

Alan G. Dexter and John L. Luecke

Extension Sugarbeet Specialist and Sugarbeet Research Specialist, North Dakota State University and the University of Minnesota, Fargo, ND

The micro-rate is a widely used herbicide treatment that generally includes Betanex or Betamix or Progress plus UpBeet plus Stinger plus a herbicide for grass control plus methylated seed oil adjuvant applied three to five times at a seven-day interval at reduced rates. Kochia, common lambsquarters and redroot pigweed are the weeds that most commonly are not adequately controlled by micro-rate treatments. For most sugarbeet growers, adequate control would be considered to be 99 to 100% control.

Two experiments were established at Crookston, Grand Forks, Mooreton, Morris, Prosper, Reynolds, and St. Thomas. The objective of the experiments was to determine weed control and sugarbeet injury from the standard micro-rate and soil applied herbicides followed by POST herbicide treatments. The planting dates, herbicide treatment dates and conditions at treatment are provided in Table 1. Counter 15G at 12 lb/A was applied modified-in-furrow on the planter at all locations. Herbicides were applied to the center four rows of six-row plots in 17 gpa of water at 40 psi through 8002 nozzles at 3 mph. Roundup was applied over a Roundup Ready variety at St. Thomas to give total weed control and allow evaluation of sugarbeet injury from the herbicides without significant weed competition. Treatments were replicated four times. Weed control and sugarbeet injury were evaluated visually at each location. The cost of the herbicide treatments in Tables 2 and 3 only includes the cost of the herbicides, not the cost of application. Costs are for broadcast application, not band application. The treatments in Tables 2 and 3 are numbered for easier reference in the following discussion.

Goltix is a herbicide that was first registered in Europe in 1975 by Bayer but is not registered in the United States. Goltix does not control a broad spectrum of weeds but it has activity on common lambsquarters and kochia, two of the major weed problems in North Dakota and Minnesota sugarbeet. Makhteshim-Agan is the company presently investigating the potential market for Goltix in the United States.

The standard micro-rate treatment with Progress applied four times is Treatment 1 in Table 2. The standard micro-rate gave excellent control of common lambsquarters at five locations but control at Morris was only 77%. The reason for poor control of common lambsquarters at Morris is not explained by the weed size and environmental data in Table 1. The weeds and sugarbeet were similar in size at application, the temperatures were similar and the soil moisture was similar at Morris and at other locations where common lambsquarters control from the standard micro-rate was 97 to 100%. The poor common lambsquarters control at Morris mirrors the increasingly common reports of inadequate common lambsquarters control from sugarbeet growers.

Common lambsquarters control at Morris (Table 2) was improved over control from the standard micro-rate (Trt 1) by adding 3 fl oz/A of Nortron in each application (Trt 4); by using PRE Nortron ahead of the micro-rate (Trt 6) and by adding Goltix to the micro-rate (Trt 9). The conventional-rate treatments (Trt 2,3,7) gave 100% common lambsquarters control at Morris. PRE Nortron followed by the micro-rate (Trt 6) gave better common lambsquarters control than the POST micro-rate plus extra Nortron (Trt 4,5).

Treatments 2, 3, 5, 7, 8 and 9 gave more sugarbeet injury than the micro-rate averaged over seven locations and at St. Thomas (Table 2). The micro-rate plus Goltix (Trt 9) caused more sugarbeet injury than any other treatment suggesting that the Goltix application rate was too high. However, none of the treatments caused a significant loss in extractable sucrose/A in this experiment at St. Thomas compared to the standard micro-rate which indicates that sugarbeet recovered very well from Goltix injury and the injury from other herbicides. Sugarbeet injury was greater at St. Thomas than at the other six locations probably because the Roundup Ready variety was more susceptible to herbicide injury than the conventional varieties used at the other locations. This does not mean that all Roundup Ready varieties would be more susceptible to conventional sugarbeet herbicides than conventional varieties.

