	86	89	87	61	76	91	75
Cyan-LF+Atra-W+Glyphosate	2+0.4+0.37	86	90	88	63	78	89	75
Cyan-W+Atrazine-W+Paraquat	2+0.4+0.5	89	94	91	65	75	90	77
Cyan-W+Atrazine-W+LOTM	2+0.4+0.25G	93	92	92	73	79	93	83
Control	0	0	0	0	0	0	0	0
Mean		81	83	82	63	72	82	72
High mean		98	98	98	86	91	95	91
Low mean		0	0	0	0	0	0	0
Coeff. of variation		3	4	3	15	9	2	6
LSD(1 Percent)		5	6	5	18	13	3	8
LSD(5 Percent)		4	5	3	13	9	3	6
No. of reps		4	4	4	4	4	4	4

Summary

Weed control was better with the higher than lower rate of cyanazine plus atrazine regardless of cyanazine formulation.

Cyanazine for chemical fallow, Williston 1981. Treatments were applied May 7 to 1 to 3 inch tansy mustard and Russian thistle using a bicycle sprayer delivering 17 gpa at 35 psi. Rainfall for a 2 week period following application totaled 0.4 inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate.

		Percent control									
	Rate	June22				July 9				Total
Treatment	lb/A	Fxtl	Tamu	Ruth	Kocz	Fxtl	Tamu	Ruth	Kocz	Veg
Cyan-DF+Atrazine-W+2,4-D	2+0.4+0.5	94	100	100	100	96	100	100	100	99
Cyan-DF+Atrazine-W+2,4-D	3+0.6+0.5	76	100	100	100	100	100	100	100	100
Cyan-W+Atrazine-W+2,4-D	2+0.4+0.5	94	100	100	100	98	100	99	100	98
Cyan-W+Atrazine-W+2,4-D	3+0.6+0.5	100	100	100	100	100	100	100	100	100
Cyan-W+Atrazine-W+Glyphosate	2+0.4+0.37	93	100	100	100	97	100	100	100	99
Cyan-LF+Atra-W+Glyphosate	2+0.4+0.37	90	100	100	100	91	100	100	99	96
Cyan-W+Atrazine-W+Paraquat	2+0.4+0.5	96	100	100	100	99	100	100	100	99
Cyan-W+Atrazine-W+LOTM	2+0.4+0.25G	93	98	100	98	99	97	100	100	98
Control	0	0	0	0	0	0	0	0	0	0
Mean		82	89	89	89	86	88	89	89	87
High mean		100	100	100	100	100	100	100	100	100
Low mean		0	0	0	0	0	0	0	0	0
Coeff. of variation		19	2	0	2	2	1	1	1	1
LSD(1 Percent)		31	3	0	3	3	3	2	2	2
LSD(5 Percent)		23	2	0	2	2	2	1	1	2
No. of reps		4	4	4	4	4	4	4	4	4

Summary

Weed control was excellent with all treatments.

PP009 in fallow systems, Fargo 1981. Treatments were applied July 1 to 2 to 6 inch weeds with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. The experimental design was a randomized complete block with 3 replications and experimemtal units were 8 by 20 ft. Weed densities were moderate to heavy.

		Percent control					
	Rate	July 21			August 10		
Treatment	oz/A	Kocz	Fxtl	VSF	Kocz	Fxtl	VSF
PP009+OC	2+1qt	0	99	0	0	82	0
PP009+OC	4+1qt	0	98	0	0	94	0
PP009+OC	8+1qt	0	98	0	0	88	0
PP009+Chlorsulfuron+OC	4+0.5+1qt	99	99	99	95	90	96
Control		0	0	0	0	0	0
Mean		20	79	20	19	71	19
High mean		99	99	99	95	94	96
Low mean		0	0	0	0	0	0
Coeff. of variation		0	1	0	11	11	12
LSD(1 Percent)		0	2	0	6	21	6
LSD(5 Percent)		0	1	0	4	14	4
No. of reps		3	3	3	3	3	3

Summary

Foxtail control was good with PP009 at rates of 2 to 8 oz/A. PP009 combinations with chlorsulfuron provided good control of all weed species.

Non-selective fallow herbicides, Fargo 1981. Treatments were applied June 3 to 2 to 4 inch kochia and sunflower (VSF) using a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. Precipitation for a 2 week period following application totaled 1.3inch. The experimental design was a randomized complete block with 4 replications and experimental units were 8 by 20 feet. Weed densities were moderate.

Treatment	Rate oz/A	----Percent control---- Kocz	VSF
Glyphosate	3	98	95
Glyphosate	6	99	98
Glyphosate	12	100	100
Glyphosate+S	1.5+0.5%	75	68
Glyphosate+S	3+0.5%	90	88
Glyphosate+S	6+0.5%	98	95
Glyphosate+2,4-D	3+8	96	91
Glyphosate+2,4-D+S	3+8+0.5%	95	94
Glyphosate+Dicamba+S	1.5+2+0.5%	85	93
Glyphosate+Dicamba	3+2	90	96
Glyphosate+Dicamba+S	3+2+0.5%	95	98
Glyphosate+Bromoxynil	3+4	100	100
Glyphosate+Bromoxynil+S	3+4+0.5%	99	100
Glyphosate+NH3NO3	3+1G	89	94
Glyphosate+NH3NO3+S	3+1G+0.5%	100	96
Glyphosate+NH3NO3	3+8G	71	80
Glyphosate+NH3NO3+S	3+8G+0.5%	97	93
Paraquat+S	4+0.5%	100	100
Paraquat+S	8+0.5%	100	100
Paraquat+2,4-D+S	4+8+0.5%	97	95
Paraquat+Dicamba+S	4+2+0.5%	100	95
Paraquat+Bromoxynil+S	4+4+0.5%	99	96
Paraquat+NH3NO3+S	4+1G+0.5%	98	95
Paraquat+NH3NO3+S	4+8G+0.5%	100	100
HOE-00661	8	100	99
HOE-00661	12	100	100
HOE-00661	16	100	100
HOE-00661+NH3SO4	8+1G	100	95
HOE-00661+NH3SO4	12+1G	100	100
HOE-00661+NH3NO3	8+1G	99	98
Control		0	0
Mean		92	92
High mean		100	100
Low mean		0	0
Coeff. of variation		5	6
LSD(1 Percent)		9	10
LSD(5 Percent)		7	7
No. of reps		4	4

Summary

Weed control was excellent with glyphosate at 3, 6 or 12 oz/A; paraquat at 4 or 8 oz/A and HOE-00661 at 8, 12, or 16 oz/A. Weed control with 3 oz/A glyphosate was reduced by the addition of 8 gpa nitrogen when no surfactant was added.

Non-selective herbicides for fallow, Minot 1981. Treatments were applied June 22 to 1 to 4 inch Russian thistle, kochia, or greenflowering pepperweed and 6leaf wild oat 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 8 by 20 ft. Weed densities were moderate.

