

Lay-By Outlook Plus Other Herbicides and Fungicides, 2002
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LAY-BY OUTLOOK PLUS OTHER HERBICIDES AND FUNGICIDES, 2002.

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A Section 18 registration for Outlook was granted in 2002 for application to sugarbeet after the sugarbeet plants had two fully expanded true leaves. New fungicides Headline, Eminent, Quadris and GEM are registered for sugarbeet or may be registered for the 2003 growing season. Some progress is being made on obtaining a registration for Dual on sugarbeet but no one should plan on using Dual until a hard copy of the label is seen. The objective of these experiments was to investigate the influence of combinations of new and old herbicides and combinations of herbicides and fungicides on weed control and sugarbeet injury.

The conditions at planting and when pesticides were applied are given in [Tables 1 and 2](#). Pesticides were applied in 17 gpa water at 40 psi through 8002 nozzles to the center four rows of six-row plots. Sugarbeet injury and weed control were evaluated visually on July 1 and 19 at Crookston; June 26 and July 18 at Fargo; July 6 at St. Thomas; July 5 and August 14 at Belgrade; July 9 and August 16 at Raymond; and July 8 and August 13 at Buffalo Lake. Roundup Ready sugarbeet at St. Thomas was broadcast treated with Roundup UltraMax at 3 pt/a on June 20 to control all weeds and eliminate weed competition as an influence on sugarbeet yield. Plots at St. Thomas were harvested October 2. Plots at Belgrade and Raymond were not hand weeded so yield was influenced both by competition from surviving weeds and sugarbeet injury from the herbicide treatments. Belgrade was harvested September 10 and Raymond on September 12.

Betamix + UpBeet + Stinger + Poast + Scoil at the micro-rate applied three times gave 7% sugarbeet injury and 74% redroot pigweed control ([Table 3](#)). When Outlook at 21 fl oz/A was included with the second of three micro-rate applications, sugarbeet injury increased from 7 to 16% and redroot pigweed control increased from 74 to 97%. When Outlook at 21 fl oz/A was included with the third of three micro-rate applications, sugarbeet injury was 13% and redroot pigweed control was 94%. Outlook applied at 7 fl oz/A in all three micro-rate applications gave more sugarbeet injury and tended to give less redroot pigweed control than Outlook applied once at 21 fl oz/A in the third micro-rate application. Sugarbeet injury was increased with no improvement in redroot pigweed control when Headline, Quadris or GEM fungicides were included with the micro-rate + Outlook in the third of three micro-rate applications.

Outlook + Select or Outlook + Select + Scoil gave very little sugarbeet injury and poor control of redroot pigweed ([Table 3](#)). The micro-rate plus Outlook in the second of three applications gave sugarbeet injury similar to the micro-rate without Stinger plus Outlook in the second of three applications. The interaction between Stinger and Outlook apparently was not causing the observed increase in sugarbeet injury. When Outlook was applied separately from the micro-rate, sugarbeet injury and redroot pigweed control were similar to results when the Outlook was tank-mixed with the micro-rate.

The micro-rate applied three times plus Outlook in the third application gave sugarbeet injury and redroot pigweed control similar to the micro-rate applied four times ([Table 3](#)). Sugarbeet at St. Thomas apparently recovered from the observed injury since sugarbeet yield did not differ significantly among treatments. Plots at St. Thomas were seeded to Roundup Ready sugarbeet and were treated with Roundup Ultramax to control all weeds so weed competition was not a yield influencing factor at St. Thomas.

Betamix applied four times at 16/20/20/24 fl oz/A gave better control of *Amaranthus* spp. and similar control of common lambsquarters as compared to Betamix + Stinger + UpBeet + MSO applied four times at the micro-rate ([Table 4](#)). Increasing the Betamix rate from 8 to 12 fl oz/A in the third and fourth micro-rate application resulted in improved control of *Amaranthus* spp. Adding Outlook to the micro-rate generally improved *Amaranthus* spp. control and increased sugarbeet injury. Dual as a lay-by treatment in the second of three micro-rate applications gave sugarbeet injury and weed control similar to Outlook as a lay-by treatment in the second of three micro-rate applications. Outlook lay-by in the third of four micro-rate applications resulted in similar sugarbeet injury and

weed control as compared to the same herbicide treatments but with no oil adjuvant when the Outlook was included. Eliminating the oil adjuvant did not safen the treatment.

