SURVEY OF WEED CONTROL AND PRODUCTION PRACTICES ON SUGARBEET IN WESTERN NORTH DAKOTA AND EASTERN MONTANA IN 2007

Aaron L. Carlson, John L. Luecke, Mohamed F.R. Khan, and Alan G. Dexter

Sugarbeet Research Technician, Sugarbeet Research Specialist, Extension Sugarbeet Specialist, and Extension Sugarbeet Specialist

North Dakota State University and the University of Minnesota
Fargo

The twelfth weed control and production practices questionnaire was mailed in September 2007 to sugarbeet growers in western North Dakota and eastern Montana. The last survey was conducted in 2005. Growers were requested to evaluate weed control and sugarbeet injury from specific herbicides, list total sugarbeet acreage, and indicate the most important production and weed problems from this past growing season. Growers planted 35,115 acres of sugarbeet in western North Dakota and eastern Montana in 2005. Twenty-one growers representing 24% of the total acres responded to the survey. Other portions of the survey are reported in the Entomology and Plant Pathology sections.

Table 1 is a summary of herbicide use and performance averaged over all counties. The number of growers reporting the use of a herbicide treatment is listed and the acres treated are expressed as a percentage of the total reported acreage. Multiple herbicide treatments are tabulated for each herbicide treatment, thus the number of growers reporting in Table 1 exceeds the total number of responses. Also, multiple herbicide treatments on the same acreage are listed separately in the tables, thus acres treated exceeds 100%. The ratings of weed control and sugarbeet injury are presented as the percentage of growers who judged weed control as excellent, good, fair, or poor and injury as none, slight, moderate, or severe.

The trade names listed in Table 1 for the herbicides are the original trade names. These old trade names also represent the generic formulations of the same active ingredient. Thus Nortron represents Etho SC and Ethotron; Betamix represents D-P Mix and Phen-Des; Betanex represents Des and Alphanex; Progress represents Des-Phen-Etho; Stinger represents ClopyrAg; and Select represents Select Max, Prism, and Arrow.

Total sugarbeet acreage treated with herbicides was 411% of the total acreage reported in 2007 (Table 1). Sugarbeet acreage treated with herbicides was 400% in 2005, 440% in 2003, and 408% in 2001. The acreage treated with soil applied herbicides (not including Roundup) was 53% in 2007, largely due to PRE/PPI Nortron use. The acreage treated with soil applied herbicides has increased from 10% in 1999, to 11% in 2001, 60% in 2003, and 35% in 2005. Postemergence herbicide use was 277% in 2007, 311% in 2005, 312% in 2003, and 335% in 2001. Betanex was used on 12% of the acreage in 2007, 5% in 2005, 9% in 2003, and 72% in 2001. Betamix was used on 13% of the acreage in 2007, 80% in 2005, 45% in 2003 and 106% in 2001. Progress was used on 230% of the acreage in 2007, 183% in 2005, 248% in 2003, and 130% in 2001. Progress is probably used on more acres than Betamix or Betanex because of the prevalence of kochia as the worst weed problem in this region. UpBeet was used on 245% of the acreage in 2007, 248% in 2005, 285% in 2003, and

303% in 2001. Stinger was also used on 245% of the acreage in 2007, 269% in 2005, 302% in 2003, and 269% in 2001. Select was applied to 84%, Poast to 99%, and Assure II to 6% of the acreage in 2007. Preemergence Roundup was used on 81% of the acreage in 2007, 54% in 2005, 64% in 2003, and 61% in 2001.

The treatments in Table 1 that were applied with oil adjuvant (oil) are the micro-rate or mid-rate treatments. These were used on 196% of the acreage in 2007, 151% in 2005, 251% in 2003, and 275% in 2001. The most common herbicide treatment, Progress+Stinger+UpBeet+Poast+Oil, was used on 99% of the acres reported. Weed control was rated as poor or fair by 35% of respondents in 2007, 27% in 2005, 17% in 2003, and 45% in 2001. Severe sugarbeet injury was not reported for any of the herbicide treatments in 2007.

Averaged over all herbicides applied in 2007, 43% were band applied and 57% were broadcast applied with a ground sprayer (Table 2). No respondents reported application of herbicides by aircraft.

A summary of the most serious production problem responses from 1989 to 2007 is shown in Table 3. In 2007, 44% of respondents indicated weeds as their most serious production problem in sugarbeet. Root diseases were named as worst problem by 17% and emergence/stand by 11% of the respondents. Cercospora was named as worst problem by 39% of the respondents in 2001, but only 6% of the respondents indicated cercospora as their worst problem in 2007. This indicates that the fungicides available for cercospora control are giving good control of this disease.

Kochia was named as worst weed by 75% of the survey respondents in 2001, the same as in 2005 (Table 4). Kochia continues to be the worst weed problem. Common lambsquarters was second in 2007 with 15% of the respondents naming it as worst weed.