All treatments gave 100% redroot pigweed control at four locations (Table 2) but the conventional rate applied three times (Trt 2) at Reynolds gave less control of redroot pigweed than the other treatments. All other treatments had

four POST applications while Treatment 2 only had three POST applications. The reduced control in Treatment 2 at Reynolds was probably because some redroot pigweed plants emerged between the third and fourth POST application. A similar result was observed with wild proso millet control at Mooreton (Table 2) where all POST treatments with four applications gave 99 to 100% control while Treatment 2 with three POST applications only gave 28% control. This suggests that most of the wild proso millet emerged between the third and fourth POST application.

All treatments that included Select and a methylated seed oil adjuvant (Trt 1, 4-9) gave 100% wild oat control at Crookston (Table 2). The conventional-rate treatments (Trt 2,3), which did not include an adjuvant, gave less control of wild oat indicating that grass control can be lessened by the absence of an adjuvant in conventional-rate treatments.

Kochia control was less than desired with all treatments (Table 2). The best treatment was PRE Nortron followed by the conventional-rate applied four times (Trt 7). This treatment is expensive at \$269/A and the observed 94% kochia control was not adequate to prevent yield loss from kochia competition in the two heavily infested sites at Reynolds and Grand Forks. Treatments 2 through 9 all gave better kochia control than the micro-rate (Trt 1). The micro-rate plus Goltix (Trt 9) gave 85% kochia control, the best control of the POST only treatments, but Goltix is not registered in the USA. The conventional-rate applied four times (Trt 3) gave 76% kochia control, the best control of the registered POST only treatments.

The standard micro-rate treatment applied three times is Treatment 1 and applied four times is Treatment 2 in Table 3. Four applications of the micro-rate gave similar sugarbeet injury and better control of all evaluated weeds than three applications (Table 3). The standard micro-rate applied four times gave 98% common lambsquarters control averaged over five locations but control at Morris was only 72%. The reason for the poor common lambsquarters control is not explained by the application conditions in Table 1.

Common lambsquarters control at Morris (Table 3) was improved over control from the standard micro-rate applied four times (Trt 2) by PPI Dual Magnum at 16 fl oz/A followed by Dual Magnum at 16 fl oz/A plus the micro-rate followed by the micro-rate applied twice (Trt 5) and PRE Nortron at 120 fl oz/A followed by the micro-rate applied three times (Trt 7). Lay-by Dual Magnum (Trt 8) and lay-by Outlook (Trt 9) did not improve common lambsquarters control indicating that late-emerging common lambsquarters was not a reason for poor control.

Treatments 3, 4 and 5 included PRE or PPI Dual Magnum and all caused more sugarbeet injury than the other treatments averaged over seven locations (Table 3). Sugarbeet did not fully recover from this injury and extractable sucrose/A at St. Thomas was less from treatments 3, 4 and 5 than from sugarbeet treated with the micro-rate applied four times. Lay-by Dual Magnum (Trt 8) caused sugarbeet injury similar to lay-by Outlook (Trt 9) averaged over seven locations but sugarbeet extractable sucrose/A was less from lay-by Dual than from Outlook treated plots. Sugarbeet injury was greater at St. Thomas than at the other six locations probably because the Roundup Ready variety was more susceptible to herbicide injury than the conventional varieties used at the other locations.

All treatments gave 100% redroot pigweed control at four locations (Table 3) but the micro-rate applied three times only gave 68% redroot pigweed control at Reynolds (Trt 1). Four applications of the micro-rate gave 99% control (Trt 2) so a flush of redroot pigweed apparently emerged between the third and fourth POST application. Soil-applied Dual Magnum or Nortron and lay-by application of Dual Magnum or Outlook plus three micro-rate applications (Trt 3-9) gave redroot pigweed control similar to POST micro-rate applied four times (Trt 2). At Reynolds, the soil-applied herbicides reduced the needed number of POST applications for redroot pigweed control from four to three. The same observation was also true for yellow foxtail control at Crookston. However, four POST micro-rate applications were needed for optimum control of wild proso millet at Mooreton, probably because wild proso millet is a late-emerging weed that was not adequately controlled by soil-applied Dual Magnum or Nortron.