Treatment	Rate oz/A	----------Percent Wioa	control---------- Gfpw	Ruth	Kocz
Glyphosate	3	55	0	34	28
Glyphosate	6	93	10	86	45
Glyphosate	12	100	75	96	90
Glyphosate+S	1.5+0.5%	55	0	18	20
Glyphosate+S	3+0.5%	90	0	66	65
Glyphosate+S	6+0.5%	98	60	98	100
Glyphosate+2,4-D	3+8	30	0	62	78
Glyphosate+2,4-D+S	3+8+0.5%	60	10	76	94
Glyphosate+Dicamba+S	1.5+2+0.5%	38	33	50	65
Glyphosate+Dicamba	3+2	58	58	72	65
Glyphosate+Dicamba+S	3+2+0.5%	75	18	79	93
Glyphosate+Bromoxynil	3+4	63	40	88	92
Glyphosate+Bromoxynil+S	3+4+0.5%	63	50	85	70
Glyphosate+NH3NO3	3+1G	45	0	39	25
Glyphosate+NH3NO3+S	3+1G+0.5%	88	0	76	75
Glyphosate+NH3NO3	3+8G	25	10	23	0
Glyphosate+NH3NO3+S	3+8G+0.5%	25	0	44	30
Paraquat+S	4+0.5%	45	40	94	83
Paraquat+S	8+0.5%	75	78	96	95
Paraquat+2,4-D+S	4+8+0.5%	48	65	96	90
Paraquat+Dicamba+S	4+2+0.5%	50	70	93	93
Paraquat+Bromoxynil+S	4+4+0.5%	43	28	96	93
Paraquat+NH3NO3+S	4+1G+0.5%	45	25	93	90
Paraquat+NH3NO3+S	4+8G+0.5%	40	15	90	35
HOE-00661	8	80	98	83	80
HOE-00661	12	95	95	95	95
HOE-00661	16	98	100	93	95
HOE-00661+NH3SO4	8+1%	84	93	73	68
HOE-00661+NH3SO4	12+1%	93	98	95	88
HOE-00661+NH3NO3	8+1%	90	93	81	89
Control		0	0	0	0
Mean		63	41	73	68
High mean		100	100	98	100
Low mean		0	0	0	0
Coeff. of variation		21	33	19	18
LSD(1 Percent)		36	37	25	34
LSD(5 Percent)		27	27	19	25
No. of reps		2	2	4	2

Summary

The addition of 2,4-D, dicamba, or bromoxynil increased broadleaf weed control and the addition of surfactant increased wild oat control with 3 oz /A glyphosate. Weed control with 4 oz/A paraquat was influenced only slightly by the addition of 2,4-D, dicamba, or bromoxynil but reduced by the addition of 8 gpa nitrogen. HOE-00661 at 12 or 16 oz/A provided good broad-spectrum weed control.

False chamomile control with non-selective herbicides, Mohall 1981. Treatments were applied to 4 to 6 inch false chamomile on May 27 with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. Rainfall for a 2 week period following application totalled 1.2 inch. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. False chamomile densities were heavy.

Treatments	Rate lb/A	% Control July 22 Fach
Glyphosate+S	0.37+.5%	84
Glyphosate+S	0.75+.5%	90
Glyphosate+Dicamba+S	0.37+0.12+.5%	77
Glyphosate+2,4-D+S	0.27+0.5+.5%	85
Glyphosate+Bromoxynil+S	0.37+0.25+.5%	51
Paraquat+S	0.37+.5%	69
Paraquat+S	0.75+.5%	58
Paraquat+Dicamba+S	0.37+0.12+.5%	55
Paraquat+2,4-D+S	0.37+0.5+.5%	60
Amitrol	1	94
Amitrol+2,4-D	1+0.5	97
Amitrol	1.5	98
Amitrol	2	99
HOE-00661	0.5	82
HOE-00661	1	90
Control		0
Mean		74
High mean		99
Low mean		0
Coeff. of variation		12
LSD(1 Percent)		16
LSD(5 Percent)		12
No. of reps		4

Summary

False chamomile control was 80% or greater with amitrol at 1 to 2 lb/A, HOE-00661 at 0.5 to 1.0 lb/A and glyphosate at 0.37 to 0.75 lb/A. False chamomile control with paraquat was not adequate at 0.37 to 0.75 lb/A. The addition of bromoxynil reduced false chamomile control with glyphosate over 30%.

False chamomile control with non-selective herbicides, Renville Co. 1981. Treatments were applied to 3 to 4 inch weeds on May 21 with a bicycle wheel plot sprayer delivering 8.5 gpa at 35 psi. Rainfall for a 2 week period following application totalled 0.75 inch. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate.

Treatment	lb/A Rate	Fach	Tamu
		-Percent control July 8-	
Glyphosate+S	.37+.5%	93	96
Glyphosate+S	.75+.5%	94	94
Glyphosate+Dicamba+S	.37+.12+.5%	81	74
Glyphosate+2,4-D+S	.37+.5+.5%	81	86
Glyphosate+Brox+S	.37+.25+.5%	63	65
Paraquat+S	.37+.5%	73	79
Paraquat+S	.75+.5%	80	66
Paraquat+Dicamba+S	.37+.12+.5%	81	61
Paraquat+2,4-D+S	.37+.5+.5%	75	61
Amitrol	1.0	92	98
Amitrol+2,4-D	1.0+.5	91	93
Amitrol	1.5	91	98
Amitrol	2.0	97	99
HOE 00661	.5	100	92
HOE 00661	1.0	96	89
Control		0	0
Mean		80	78
High mean		100	99
Low mean		0	0
Coeff. of variation		13	19
LSD(1 Percent)		20	27
LSD(5 Percent)		15	21
No. of reps		4	4

Summary

False chamomile or tansy mustard control was 90% or greater with HOE-00661 at 0.5 or 1 lb/A, amitrol at 1 to 2 lb/A, and glyphosate at 0.37 to 0.75 lb/A. False chamomile or tansy mustard control was not adequate with paraquat at 0.37 or 0.75 lb/A. The addition of dicamba, 2,4-D or bromoxynil reduced weed control with glyphosate.

Evaluation of postemergence herbicides for false chamomile control, Mohall 1981. Treatments were applied May 11 to 3 to 4 inch false chamomile with a bicycle wheel sprayer delivering 8.5 gpa at 35 psi. Rainfall for a 2 week period following application totalled 0.7 inch. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. Weed densities were moderate.

Treatment	Rate oz/A	-Percent control July 22- Fach	Tamu
Bromoxynil+MCPA	6+6	8	21
Bromoxynil+Diuron	4+8	9	64
Chlorsulfuron+LOTM	0.25+0.25G	92	97
Chlorsulfuron	0.25	91	90
Chlorsulfuron+WK	0.25+.1%	95	97
Chlorsulfuron+WK	0.5+.1%	97	99
Chlorsulfuron+WK	1+.1%	98	100
R-40244	4	8	84
MC-10108	4	0	44
MC-10108	8	9	85
RH-043-E	4	19	83
Control		0	0
Mean		44	72
High mean		98	100
Low mean		0	0
Coeff. of variation		17	27
LSD(1 Percent)		14	37
LSD(5 Percent)		11	28
No. of reps		4	4

Summary

False chamomile and tansy mustard control was good with chlorsulfuron at rates of 0.25 to 1 oz/A alone or in combination with additives. No other treatments controlled false chamomile.

Fall application of herbicides for false chamomile control in wheat, Mohall 1980-81. Treatments were applied November 6 to false chamomile in the rosette stage using a bicycle wheel sprayer delivering 17 gpa at 35 psi. Trifluralin treatments were rototiller incorporated immediately after application. False chamomile control was evaluated March 19 and May 8 prior to spring seedbed preparation. Rugby durum was seeded May 11. Foxtail and injury ratings were on July22. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft.

Treatment	Rate lb/A	Wheat %ir	-------Percent control------- Grft	Fach 3/19	Fach 5/8
Trifluralin	.75	3	69	90	94
Chlorsulfuron	.015	4	89	48	11
Chlorsulfuron	.03	0	99	54	31
Chlorsulfuron	.06	16	99	50	21
Chlorsulfuron	.12	18	99	59	26
Bromoxynil+MCPA	.25+.25	0	0	58	35
Paraquat+X-77	.37+.5%	0	0	69	25
Paraquat+X-77	.5+.5%	0	0	75	24
Glyphosate+X-77	.37+.5%	0	0	56	18
Glyphosate+X-77	.5+.5%	0	0	60	14
Amitrol	1.0	0	35	49	51
Control		0	0	0	0
Mean		3	41	56	29
High mean		18	99	90	94
Low mean		0	0	0	0
Coeff. of variation		315	28	14	65
LSD(1 Percent)		20	22	15	36
LSD(5 Percent)		15	16	11	27
No. of reps		4	4	4	4

Summary

Fall application of chlorsulfuron at 1 and 2 oz/A injured wheat 16 and 17%; respectively. Foxtail control was excellent with all rates of chlorsulfuron. The only treatment which adequately controlled false chamomile was trifluralin which was incorporated.