Hand weeding continues to be a common weed control practice as 51% of the acres reported received some hand weeding (Table 5). The cost per acre ranged from zero to over $60/A (Table 6). The approximate average cost per acre for all respondents as calculated from Table 6 was $29/A. The use of hand labor was greater in 2007 than in 2005 since 50% of the respondents did not pay for hand labor in 2005, but only 29% of respondents did not pay for hand labor in 2007. The approximate average cost per acre for respondents who paid for hand weeding was $41/A.

The sugarbeet acres produced by survey respondents varied from less than 50 acres to greater than 1000 acres (Table 7). The approximate average number of sugarbeet acres per respondent as calculated from Table 7 was 414 acres in 2007.

Row crop cultivation was used by 94% of survey respondents in 2007 (Table 5). Six percent of respondents indicated zero cultivations per field which is the largest percentage since the question began being asked on the survey. Two cultivations was the most common response by 63% of respondents. The average number of cultivations was 1.7 per field.

TABLE 1. SUMMARY OF ALL HERBICIDES USED IN MONTANA SUGARBEET REPORTED IN 2007.
21 GROWERS REPORTED ON 8346 ACRES.

HERBICIDES (IN ORDER OF ACRES TREATED)	NUMBER GROWERS RPTG.	ACRES TREATED % OF TOTAL	Avg no. of appl	% GROWERS REPORTING WEED CONTROL					% GROWERS REPORTING CROP INJURY				
				NR*	EXC	GD	FR	PR	NR	None	Slt	Mod	Sev
A. SOIL APPLIED HERBICIDES:													
NORTRON(PRE/PPI)	8	40.7	1.0	38	0	50	0	13	38	13	50	0	0
EPTAM+RO-NEET	1	1.2	1.0	100	0	0	0	0	100	0	0	0	0
RO-NEET	1	0.3	1.0	0	0	100	0	0	0	100	0	0	0
TOTAL-PPI&PRE	10	42.2	1.0	40	0	50	0	10	40	20	40	0	0
B. POSTEMERGENCE HERBICIDES:													
PROG+STING+UPB+POAST+OIL	4	99.4	2.5	0	0	25	75	0	0	0	50	50	0
PRG+STG+UPB+SLCT+NORT+OIL	4	47.0	3.0	25	0	0	50	25	25	25	50	0	0
PROGRESS+STINGER+UPBEET	4	39.8	2.5	0	0	50	50	0	0	0	75	25	0
SELECT	5	21.8	1.2	20	60	20	0	0	20	40	40	0	0
PROG+STING+UPB+NORT+OIL	2	15.1	2.0	0	50	0	50	0	0	0	50	50	0
PROG+STING+UPB+SLCT+OIL	3	14.4	3.0	33	0	33	33	0	33	0	0	67	0
PROGRESS	1	8.4	2.0	0	0	0	100	0	0	0	100	0	0
BMIX+STING+UPB+NORT+OIL	1	6.8	1.0	100	0	0	0	0	100	0	0	0	0
BNEX+STNG+UPB+ASURE+OIL	1	6.3	1.0	0	100	0	0	0	0	0	0	100	0
PROG+STING+UPBEET+OIL	1	6.2	1.0	0	0	100	0	0	0	0	100	0	0
BETANEX+STINGER+UPBEET	1	4.8	1.0	0	0	100	0	0	0	0	100	0	0
BETAMIX+STINGER+UPBEET	1	4.2	1.0	0	0	100	0	0	0	0	100	0	0
BETANEX	1	1.0	1.0	100	0	0	0	0	100	0	0	0	0
BMIX+STNG+UPB+SLCT+OIL	1	1.0	1.0	100	0	0	0	0	100	0	0	0	0
BETAMIX	1	0.9	3.0	0	0	100	0	0	0	0	100	0	0
TOTAL-POST	31	277.2	2.0	19	16	29	32	3	19	10	48	23	0
C. PREEMERGE & LAY-BY HERBICIDES:													
ROUNDUP (PRE)	15	80.9	1.1	20	40	27	13	0	33	67	0	0	0
OUTLOOK (LAY-BY)	2	10.8	1.0	0	0	50	0	50	0	50	50	0	0
TOTAL-PRE&LAY-BY	17	91.7	1.1	18	35	29	12	6	29	65	6	0	0
D. OTHER WEED CONTROL METHODS:													
SWATH/FLAIL/MOW	2	0.5	1.0	50	0	0	0	50	50	0	0	0	50
TOTAL-OTHER	2	0.5	1.0	50	0	0	0	50	50	0	0	0	50
TOTAL TREATMENTS	60	411.5	1.6	23	18	32	20	7	83	0	0	0	83

*NR=NO RESPONSE; EXC=EXCELLENT; GD=GOOD; FR=FAIR; PR=POOR.

Table 2. Method of herbicide application in sugarbeet in 2007.