Kochia control was poor with all treatments (Table 3). The best control in the experiment was from PRE Nortron at 120 fl oz/A followed by three micro-rate applications (Trt 7) but this treatment only provided 67% control. Standard POST rates of Progress are needed to achieve the best possible kochia control.

Common cocklebur at Mooreton and common ragweed at Prosper were totally controlled by all treatments in both experiments (data not shown). The Stinger component of the POST treatments gives excellent control of common cocklebur and common ragweed.

SUMMARY

The standard micro-rate treatment did not provide adequate control of all weeds at all locations but several more rigorous tested treatments in both experiments gave excellent control of all evaluated species except kochia. Nearly all kochia in eastern ND-MN is resistant to ALS-inhibitor herbicides so UpBeet is not providing kochia control. Progress is the best POST treatment and Nortron is the best soil applied treatment for kochia control. However, soil applied Nortron followed by a standard rate of Progress plus other herbicides applied four times failed to provide adequate control of dense populations of kochia at two locations in 2004. This indicates that kochia must be thoroughly controlled in all crops in rotation with sugarbeet to minimize the kochia populations during the year that sugarbeet is produced.

Table 1. Herbicide application dates and conditions, 2004.¹

CROOKSTON					
Date	May 3	June 8	June 15	June 22	June 29
Time of day	1:30 P	12:00 P	11:30 A	11:45 A	12:00 P
Air temperature (F)	55	61	68	61	81
Relative humidity (%)	17	40	53	29	32
6-inch soil temp (F)	45	59	62	60	64
Soil moisture	good	good	good	good	good
Sugarbeet (Crystal 822)	PPI, seed, PRE	V3.2	V9.2	V12.1	V12-14
Redroot pigweed	-	2 lf	3-5 lf	5-7 lf	6" tall
Mapleleaf goosefoot/ common lambsquarters	-	2-4 lf	4-6 lf	4-6" dia	6-8" tall
Yellow foxtail	-	2 lf	4-5 lf	5-6 lf	6-7 lf
Wild oat	-	2" tall	4-5" tall	6-8" tall	8-12" tall
GRAND FORKS					
Date	April 26	May 21	May 28	June 4	June 10
Time of day	2:00 P	10:00 A	11:30 A	12:30 P	11:00 A
Air temperature (F)	42	55	65	79	64
Relative humidity (%)	23	34	25	38	50
6-inch soil temp (F)	37	48	52	60	57
Soil moisture	good	good	good	good	good
Sugarbeet (Hilleshog 2162)	PPI, seed, PRE	V1.0	V1.2-1.8	V1.2-3.1	V2.0-4.0
Kochia	-	cotyl	0.25-0.75" diameter	0.75-1.0" diameter	2" tall
MOORETON					
Date	April 22	May 26	June 14	June 21	June 28
Time of day	12:30 P	3:00 P	2:00 P	10:45 A	9:00 A
Air temperature (F)	47	74	72	60	67
Relative humidity (%)	17	18	33	33	36
6-inch soil temp (F)	42	53	66	61	59
Soil moisture	good	good	good	good	good
Sugarbeet (Hilleshog 2162)	PPI, seed, PRE	V1.0	V2.5	V4-5	V6-8
Common cocklebur	-	cotyl	3-4 lf	cot-4 lf	8" tall
Common lambsquarters	-	4-6 lf	6" tall	8" tall	6-12" tall
Wild proso millet	-	emerging	3 lf	4-5 lf	emerg-6 lf

Table 1. (continued)