False chamomile competition in wheat, Mohall 1981. Len wheat was seeded May 11 in 6 inch row spacing. False chamomile densities were established shortly after wheat emergence. The experiment was a randomized complete block with 3 replications and experimental units were 15 by 12 ft.

Winter Annual Plants/yd sq	Yield bu/A
0.0	22.5
0.5	21.5
1.0	16.5
1.5	10.4
Mean	17.7
High mean	22.5
Low mean	10.4
Coeff. of variation	16.5
LSD(1 Percent)	8.8
LSD(5 Percent)	5.8
No. of reps	3.0

Summary

Season long competition from winter annual false chamomile at densities of 1 and 1.5 plants/yd sq reduced wheat yield 27 and 54%; respectively. The area for the competition trial was rototilled at a very fast ground speed so the false chamomile plants were not uprooted and were vigoroulsy growing when the wheat emerged.

Glyphosate and liquid nitrogen combinations for quackgrass control, Devils Lake 1981. Glyphosate plus liquid nitrogen combinations were applied to established quackgrass sod to simulate an early season perennial weed problem in notill cropping. The treatments were applied at 32 psi in 17 gpa when the quackgrass was 6 to 10 inches tall and vigorously growing on May 18. The experiment was a randomized complete block design with 4 replications. The liquid nitrogen was 28-0-0 and a non-ionic surfactant was used. May, June and July rainfall was above normal.

Treatment	Rate oz/A	---Percent June 11	quackgrass July 30	control--- Sept 15
Glyphosate	24	99	92	95
Glyphosate	18	90	85	91
Glyphosate	12	74	72	55
Glyphosate	6	43	24	0
Glyphosate+S	18+.5%	98	92	83
Glyphosate+S	12+.5%	95	93	48
Glyphosate+S	6+.5%	80	65	20
Glyphosate+Nitrogen	18+1G	93	86	68
Glyphosate+Nitrogen	12+1G	87	75	58
Glyphosate+Nitrogen	6+1G	64	55	43
Glyphosate+Nitrogen+S	18+1G+.5%	100	98	88
Glyphosate+Nitrogen+S	12+1G+.5%	89	86	78
Glyphosate+Nitrogen+S	6+1G+.5%	43	38	20
Glyphosate+Nitrogen	18+3G	86	83	80
Glyphosate+Nitrogen	12+3G	84	79	43
Glyphosate+Nitrogen	6+3G	58	39	13
Glyphosate+Nitrogen+S	18+3G+.5%	100	94	95
Glyphosate+Nitrogen+S	12+3G+.5%	99	92	93
Glyphosate+Nitrogen+S	6+3G+.5%	93	93	58
Control		6	3	0
Mean		79	72	56
High mean		100	98	95
Low mean		6	3	0
Coeff. of variation		18	25	50
LSD(1 Percent)		27	33	81
LSD(5 Percent)		20	25	59
No. of reps		4	4	2

Summary

Quackgrass control with glyphosate at 18 oz/A was not improved by adding surfactant or nitrogen. The September evaluation indicated that quackgrass control with glyphosate at 12 oz/A tended to improve with the addition of nitrogen plus surfactant compared to surfactant alone. Quackgrass control with glyphosate at 12 oz/A tended to be greater with nitrogen at 3 gal/A plus surfactant. Quackgrass control with glyphosate at 6 oz/A increased with nitrogen at 3 gal/A plus surfactant, but total control was not satisfactory.

Wheat on fall applied fallow herbicides, Fargo 1979-81. Fallow herbicides were applied on wheat stubble October 29, 1979. Precipitation totalled 19.4 inch during the 18 month period between herbicide application and wheat seeding. Era wheat was seeded April 24, 1981 into untilled soil. Wheat injury and stand reduction were evaluated July 6. 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	%ir	%sr	1980 % Cont
Hexazinone	.75	38.2	0	0	64
Chlorsulfuron	.06	48.3	0	0	93
Chlorsulfuron	.12	50.0	0	0	98
EL-187	.5	42.5	0	0	75
EL-187	.75	38.5	4	10	95
Atrazine	1	41.1	0	3	73
Metribuzin	1	38.7	0	0	92
Cyanazine	3	43.7	0	0	81
Hexazinone+Diuron	.75+1	41.1	0	3	86
Hexazinone+Chlorsulfuron	.75+.06	47.6	1	0	98
Hexazinone+Chlorsulfuron+IPC	.75+.06+3	43.5	0	1	95
Hexazinone+Atrazine	.75+.75	36.5	0	1	92
Hexazinone+Metribuzin	.5+.5	36.1	0	0	97
Hexazinone+Metribuzin	.75+.5	39.4	0	0	97
Hexazinone+Metribuzin	.5+.75	36.6	0	0	99
Hexazinone+Metribuzin	.75+.75	32.9	0	0	98
Hexazinone+Metribuzin+IPC	.75+.75+3	41.8	1	0	99
EL-187+Atrazine	.5+.5	38.7	1	4	93
EL-187+Atrazine	.75+.5	40.6	3	9	97
EL-187+Atrazine	.5+.75	30.3	8	25	96
EL-187+Atrazine	.75+.75	31.6	4	14	97
EL-187+Metribuzin	.5+.75	36.4	0	5	99
EL-187+Cyanazine	.5+2	36.7	1	5	89
EL-187+Terbutryn	.5+2	40.7	0	0	88
EL-187+Chlorsulfuron	.5+.06	45.4	1	4	99
Buthidazole+Atrazine	.75+.75	43.6	0	0	86
Buthidazole+Metribuzin	.75+.75	37.5	1	0	93
Cyanazine+Atrazine	2+.5	41.0	0	0	77
Cyanazine+Atrazine	2+.75	35.2	0	0	89
Cyanazine+Atrazine+IPC	2+.75+3	36.8	0	1	91
Cyanazine+Metribuzin	2+.75	32.2	0	0	98
Cyanazine+Chlorsulfuron	2+.06	48.9	0	0	97
Atrazine+Terbutryn	.75+2	38.8	0	3	79
Metribuzin+Chlorsulfuron	.75+.06	44.7	1	0	99
Control		24.0	0	0	0
Mean		39.4	1	2	88
High mean		50.0	8	25	99
Low mean		24.0	0	0	0
Coeff. of variation		17.4	260	185	6
LSD(1 Percent)		12.7	4	8	10
LSD(5 Percent)		9.6	3	6	8
No. of reps		4.0	4	4	4

Summary

EL-187 alone or incombination with atrazine reduced stand of wheat when seeded 18 months after application. Highest wheat yields were obtained on plots treated with chlorsulfuron at 0.06 and 0.12 lb/A.

Wheat on fall applied fallow herbicides, Mohall 1979-81. Fallow herbicides were applied on wheat stubble October 23, 1979. Precipitation totalled 20.1 inch during the 18 month period between herbicide application and wheat seeding. False chamomile control was evaluated May 8 prior to tillage and seeding of Coteau wheat. Wheat injury and in crop false chamomile control were evaluated July 22. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. False chamomile density in control plots was moderate.