Herbicide	Acres treated	Band	Broadcast with ground sprayer	Broadcast with aerial application
		----------% of acres treated----------		
Nortron	2130	60	40	-
Select	900	39	61	-
Bnex/Bmix/Prog+Stinger+UpBeet+Nort+Grass	2793	-	100	-
Bnex/Bmix/Prog+Stinger+UpBeet+Nortron	1260	86	14	-
Bnex/Bmix/Prog+Stinger+UpBeet+Grass	8955	55	45	-
Bnex/Bmix/Prog+Stinger+UpBeet	4592	66	34	-
Betanex/Betamix/Progress	775	90	10	-
Outlook (Lay-By)	898	55	45	-
Roundup (PRE)	4981	-	100	-
Ro-Neet	25	100	-	-
Total	27309	43	57	0

Table 3. A summary of the most serious production problem responses from 1989 to 2007.

Year	Number of Respondents	Weeds	Weather	Root Diseases[1]	Labor Management	Emergence/ Stand	Cercospora Leaf Spot	No Problem
		----------% of respondents ----------						
2007	18	44	6	17	6	11	6	5
2005	21	48	10	10	0	14	0	5
2003	41	36	7	22	5	10	5	12
2001	64	23	3	6	2	25	39	0
1999	45	42	2	11	0	9	24	2
1997	46	24	15	10	0	22	20	2
1995	61	44	5	5	2	13	26	3
1993	56	21	18	7	4	23	12	9
1992	64	28	8	5	0	36	11	3
1991	84	23	0	25	5	6	24	2
1990	70	41	13	11	6	10	0	9
1989	81	20	5	22	6	21	0	14

[1]Root Diseases include rhizoctonia, aphanomyces, and rhizomania.

Table 4. A summary of the worst weed responses from 1989 to 2007.

Year	Number of Responses	RRPW[1]	COLQ	KOCZ	NISH	WIOA
		----------% of responses----------				
2007	20	5	15	75	0	0
2005	24	8	13	75	0	0
2003	44	11	16	61	0	0
2001	64	14	16	62	2	0
1999	47	19	21	45	2	2
1997	43	58	16	12	5	0
1995	63	52	3	29	0	5
1993	58	17	17	28	3	12
1992	69	35	12	33	3	6
1991	84	43	7	26	10	2
1990	70	46	10	23	4	3
1989	81	43	11	22	3	1

[1]RRPW=redroot pigweed, COLQ=common lambsquarters, KOCZ=kochia, NISH=nightshade, WIOA=wild oat

Table 5. A summary of hand weeded acres as a percent of acres planted in eastern Montana and western North Dakota from 1989 to 2007.

Year	Respondent Acres Planted	Hand Weeded
		% of acres planted
2007	8,346	51
2005	7,733	41
2003	11,732	38
2001	22,125	23
1999	12,296	21
1997	11,059	26
1995	12,338	51
1993	9,242	62
1992	12,791	76
1991	15,784	85
1990	12,607	78
1989	15,857	89

Table 6. A summary of the cost of hand weeding plus hand thinning from 1991 to 2007.

		Dollars per Acre												
Year	Responses	0	1-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	>60
	number	----------% of respondents----------												
2007	21	29	0	4	0	10	14	10	0	0	14	0	10	10
2005	24	50	0	4	4	8	4	4	4	3	8	4	8	0
2003	38	39	0	5	11	13	0	11	16	3	0	0	0	3
2001	65	69	2	0	3	6	8	3	5	0	2	0	2	2
1999	47	68	0	4	17	4	2	0	2	2	0	0	0	0
1997	43	49	0	9	14	2	12	0	2	0	0	0	5	7
1995	53	41	8	8	13	11	6	2	0	0	4	2	0	6
1993	46	15	4	13	2	11	4	0	0	0	2	24	15	9
1992	54	0	4	11	9	11	6	2	4	4	11	22	11	6
1991	73	0	0	8	3	7	0	1	3	0	8	29	18	23

Table 7. A summary of sugarbeet acres produced by survey respondents from 1997 to 2007.

		Sugarbeet Acres									
Year	Responses	1-49	50-99	100-199	200-299	300-399	400-599	600-799	800-999	1000-1500	>1500
	number	----------% of respondents----------									
2007	21	5	19	5	19	10	24	0	14	5	0
2005	24	4	13	17	13	38	8	4	0	4	0
2003	44	11	16	21	11	24	5	5	3	5	0
2001	64	5	15	28	20	9	5	11	2	5	2
1999	47	2	17	28	23	11	8	4	4	2	0
1997	43	4	23	25	12	25	8	0	2	0	0

Table 8. A summary of the number of row crop cultivations per field for weeds from 1989 to 2007.

		Number of cultivations					
Year*	Responses	0	1	2	3	4	5
	number	----------% of respondents----------					
2007	19	6	26	63	6	0	0
2001	64	2	16	69	13	0	0
1999	47	2	24	60	13	0	0
1997	43	2	0	43	55	0	0
1989	81	0	0	26	53	20	1

*This question was not present on surveys from 2005, 2003, 1995, 1993, 1992, 1991, and 1990