MORRIS					
Date	April 23	May 18	May 26	June 3	June 14
Time of day	12:30 P	10:30 A	11:00 A	10:00 A	11:00 A
Air temperature (F)	54	72	72	67	71
Relative humidity (%)	25	23	41	46	42
6-inch soil temp (F)	48	55	54	58	64
Soil moisture	good	good	good	good	good
Sugarbeet (Hilleshog 2162)	PPI, seed, PRE	V1.8	V3.3	V5.5	V11.2
Common lambsquarters	-	4 lf	4-6 lf	4-8 lf	8" tall
Redroot pigweed	-	cotyl	cot-2 lf	2-4 lf	6-8 lf
PROSPER					
Date	April 29	May 27	June 3	June 10	June 17
Time of day	2:00 P	12:00 P	5:00 P	10:15 A	10:20 A
Air temperature (F)	49	57	72	60	69
Relative humidity (%)	22	36	33	52	39
6-inch soil temp (F)	44	52	60	62	60
Soil moisture	fair	good	good	good	good
Sugarbeet (VDH 46177)	PPI, seed, PRE	V1.0-1.2	V1.7	V3.2	V7.1-9.1
Wild oat	-	3-4 lf	4 lf	5-6 lf	6 lf
Common ragweed	-	cotyl	2 lf	4-6 lf	8-10 lf
Common lambsquarters	-	cot - 2 lf	2-6 lf	1-2" tall	2-4" tall
Redroot pigweed	-	cot - 2 lf	2-4 lf	4-8 lf	3" tall
REYNOLDS					
Date	April 27	May 21	May 28	June 7	June 14
Time of day	1:30 P	12:00 P	9:30 A	11:30 A	9:00 A
Air temperature (F)	72	60	61	79	61
Relative humidity (%)	68	32	26	55	65
6-inch soil temp (F)	41	49	50	64	52
Soil moisture	good	good	good	good	good
Sugarbeet (Hilleshog 2162)	PPI, seed, PRE	V1.0-1.1	V1.2-1.4	V2.5-3.5	V4.0-6.5
Common lambsquarters	-	2 lf	cot-4 lf	cot-8 lf	1-2" tall
Redroot pigweed	-	cotyl	cot-2 lf	2-4 lf	1-1.5" tall
Kochia	-	cot-2"	0.5-0.75"	0.75-1"	1-2"
		diameter	diameter	diameter	diameter
ST. THOMAS					
Date	April 28	May 28	June 4	June 10	June 18
Time of day	2:00 P	10:30 A	10:00 A	1:00 P	11:30 A
Air temperature (F)	58	63	76	73	61
Relative humidity (%)	26	31	45	37	26
6-inch soil temp (F)	45	51	54	60	58
Soil moisture	good	good	good	good	good
Sugarbeet (Hilleshog 8277 RR)	PPI, seed, PRE	V1.0-1.5	V1.1-2.1	V2.0-4.1	V8.2-9.2
Redroot pigweed	-	cotyl	cot-2 lf	2 lf	4-5 lf
Common lambsquarters	-	cot-2 lf	cot - 4 lf	4-6 lf	8" tall

¹lf = leaf or leaves, " = inch, V = number of expanded leaves with decimal indicating partial expansion of youngest visible leaf.

Table 2. Sugarbeet injury and weed control from stacking herbicide treatments at seven locations in 2004. (Table continued on next page).