		---------Wheat-------			-% Control-	
					----Fach----	
1979 Fallow treatments	Rate lb/A	Yield bu/A	Twt lb/A	%ir	May8	July22
Hexazinone	0.5	26.7	57.0	3	55	74
Chlorsulfuron	0.06	27.3	56.5	0	100	100
Cyanazine	2.0	13.8	57.5	0	0	21
Hexazinone+Atrazine	0.5+0.5	35.7	57.0	1	86	99
Hexazinone+Metribuzin	0.5+0.5	25.5	56.9	3	84	86
Hexazinone+Chlorsulfuron	0.5+0.06	35.0	57.5	3	100	100
Cyanazine+Atrazine	2+0.5	13.6	57.8	0	19	38
Cyanazine+Metribuzin	2+0.5	15.3	57.5	0	3	20
Cyanazine+Chlorsulfuron	2+0.06	32.5	57.3	0	100	100
Control		11.6	57.1	0	25	0
Mean		23.7	57.2	1	57	64
High mean		35.7	57.8	3	100	100
Low mean		11.6	56.5	0	0	0
Coeff. of variation		31.2	0.	227	40	27
LSD(1 Percent)		14.5	0.	4	45	33
LSD(5 Percent)		10.7	0.	3	33	25
No. of reps		4.0	1.0	4	4	4

Summary

Residual false chamomile control was excellent with chlorsulfuron alone or in combination with hexazinone and cyanazine and good with hexazinone in combination with atrazine or metribuzin. Treatments containing chlorsulfuron or hexazinone increased wheat yield 14 to 24 bu/A compared to the control.

Wheat on spring preemergence fallow herbicides, Fargo 1980-81. Fallow herbicides were applied on wheat stubble April 15, 1980. Precipitation totalled 14.6inch during the 12 month period between herbicide application and wheat seeding. Era wheat was seeded April 24, 1981 into untilled soil. Wheat injury and stand reduction were evaluated July 6. 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	%ir	%sr	1980 % Cont
Hexazinone	.5	30.3	0	1	37
Chlorsulfuron	.03	42.2	0	0	55
Chlorsulfuron	.06	45.5	0	0	67
Chlorsulfuron (DF)	.06	44.2	1	0	63
Chlorsulfuron	.12	43.6	0	0	65
EL-187	.5	37.7	0	3	67
EL-187	.75	42.5	0	3	62
Atrazine	.75	31.5	0	0	67
Metribuzin (4L)	.75	41.5	0	0	64
Metribuzin (4L)	1	35.3	0	0	79
Metribuzin (WP)	.75	40.4	0	0	62
Metribuzin (WP)	1	43.1	0	0	70
Cyanazine	2.5	40.8	0	0	61
Hexazinone+Diuron	.5+1	35.8	0	0	68
Hexazinone+Chlorsulfuron	.5+.03	49.7	0	3	67
Hexazinone+Chlorsulfuron	.5+.06	48.5	0	1	69
Hexazinone+Atrazine	.5+.5	42.0	0	3	79
Hexazinone+Metribuzin	.5+.5	42.1	0	1	82
Hexazinone+Terbutryn	.5+2	32.7	0	0	68
EL-187+Atrazine	.5+.5	43.7	1	8	79
EL-187+Atrazine	.75+.5	42.7	0	6	79
EL-187+Metribuzin	.5+.5	38.0	0	1	75
EL-187+Metribuzin	.75+.5	36.2	0	3	79
EL-187+Cyanazine	.5+2	36.3	0	0	66
EL-187+Chlorsulfuron	.5+.06	47.6	0	3	65
Buthidazole+Atrazine	.5+.5	40.3	0	1	60
Buthidazole+Metribuzin	.5+.5	40.9	0	0	71
Buthidazole+Chlorsulfuron	.5+.06	45.1	1	0	76
Cyanazine+Atrazine	2+.5	37.3	0	0	75
Cyanazine+Metribuzin	2+.5	38.2	0	0	72
Cyanazine+Chlorsulfuron	2+.06	46.3	5	0	65
Cyanazine+Atrazine+Clsu	2+.5+.06	46.0	0	0	69
Terbutryn+Atrazine	2+.5	42.2	0	0	72
Terbutryn+Metribuzin	2+.5	39.9	0	0	71
Terbutryn+Metolachlor+Atrazine	2+2+.5	41.7	0	0	77
Control		30.4	0	0	0
Mean		40.6	0	1	67
High mean		49.7	5	8	82
Low mean		30.3	0	0	0
Coeff. of variation		16.6	405	218	14
LSD(1 Percent)		12.5	2	4	17
LSD(5 Percent)		9.4	1	3	13
No. of reps		4.0	4	4	4

Summary

No treatment reduced wheat stand over 10% with a 12 month interval between application and seeding. Highest wheat yields were obtained on plots treated with chlorsulfuron combinations with hexazinone, buthidazole, cyanazine, or EL-187.

Wheat on spring preemergence fallow herbicides, Minot 1980-81. Fallow herbicides were applied on wheat stubble April 16, 1980. Precipitation totalled 15.9inch during the 12 month period between herbicide application and wheat seeding. The entire experimental area was tilled and Coteau wheat seeded April 24, 1981. Wheat injury and stand reduction were evaluated June 22. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft.

Treatment	Rate lb/A	-------Wheat----- %ir	%sr	1980 % Cont
Hexazinone	.5	0	1	87
Chlorsulfuron	.03	0	3	68
Chlorsulfuron	.06	0	4	83
Chlorsulfuron (DF)	.06	0	4	72
Chlorsulfuron	.12	0	5	86
EL-187	.5	0	0	97
EL-187	.75	0	4	98
Atrazine	.75	0	1	99
Metribuzin (4L)	.75	0	0	92
Metribuzin (4L)	1	0	3	98
Metribuzin (WP)	.75	0	1	95
Metribuzin (WP)	1	0	8	99
Cyanazine	2.5	0	0	90
Hexazinone+Diuron	.5+1	0	3	92
Hexazinone+Chlorsulfuron	.5+.03	0	6	93
Hexazinone+Chlorsulfuron	.5+.06	0	3	95
Hexazinone+Atrazine	.5+.5	0	3	89
Hexazinone+Metribuzin	.5+.5	3	4	98
Hexazinone+Terbutryn	.5+2	3	9	99
EL-187+Atrazine	.5+.5	0	4	96
EL-187+Atrazine	.75+.5	0	6	95
EL-187+Metribuzin	.5+.5	3	4	98
EL-187+Metribuzin	.75+.5	0	4	99
EL-187+Cyanazine	.5+2	0	6	95
EL-187+Chlorsulfuron	.5+.06	0	4	98
Buthidazole+Atrazine	.5+.5	0	8	97
Buthidazole+Metribuzin	.5+.5	0	4	93
Buthidazole+Chlorsulfuron	.5+.06	0	0	97
Cyanazine+Atrazine	2+.5	0	8	93
Cyanazine+Metribuzin	2+.5	3	5	97
Cyanazine+Chlorsulfuron	2+.06	0	5	96
Cyanazine+Atrazine+Clsu	2+.5+.06	0	1	97
Terbutryn+Atrazine	2+.5	0	3	100
Terbutryn+Metribuzin	2+.5	0	4	100
Terbutryn+Metribuzin+Atrazine	2+2+.5	0	0	100
Control		0	0	0
Mean		0	3	91
High mean		3	9	100
Low mean		0	0	0
Coeff. of variation		574	137	7
LSD(1 Percent)		3	9	12
LSD(5 Percent)		2	7	9
No. of reps		4	4	4

Summary

No chemical fallow treatment reduced wheat stand over 10% with a 12 month interval between application and seeding.

Wheat on preemergence fallow herbicides, Williston 1980-81. Fallow herbicides were applied on wheat stubble April 17, 1980. Precipitation totalled 12.3inch during the 12 month period between herbicide application and wheat seeding. Waldron wheat was seeded April 15. Wheat injury and stand reduction were evaluated July 9. 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	Wheat Twt lb/bu	%ir	%sr	% Control 1980	% Control Ruth
Hexazinone	0.5	28.2	57.8	0	3	67	0
Chlorsulfuron	0.03	29.7	57.8	0	0	87	75
Chlorsulfuron	0.06	30.7	58.1	0	0	74	83
Chlorsulfuron	0.06	31.1	57.8	0	0	83	89
Chlorsulfuron	.12	32.9	57.8	0	0	87	99
EL-187	0.5	26.5	58.2	0	33	58	0
EL-187	.75	15.9	58.3	0	60	60	28
Atrazine	.75	28.2	58.3	0	3	41	30
Metribuzin (4L)	0.75	30.0	58.6	0	0	70	0
Metribuzin (4L)	1	30.9	58.2	0	1	75	13
Metribuzin (WP)	0.75	24.5	58.3	0	3	56	33
Metribuzin (WP)	1	24.4	58.8	0	3	64	31
Cyanazine	2.5	30.8	57.9	0	0	53	13
Hexazinone+Diuron	.5+1	27.7	58.8	0	20	82	0
Hexazinone+Chlorsulfuron	.5+0.03	27.6	57.9	0	11	85	89
Hexazinone+Chlorsulfuron	.5+0.06	31.0	58.2	0	14	89	81
Hexazinone+Atrazine	.5+.5	22.2	58.6	0	33	85	0
Hexazinone+Metribuzin	.5+.5	26.3	57.9	0	21	84	35
Hexazinone+Terbutryn	.5+2	23.3	58.4	0	18	93	18
EL-187+Atrazine	.5+.5	25.0	58.6	0	30	50	0
EL-187+Atrazine	.75+.5	11.7	58.7	0	73	68	20
EL-187+Metribuzin	.5+.5	22.1	58.3	0	24	54	8
EL-187+Metribuzin	.75+.5	15.1	58.8	0	60	62	40
EL-187+Cyanazine	.5+2	25.5	58.4	0	33	68	24
EL-187+Chlorsulfuron	.5+0.06	26.0	58.1	0	33	89	71
Buthidazole+Atrazine	.5+.5	27.4	58.5	0	25	79	23
Buthidazole+Metribuzin	.5+.5	30.5	57.7	0	0	71	16
Buthidazole+Chlorsulfuron	.5+0.06	30.1	57.6	0	1	86	83
Cyanazine+Atrazine	2+.5	28.9	58.3	0	0	53	23
Cyanazine+Metribuzin	2+.5	31.0	57.8	0	1	69	25
Cyanazine+Chlorsulfuron	2+0.06	32.2	57.2	0	0	89	69
Cyanazine+Atrazine+Clsu	2+.5+0.06	33.7	58.0	0	0	80	93
Terbutryn+Atrazine	2+.5	29.4	58.5	0	0	59	42
Terbutryn+Metribuzin	2+.5	26.2	58.7	0	0	62	0
Terbutryn+Metolachlor+Atrazine	2+2+.5	28.2	58.3	0	1	71	0
Control		26.2	58.1	0	0	0	0
Mean		27.0	58.2	0	14	69	35
High mean		33.7	58.8	0	73	93	99
Low mean		11.7	57.2	0	0	0	0
Coeff. of variation		15.5	0.	0	87	15	81
LSD(1 Percent)		7.8	0.	0	22	20	52
LSD(5 Percent)		5.9	0.	0	17	15	39
No. of reps		4.0	1.0	4	4	4	4

Summary

Wheat stands were reduced 24 to 60% by EL-187 alone or in combination with atrazine, metribuzin, cyanazine or chlorsulfuron and 11 to 33% by hexazinone combinations with diuron, chlorsulfuron, atrazine, metribuzin or terbutryn. EL-187 at 0.75 lb/A alone or in combination with other herbicides reduced wheat yields.

Wheat on postemergence fallow herbicides, Minot 1980-81. Fallow herbicides were applied on wheat stubble May 20, 1980. Precipitation totalled 15.1inch during the 11 month period between herbicide application and wheat seeding. The entire experimental area was tilled and Coteau wheat seeded April 24, 1981. Wheat injury and stand reduction were evaluated June 22. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft.

Treatment	Rate lb/A	-----Wheat----- %ir	%sr	1980 % Cont
Terbutryn+S	2+.5%	0	0	46
Terbutryn+Atrazine+S	2+.5+.5%	3	4	64
Terbutryn+Metribuzin+S	2+.5+.5%	0	3	80
Terbutryn+2,4-D+S	2+.5+.5%	0	1	85
Terbutryn+Chlorsulfuron+S	2+.06+.5%	3	6	100
Terbutryn+Metribuzin+2,4-D+S	2+.5+.5+.5%	8	5	98
Metribuzin (L)+Paraquat+S	.5+.5+.5%	3	6	100
Metribuzin (L)+Paraquat+S	.75+.5+.5%	C	3	99
Metribuzin+Paraquat+S	.5+.5+.5%	8	8	95
Metribuzin+Paraquat+S	.75+.5+.5%	3	8	100
Metribuzin+Clsu+Paraquat+S	.5+.06+.5+.5%	3	4	100
Atrazine+Paraquat+S	.5+.5+.5%	3	9	98
Atrazine+Paraquat+S	.75+.5+.5%	0	3	79
Atrazine+CLSU+Paraquat	.5+.06+.5+.5%	3	3	99
Cyanazine+Paraquat+S	2+.5+.5%	0	4	99
Cyanazine+Atrazine+Para+S	2+.5+.5+.5%	3	3	98
EL-187+Atrazine+Paraquat+S	.5+.5+.5+.5%	0	0	98
Chlorsulfuron+Paraquat+S	.03+.5+.5%	0	1	98
Chlorsulfuron+Paraquat+S	.06+.5+.5%	5	8	100
Control		0	0	0
Mean		2	4	87
High mean		8	9	100
Low mean		0	0	0
Coeff. of variation		219	149	14
LSD(1 Percent)		8	11	22
LSD(5 Percent)		6	8	17
No. of reps		4	4	4

Summary

No chemical fallow treatment reduced wheat stand over 10% with an 11 month interval between application and seeding.

Wheat planted on postemergence fallow herbicides, Williston 1980-81. Fallow herbicides were applied on wheat stubble May 19, 1980. Precipitation totalled 12.0 inch during the 11 month period between application and wheat seeding. Waldron wheat was seeded April 15. Wheat injury and stand reduction were evaluated July 9. 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	Wheat Twt lb/bu	Wheat %ir	Wheat %sr	% Cont 1980
Terbutryn+S	2	29.4	57.8	0	1	5
Terbutryn+Atrazine+S	2+.5	32.5	56.9	0	3	36
Terbutryn+Metribuzin+S	2+.5	29.5	57.7	0	0	51
Terbutryn+2,4-D+S	2+.5	32.0	57.4	0	0	58
Terbutryn+Chlorsulfuron+S	2+.06	34.1	55.9	0	0	94
Terbutryn+Metribuzin+2,4-D+S	2+.5+.5	33.4	57.5	0	0	80
Metribuzin(L)+Paraquat+S	.5+.5	30.2	57.4	0	0	73
Metribuzin(L)+Paraquat+S	.75+.5	32.5	57.9	0	0	70
Metribuzin+Paraquat+S	.5+.5	30.4	57.7	0	0	67
Metribuzine+Paraquat+S	.75+.5	32.0	57.4	0	4	75
Metribuzin+Chlorsulfuron+Par+S	.5+.06+.5	34.3	56.6	0	3	93
Atrazine+Paraquat+S	.5+.5	32.3	57.4	0	0	57
Atrazine+Paraquat+S	.75+.5	32.0	57.2	0	3	65
Atrazine+Chlorsulfuron+Para+S	.5+.06+.5	34.1	57.2	0	0	83
Cyanazine+Paraquat+S	2+.5	30.7	57.5	0	0	72
Cyanazine+Atrazine+Paraquat+S	2+.5+.5	32.0	57.6	0	4	75
EL-187+Atrazine+Paraquat+S	.5+.5+.5	27.2	57.2	0	21	66
Chlorsulfuron+Paraquat+S	.03+.5	29.5	57.1	0	0	75
Chlorsulfuron+Paraquat+S	.06+.5	31.9	57.1	0	1	80
Control		28.0	57.7	0	0	0
Mean		31.4	57.3	0	2	64
High mean		34.3	57.9	0	21	94
Low mean		27.2	55.9	0	0	0
Coeff. of variation		8.5	0.	0	183	11
LSD(1 Percent)		5.0	0.	0	7	13
LSD(5 Percent)		3.8	0.	0	5	10
No. of reps		4.0	1.0	4	4	4