Treatment Rate	7 loc Sugb ⁴ inj	5 loc Colq cntl	Morris Colq cntl	4 loc Rrpw cntl	Reynolds Rrpw cntl
fl oz or oz/A	%	%	%	%	%
1. Progress + UpBeet + Stinger + Select + MSO ¹ 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T4) ²	9	99	77	100	98
2. Progress + UpBeet + Stinger + Select 17.7 (T1)/23.52 (T2)/35.6 (T3) + 0.25 + 2.6 + 3 (T1-T3)	14	99	99	100	90
3. Progress + UpBeet + Stinger + Select 17.7 (T1)/23.5 (T2-T4) + 0.25 + 2.6 + 2 (T1-T4)	14	100	100	100	100
4. Progress + UpBeet + Stinger + Select + MSO + Nortron 5.7 + 0.125 + 1.3 + 2 + 1.5% + 3 (T1-T4)	10	100	93	100	100
5. Progress + UpBeet + Stinger + Select + MSO + Nortron 5.7 + 0.125 + 1.3 + 2 + 1.5% + 3 (T1-T4)	14	100	90	100	100
Progress + Upbeet + Stinger + Select + Z-64 ³ 5.7 + 0.125 + 1.3 + 2 + 1.5% (T3-T4)					
6. Nortron (PRE) 96 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T4)	11	100	99	100	100
7. Nortron (PRE) 96 followed by Progress + UpBeet + Stinger + Select 17.7 (T1)/23.5 (T2-T4) + 0.25 + 2.6 + 2 (T1-T4)	16	100	100	100	100
8. Nortron (PRE) 96 followed by Progress + UpBeet + Stinger + Select + MSO + Nortron 5.7 + 0.125 + 1.3 + 2 + 1.5% + 3 (T1-T2)	15	100	98	100	100
Progress + UpBeet + Stinger + Select + Z-64 5.7 + 0.125 + 1.3 + 2 + 1.5% (T3-T4)					
9. Progress + UpBeet + Stinger + Select + MSO + Goltix 5.7 + 0.125 + 1.3 + 2 + 1.5% + 33 (T1-T4)	23	100	100	100	100
LSD (0.05)	3	NS	5	NS	4

¹Methylated seed oil from Loveland. ²T1 = first POST application; T2 = second POST; etc. ³Methylated seed oil basic pH blend + 28% N + surfactant from AGSCO. ⁴Sugb = sugarbeet; Colq = common lambsquarters; Rrpw = redroot pigweed; Wioa = wild oat; Wipm = wild proso millet

Table 2 (continued).

Treatment Rate	St. Thomas					Approximate broadcast treatment cost
	2 loc Kochia cntl	Crook Wioa ⁴ cntl	Mooreton Wipm cntl	Sugb inj	Extractable sucrose	
fl oz or oz/A	%	%	%	%	lb/A	\$/A
1. Progress + UpBeet + Stinger + Select + MSO ¹ 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T4) ²	49	100	99	26	6000	86
2. Progress + UpBeet + Stinger + Select 17.7 (T1)/23.52 (T2)/35.6 (T3) + 0.25 + 2.6 + 3 (T1-T3)	73	90	28	33	6230	145
3. Progress + UpBeet + Stinger + Select 17.7 (T1)/23.5 (T2-T4) + 0.25 + 2.6 + 2 (T1-T4)	76	94	99	39	5830	190
4. Progress + UpBeet + Stinger + Select + MSO + Nortron 5.7 + 0.125 + 1.3 + 2 + 1.5% + 3 (T1-T4)	58	100	99	26	5960	96
5. Progress + UpBeet + Stinger + Select + MSO + Nortron 5.7 + 0.125 + 1.3 + 2 + 1.5% + 3 (T1-T4)	60	100	99	33	5470	91
Progress + Upbeet + Stinger + Select + Z-64 ³ 5.7 + 0.125 + 1.3 + 2 + 1.5% (T3-T4)						
6. Nortron (PRE) 96 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T4)	72	100	100	28	5750	165
7. Nortron (PRE) 96 followed by Progress + UpBeet + Stinger + Select 17.7 (T1)/23.5 (T2-T4) + 0.25 + 2.6 + 2 (T1-T4)	94	100	100	39	5840	269
8. Nortron (PRE) 96 followed by Progress + UpBeet + Stinger + Select + MSO + Nortron 5.7 + 0.125 + 1.3 + 2 + 1.5% + 3 (T1-T2)	72	100	100	39	6300	170
Progress + UpBeet + Stinger + Select + Z-64 5.7 + 0.125 + 1.3 + 2 + 1.5% (T3-T4)						
9. Progress + UpBeet + Stinger + Select + MSO + Goltix 5.7 + 0.125 + 1.3 + 2 + 1.5% + 33 (T1-T4)	85	100	100	46	5890	-
LSD (0.05)	7	6	15	4	NS	