Summary

No treatment reduced wheat yields compared to the control. EL-187 at 0.5 lb/A in combination with atrazine reduced wheat stand 21%.

Wheat on spring applied fallow herbicides, Mohall 1980-81. Fallow herbicides were applied on wheat stubble May 21, 1980. Precipitation totalled 16.4 inch during the 12 month period between herbicide application and wheat seeding. False chamomile control was evaluated May 8 prior to tillage and seeding of Coteau wheat. Wheat injury and in crop weed control were evaluated July 22. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft. False chamomile density in control plots was light.

		-------Wheat-------			Percent	Control	
	Rate	Yield	Twt		May8	--June22--	
Treatment	lb/A	bu/A	lb/bu	%ir	Fach	Fach	Grft
Cyanazine	2.5	23.1	56.8	0	61	0	0
Metribuzin	.75	20.9	56.0	0	20	0	0
Atrazine	2	17.2	56.0	0	81	0	0
Cyanazine+Atrazine	2+.5	27.7	56.4	0	75	25	26
Cyanazine+Metribuzin	2+.5	20.1	56.5	0	68	23	23
Cyanazine+Chlorsulfuron	2+0.06	30.7	57.0	0	98	100	98
Control		17.1	56.5	0	0	0	0
Hexazinone+Metribuzin	.75+.5	24.2	56.0	0	94	43	56
Hexazinone+Chlorsulfuron	.75+0.06	26.7	57.0	3	100	99	99
Hexazinone+Diuron	.5+1	20.8	56.5	3	90	21	19
Chlorsulfuron	.12	29.3	57.5	1	100	100	98
Chlorsulfuron	0.06	28.4	56.5	0	100	100	86
Chlorsulfuron	0.03	26.3	56.5	0	98	98	60
Mean		24.0	56.6	0	76	47	43
High mean		30.7	57.5	3	100	100	99
Low mean		17.1	56.0	0	0	0	0
Coeff. of variation		21.5	0.	363	26	50	55
LSD(1 Percent)		9.9	0.	3	38	45	45
LSD(5 Percent)		7.4	0.	2	29	34	34
No. of reps		4.0	1.0	4	4	4	4

Summary

Residual false chamomile control was excellent with chlorsulfuron alone and in combination with cyanazine or hexazinone. Wheat yields were increased 9 to 13 bu/A by treatments containing chlorsulfuron.

Wheat on cyanazine fallow treatments, Fargo 1980-81. Fallow herbicides were applied on wheat stubble May 30, 1980. Precipitation totalled 13.8 inch during the 11 month period between herbicide application and wheat seeding. The Wheat was seeded April 24, 1981 into untilled soil. Wheat injury and stand reduction were evaluated July 6. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 17 ft.

Treatment	Rate lb/A	-----Wheat----- %ir	%sr	1980 % Cont
Cyanazine(4LW)+Atrazine(L)+2,4-D	2+.5+.5	0	0	71
Cyanazine(4LO)+Atrazine(L)+2,4-D	2+.5+.5	0	1	80
Cyanazine(WP)+Atrazine(L)+2,4-D	2+.5+.5	0	1	92
Cyanazine(4LW)+Atrazine(WP)+2,4D	2+.5+.5	0	4	83
Cyanazine(WP)+Atrazine(WP)+2,4-D	2+.5+.5	0	0	80
Cyan(4LW)+Atrazine(L)+Paraquat	2+.5+.5	0	10	100
Cyan(4LW)+Atrazine(WP)+Paraquat	2+.5+.5	0	3	100
Cyan(WP)+Atrazine(WP)+Paraquat	2+.5+.5	0	3	100
Cyan(4LW)+Atrazine(L)+2,4-D+Par	4+.8+1+1	1	4	100
Control		0	0	0
Mean		0	3	81
High mean		1	10	100
Low mean		0	0	0
Coeff. of variation		632	136	7
LSD(1 Percent)		2	7	11
LSD(5 Percent)		1	5	8
No. of reps		4	4	4

Summary

No cyanazine-atrazine treatment reduced wheat stand over 10% with a 11 month interval between application and seeding.

Wheat on cyanazine fallow treatments, Minot 1980-81. Fallow herbicides were applied on wheat stubble May 20, 1980. Precipitation totalled 15.1 inch during the 11 month period between herbicide application and wheat seeding. The entire experimental area was tilled and Coteau wheat seeded April 24, 1981. Wheat injury and stand reduction were evaluated June 22. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 20 ft.

Treatment	Rate lb/A	Wheat %ir	Wheat %sr	1980 % Cont
Cyanazine(4LW)+Atrazine(L)+2,4-D	2+.5+.5	0	3	92
Cyanazine(4LO)+Atrazine(L)+2,4-D	2+.5+.5	0	3	100
Cyanazine(WP)+Atrazine(L)+2,4-D	2+.5+.5	0	0	88
Cyanazine(4LW)+Atrazine(WP)+2,4D	2+.5+.5	0	1	94
Cyanazine(WP)+Atrazine(WP)+2,4-D	2+.5+.5	0	8	90
Cyan(4LW)+Atrazine(L)+Paraquat	2+.5+.5	0	1	100
Cyan(4LW)+Atrazine(WP)+Paraquat	2+.5+.5	0	5	99
Cyan(WP)+Atrazine(WP)+Paraquat	2+.5+.5	1	3	99
Cyan(4LW)+Atrazine(L)+2,4-D+Par	4+.8+1+1	0	0	99
Control		0	0	0
Mean		0	2	86
High mean		1	8	100
Low mean		0	0	0
Coeff. of variation		632	196	4
LSD(1 Percent)		2	9	8
LSD(5 Percent)		1	6	6
No. of reps		4	4	4

Summary

No cyanazine-atrazine treatment reduced wheat stand over 10% with an 11 month interval between application and seeding.

Wheat on cyanazine fallow treatments, Williston 1980-81. Fallow herbicides were applied on wheat stubble May 19, 1980. Precipitation totalled 12.0 in. during the 11 month period between herbicide application and wheat seeding. Waldron wheat was seeded April 15. Wheat injury and stand reduction were evaluated July 9. The experiment was a randomized complete block with 4 replications and experimental units were 8 by 17 ft.

		------------Wheat-----------				
Treatment	Rate lb/A	Yield bu/A	Twt lb/bu	%ir	%sr	% Cont 1980
Cyan(4LW)+Atrazine(L)+2,4-D	2+.5+.5	34.0	58.3	0	0	82
Cyan(4LO)+Atrazine(L)+2,4-D	2+.5+.5	30.7	58.2	0	10	88
Cyan(WP)+Atrazine(L)+2,4-D	2+.5+.5	31.5	58.4	0	0	68
Cyan(4LW)+Atrazine(WP)+2,4-D	2+.5+.5	31.8	58.3	0	1	81
Cyan(WP)+Atrazine(WP)+2,4-D	2+.5+.5	31.8	58.7	0	3	74
Cyan(4LW)+Atrazine(L)+Paraquat	2+.5+.5	32.2	58.7	0	0	74
Cyan(4LW)+Atrazine(WP)+Paraquat	2+.5+.5	30.3	59.0	0	0	66
Cyan(WP)+Atrazine(WP)+Paraquat	2+.5+.5	28.9	58.5	0	0	62
Cyan(4LW)+Atra(L)+2,4-D+Para	4+.8+1+1	32.0	58.2	0	5	89
Control		26.7	58.6	0	0	0
Mean		31.0	58.5	0	2	68
High mean		34.0	59.0	0	10	89
Low mean		26.7	58.2	0	0	0
Coeff. of variation		10.1	0.	0	133	9
LSD(1 Percent)		6.1	0.	0	5	12
LSD(5 Percent)		4.6	0.	0	4	9
No. of reps		4.0	1.0	4	4	4

Summary

No cyanazine-atrazine treatment reduced wheat stand over 10% with an 11 month interval between application and seeding.

Conventional verses no-till production of several crops, Fargo 1981. Trials were established in silty clay soil (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.

			----Conventional----		-------No-till------	
Crop	Variety	Seeding date	Stand Plants/3ft	Yield Units/A	Stand Plants/3ft	Yield Units/A
Wheat	Era	4/28	112	34.1bu	116	34.2bu
Barley	Park	4/28	85	53.6bu	85	53.5bu
Flax	Culbert	5/04	87	16.1bu	72	16.0bu
Corn	Agsco2XA1	5/19	4	66.1bu	4	72.1bu
Sunflowers	894	5/19	5	--	6	--
Soybeans	Evans	5/19	13	23.8bu	10	25.4bu
Sugarbeet	Hillshog monica	5/15	6	15.8T	7	14.6T

Summary

Corn yield was significantly higher under no-till than conventional-till in 1981. Yield of flax, wheat, barley, soybeans, or sugarbeets were similar under both tillage systems.

Conventional verses no-till wheat, Fargo 1981. Trials were established in silty clay soil in 1980 (experiment initiated 1977) to compare conventional and no-till production of seven crops. Era wheat was seeded on this same plot area April 24, 1981. The entire experimental area was treated with diclofop plus bromoxynil when the wheat was in the 3-leaf stage. The expiment was a split block with a randomized block design with 4 replications and experimental units were 15 by 40 ft.

	-------------Wheat-------------				-------Weeds/3 sq ft------			
	Plants/3ft row		Yield bu/A		---Yeft---		---Kocz---	
1980 Crop	CT	NT	CT	NT	CT	NT	CT	NT
Wheat	88	116	34.1	32.7	22	30	0	1
Barley	105	112	42.0	39.3	25	36	0	1
Flax	93	103	37.3	40.5	33	52	1	1
Corn	114	105	44.6	43.1	25	33	0	3
Soybeans	130	120	45.9	45.4	23	40	0	2
Sunflowers	125	122	44.9	44.8	15	36	1	2
Sugarbeets	131	118	44.3	42.4	16	40	0	5
Mean	112	114	41.9	41.1	23	38	0	2
LSD(0.05) Till =	NS		NS		10		0.7	
Crop =	11		4		17		2	
Crop*Till =	17		NS		NS		3	

Summary

Wheat stand counts and yield were similar in conventional or no-till treatments when averaged over previous crop. Wheat yields ranged from 36 to 46 bu/A under conventional-till and 33 to 45 bu/A under no-till depending on previous crop. Weed counts were higher in no-till than conventional-till treatments and were influenced by previous crop.

Fall herbicides for weed control in no-till wheat, Fargo 1980-81. Treatments were applied in wheat stubble (3000 lb/A residue) September 26, 1980 and Era wheat seeded April 24, 1981 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 July 1.

		--------Wheat--------				----Plant density/----		
Treatment	Rate lb/A	Yield bu/A	%ir	%sr	% Cont Fxtl	3ftrow Wheat	3square Fxtl	feet Wioa
Cyanazine 80W	2	32.3	0	0	29	51	186	12
Cyanazine 80W	2.5	32.9	0	0	55	66	145	6
Cyanazine 4L	2	35.6	0	0	29	71	181	9
Cyanazine 4L	2.5	43.0	0	0	61	69	171	5
Pendimethalin	1.5	38.6	0	0	69	74	80	5
Oryzalin	1	45.2	0	0	73	68	39	10
Chlorsulfuron	0.03	50.8	0	0	98	72	23	12
Chlorsulfuron	0.06	53.0	3	5	98	76	12	6
Control		25.8	0	0	0	54	214	7
Mean		39.7	0	1	57	67	117	8
High mean		53.0	3	5	98	76	214	12
Low mean		25.8	0	0	0	51	12	5
Coeff. of variation		18.6	600	346	21	24	24	57
LSD(1 Percent)		14.6	3	4	24	31	55	9
LSD(5 Percent)		10.8	2	3	18	23	40	6
No. of reps		4.0	4	4	4	4	4	4

Summary

Foxtail control was excellent with chlorsulfuron at 0.03 to 0.06 lb/A. Wheat yields were 25 to 28 bu/A higher in chlorsulfuron treated than control plots.

Weed control in no-till wheat, Williston 1980-81. Fall glyphosate (F) was applied October 14 and spring glyphosate and 2,4-D (S) April 23 to 2 to 3in tansy mustard prior to seeding Len wheat on April 30. Postemergence treatments were applied on May 18 to wheat in the 3-leaf stage. All treatments were applied with a bicycle wheel plot sprayer delivering 8.5 gpa at 35psi. The experiment was a randomized complete block with 3 replications. Weed densities were variable from light to heavy.

Treatment	Rate oz/A	----Wheat--- Yield bu/A	Twt lb/bu	------Percent Tamu	Mesl	Prlt	control------ Grft	Dobr
Bromoxynil+Diclofop	6+16	0.6	0.	47	7	60	96	0
MCPA+Bromoxynil	6+6	3.2	59.6	75	80	86	0	0
Glyphosate (F)	6	14.9	56.6	94	98	37	0	99
Glyp(F)+MCPA+Diclofop	6+6+16	22.2	56.8	96	99	98	63	99
Glyp(F)+MCPA+Bromoxynil	6+6+6	23.1	57.3	99	99	98	0	91
2,4-D (S)	12	21.8	58.5	100	100	100	0	0
2,4-D(S)+Brox+Diclofop	12+6+16	22.4	59.0	100	100	100	63	0
2,4D(S)+MCPA+Bromoxynil	12+6+6	23.6	58.7	100	100	100	0	0
Glyphosate (S)	6	7.2	58.0	96	70	55	0	99
Glyp(S)+Brox+Diclofop	6+6+16	7.1	58.4	92	78	70	96	99
Glyp(S)+MCPA+Bromoxynil	6+6+6	14.3	59.0	98	93	94	0	99
Control		0.5	0.	0	0	0	0	0
Mean		13.4	48.5	83	77	75	27	49
High mean		23.6	59.6	100	100	100	96	99
Low mean		0.5	0.	0	0	0	0	0
Coeff. of variation		26.0	0.	9	8	16	80	6
LSD(1 Percent)		8.0	0.	17	14	28	49	7
LSD(5 Percent)		5.9	0.	12	10	21	36	5
No. of reps		3.0	1.0	3	3	3	3	3

Summary

Weed control was good with fall applied glyphosate or spring applied 2, 4-D. Wheat stands were good in fall glyphosate or spring 2,4-D but only 50% in spring glyphosate and less than 5% in the controls. Wheat yields were generally a reflection of tansy mustard control.