¹Methylated seed oil from Loveland. ²T1 = first POST application; T2 = second POST; etc. ³Methylated seed oil basic pH blend + 28% N + surfactant from AGSCO. ⁴Sugb = sugarbeet; Colq = common lambsquarters; Rrpw = redroot pigweed; Wioa = wild oat; Wipm = wild proso millet

Table 3. Sugarbeet injury and weed control fro preplant incorporated, preemergence and postemergence herbicides at seven locations in 2004. (Table continued on next page).

Treatment Rate	7 loc Sugb ³ inj	5 loc Colq cntl	Morris Colq cntl	4 loc Rrpw cntl	Reynolds Rrpw cntl
fl oz or oz/A	%	%	%	%	%
1. Progress + UpBeet + Stinger + Select + MSO ¹ 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3) ²	6	94	72	100	68
2. Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T4)	8	98	82	100	99
3. Dual Magnum (PRE) 32 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3)	16	98	80	100	100
4. Dual Magnum (PPI) 32 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3)	23	99	89	100	97
5. Dual Magnum (PPI) 16 followed by Dual Mag + Progress + UpBeet + Stinger + Select + MSO 16 + 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1) Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T2-T3)	20	99	94	100	100
6. Nortron (PRE) 96 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3)	8	100	85	100	100
7. Nortron (PRE) 120 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3)	10	100	93	100	100
8. Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3) + Dual Magnum at 29 fl oz (T3)	11	97	77	100	99
9. Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3) + Outlook at 21 fl oz (T3)	10	97	77	100	99
LSD (0.05)	3	4	9	NS	9

¹Methylated seed oil from Loveland

²T1 = first POST application ; T2 = second POST; etc.

³Sugb = Sugarbeet; Colq = common lambsquarters; Rrpw = redroot pigweed; Yeft = yellow foxtail; Wipm = wild proso millet.

Table 3. Continued.

Treatment Rate	2 loc Kochia cntl	Crook Yeft cntl	Mooreton Wipm cntl	St. Thomas		Approximate broadcast treatment cost
				Sugb inj	Extractable sucrose	
fl oz or oz/A	%	%	%	%	lb/A	\$/A
1. Progress + UpBeet + Stinger + Select + MSO ¹ 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3) ²	26	95	50	20	5580	64
2. Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T4)	46	100	99	26	5660	86
3. Dual Magnum (PRE) 32 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3)	41	100	49	38	4650	89
4. Dual Magnum (PPI) 32 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3)	36	100	58	53	3650	89
5. Dual Magnum (PPI) 16 followed by Dual Mag + Progress + UpBeet + Stinger + Select + MSO 16 + 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1) Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T2-T3)	42	100	68	44	3200	89
6. Nortron (PRE) 96 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3)	57	98	75	28	5220	143
7. Nortron (PRE) 120 followed by Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3)	67	98	58	33	5180	162
8. Progress + UPBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3) + Dual Magnum at 29 fl oz (T3)	47	100	69	29	4470	87
9. Progress + UpBeet + Stinger + Select + MSO 5.7 + 0.125 + 1.3 + 2 + 1.5% (T1-T3) + Outlook at 21 fl oz (T3)	52	100	91	24	5270	86
LSD (0.05)	9	2	24	5	700	

¹Methylated seed oil from Loveland²T1 = first POST application ; T2 = second POST; etc.³Sugb = Sugarbeet; Colq = common lambsquarters; Rrpw = redroot pigweed; Yeft = yellow foxtail; Wipm = wild proso millet.