Influence of tillage and herbicides on weeds, Fargo 1981. The experiment was established the fall of 1977. Tillage and herbicides have been applied to the same area each year (except chlorsulfuron was first applied Oct 20, 1979). In 1981, Era wheat was seeded and paraquat applied April 24. Diclofop was applied to 2 to 3-leaf wild oat and foxtail May 22 and 2,4-D to 4 to 6 inch broadleaf weeds June 8.

	Wheat									
	Plants/3 ft row					bu/A				
Tillage	None	Dicl	2,4-D	Di+D	Mean	None	Dicl	2,4-D	Di+D	Mean
NT-Clsu	121	131	110	123	121	46.8	48.0	44.4	49.3	47.1
NT-Para	60	70	74	89	73	20.3	26.5	23.1	41.9	28.0
Disc	50	58	73	90	68	18.9	30.8	26.7	41.0	29.3
Plow	50	68	72	81	73	23.2	38.4	26.2	40.5	32.1
Chisel plow	64	67	70	100	75	16.5	29.4	17.1	39.7	25.7
Mean	69	79	80	97		25.1	34.6	27.5	42.5	
LSD (0.05) Till =			16					5		
Herb =			11					4		
Till*Herb =			24					8		

	Weed counts/3 sq ft									
	Fxtl					Cath				
Tillage	None	Dicl	2,4-D	Di+D	Mean	None	Dicl	2,4-D	Di+D	Mean
NT-Clsu	6	4	8	1	5	0	0	0	0	0
NT-Para	95	15	84	22	54	8	4	2	2	4
Disc	76	7	74	21	45	8	5	1	0	4
Plow	44	17	53	15	32	0	0	0	0	0
Chisel plow	46	13	42	8	27	5	2	1	2	3
Mean	54	11	52	13		4	2	1	1	
LSD (0.05) Till =			14					2		
Herb =			18					1.5		
Till*Herb =			50					3		

	Wioa					Kocz				
NT-Clsu	14	0	8	0	5	0	0	0	0	0
NT-Para	15	2	24	3	11	9	11	0	2	5
Disc	16	0	21	4	10	8	15	1	2	7
Plow	21	4	20	3	12	3	6	1	1	3
Chisel plow	29	3	36	3	18	4	8	1	1	3
Mean	19	2	20	3		5	8	1	1	
LSD (0.05) Till =			5					2		
Herb =			7					2		
Till*Herb =			9					4		

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 notill paraquat plots than in plowed or chlorsulfuron treated plots especially without 2,4-D. Wheat yields were higher in notill plots treated with chlorsulfuron than in any other tillage treatment regardless of postemergence herbicide.

Weed control in no-till sunflowers, Minot 1981. Sundac sunflowers were seeded and preemergence treatments applied May 19. Postemergence treatments were applied to 1 to 2 inch weeds and 2-leaf sunflowers June 15. Herbicides were applied with a bicycle wheel plot sprayer delivering 17 gpa at 35 psi except diclofop and BAS-9052 were applied in 8.5 gpa. The experiment was a randomized complete block with 4 replications. Weed densities were moderate to heavy.

Treatment	Application	Rate lb/A	Sunflower Yield lb/A	%ir	Twt lb/A	Plant /Acre	--% Kocz	Control-- Grft	Ruth
Glyphosate+S	PE	0.37+.5%	434	0	28.5	12090	16	28	0
Glyphosate+Alachlor+S	PE	0.37+2.5+.5%	719	0	28.0	12480	18	78	0
Glyphosate+Propachlor+S	PE	0.37+4+.5%	336	0	29.0	13260	13	68	0
Glyphosate+Pend+S	P	0.37+1.5+.5%	891	0	29.0	13650	76	74	20
Glyphosate+Oryzalin+S	PE	0.37+1.5+.5%	518	0	29.0	14170	38	69	85
Glyphosate+Chloramben+S	PE	0.37+2+5%	496	0	28.5	13000	44	68	50
Glyp+Pend+Clam+S	PE	0.37+1.5+1.5+.5%	967	0	29.0	10400	76	86	70
Glyp+Pend+Linuron+S	PE	0.37+1.5+1.5+.5%	1106	4	28.5	11440	95	89	71
Glyp+Pend+Oxyf+S	PE	0.37+1.5+0.25+.5%	854	0	29.0	10400	79	75	85
Glyp+Pend+R40244+S	PE	0.37+1.5+0.5+.5%	1387	0	30.0	11440	98	76	90
Glyphosate+S PE+Dicl	P	0.37+.5%+1.25	288	0	28.5	13130	0	98	0
Glyp+S PE+Bas9052+OC	P	.37+.5%+.37+.25G	453	0	28.5	11700	4	99	0
Control weedy			493	0	29.0	12480	0	0	0
Control Handweeded			1303	0	30.0	13390	99	99	99
Mean			732	0	28.9	12359	47	72	41
High mean			1387	4	30.0	14170	99	99	99
Low mean			288	0	28.0	10400	0	0	0
Coeff. of variation			26	748	0.	15	34	23	40
LSD(1 Percent)			363	4	0.	3495	30	32	31
LSD(5 Percent)			272	3	0.	2612	22	24	23
No. of reps			4	4	1.0	4	4	4	4

Summary

Broadspectrum weed control was good with pendimethalin in combination with linuron, chloramben, oxyfluorfen, and R-40244. Sunflower yields generally related to weed control.

Weed control in no-till sunflowers, Mott 1981. Sunflowers were seeded and preemergence treatments applied May 18. Postemergence treatments were applied to 1 to 2 inch weeds and 2-leaf sunflowers June 11. Herbicides were applied with a back pack sprayer delivering 17 gpa at 35psi except diclofop and BAS-9052 were applied in 8.5 gpa. The experiment was a randomized complete block with 4 replications. Weed densities were heavy. Precipitation for a two week period following PE and post treatments totalled 1.1 and 1.8 inch, respectively.

			------Percent	control-----			Sunflower
		Rate	--Total	veg--	Ruth	Grft	Injury
Treatment	Application	lb/A	June11	July16	------August	5------	
Glyphosate	PE	0.37	84	62	56	55	0
Glyphosate+Pend	PE	0.37+1.5	92	77	82	72	0
Glyphosate+Alachlor	PE	0.35+2.5	96	79	75	75	0
Glyphosate+Oryzalin	PE	0.37+1.5	97	86	94	85	0
Glyp+Chloramben	PE	0.37+1.5	97	79	82	78	0
Glyp+Propachlor	PE	0.37+4	80	59	72	42	0
Glyp+Pend+Linuron	PE	0.37+1.5+1.5	95	70	67	87	38
Glyp+Pend+Chloramben	PE	0.37+1.5+1.5	100	96	95	99	0
Glyphosate+Pend+Oxyf	PE	0.37+1.5+0.25	100	80	82	78	0
Glyp+Pend+R-40244	PE	0.37+1.5+0.5	95	82	88	82	0
Glyphosate+Diclofop	PE+P	0.37+1.5	92	72	55	94	0
Glyphosate+BAS-9052	PE+P	0.37+0.37	81	58	52	70	0
Weedy control			0	0	0	0	0
	LSD (0.05)		20	22	21	20	5

Summary

Linuron at 1.5 lb/A was the only treatment which injured sunflowers. Broadspectrum weed control was good with oryzalin or pendimethalin combinations with chloramben or R-40244.