The micro-rate applied four times with Outlook in the second application gave better control of *Amaranthus* spp. than preplant incorporated (PPI) Dual followed by three applications of the micro-rate or PPI Nortron followed by Betamix twice at 16/20 fl oz/A (Table 4). Three treatments gave less than 80% control of *Amaranthus* spp. and common lambsquarters: PPI Nortron at 6 or 7 pt/A followed by Betamix + Stinger + UpBeet + MSO at the micro-rate and Betamix applied twice at 16/20 fl oz/A plus Betamix + Outlook applied twice at 16 + 12/16 + 9 fl oz.

Sugarbeet yield from plots treated with twelve of the tested herbicide combinations yielded less than the hand weeded plots (Table 4). This yield reduction could have been due to increased weed competition or increased sugarbeet injury from the herbicides. However, observed yields did not appear to relate well to sugarbeet injury or weed control as visually evaluated and reported. The treatment with the highest yield (not significantly greater than six other treatments) was PPI Eptam + Ro-Neet followed by the micro-rate applied three times. This treatment caused only 8% sugarbeet injury but control of *Amaranthus* spp. and common lambsquarters was not outstanding compared to other treatments.

Conclusions from these experiments include the following:

1. Lay-by Outlook improved control of *Amaranthus* spp. but also increased sugarbeet injury.
2. Adding Headline, Quadris or GEM fungicides to the micro-rate plus Outlook resulted in increased sugarbeet injury.
3. Sugarbeet injury from the Outlook combination treatments was not significantly reduced by removing the oil adjuvant, removing Stinger or by applying the Outlook separately from other postemergence treatments.
4. Split applying the Outlook in two or three parts did not improve weed control and sometimes increased sugarbeet injury as compared to applying the Outlook as one full-rate treatment.

Table 1. Conditions when Outlook and other pesticides were applied at Crookston, Fargo and St. Thomas, 2002.

CROOKSTON					
Date	May 14	June 3	June 12	June 18	June 24
Time of day	1:30 P	1:15 P	9:30 A	11:00 A	3:00 P
Air temp (F)	64	60	62	72	86
Relative humidity (%)	28	34	52	52	40
6-inch soil temp (F)	47	55	61	61	80
Soil moisture	good	fair	good	good	good
Sugarbeet (Crystal 999)	-	cot-2 lf	4 lf	4-6 lf	6-8 lf
Redroot pigweed	-	cot-1 lf	2-8 lf	2 lf-1.5 inch	2-5 inch
Counter 15G applied MIF at planting					
FARGO					
Date	April 26	May 21	May 28	June 4	June 12
Time of day	1:00 P	10:30 A	11:30 A	9:30 A	5:00 P
Air temp (F)	44	66	76	63	70
Relative humidity (%)	9	19	40	37	35
6-inch soil temp (F)	33	48	60	57	67
Soil moisture	good	good	good	good	good
Sugarbeet (Beta 2088)	-	cotyl	cot-2 lf	2-4 lf	4-6 lf
Redroot pigweed	-	cotyl	cot-1 lf	cot-2 lf	2 lf-1 inch

(continued)

Table 1 (cont). Conditions when Outlook and other pesticides were applied at Crookston, Fargo and St. Thomas, 2002.

ST. THOMAS					
Date	May 2	May 29	June 6	June 14	June 28
Time of day	7:30 P	10:00 A	10:30 A	11:00 A	11:00 A
Air temp (F)	48	75	70	66	78
Relative humidity (%)	22	51	36	52	50
6-inch soil temp (F)	52	58	60	57	72
Soil moisture	good	fair	good	good	good
Sugarbeet (H. Horizon RR)	-	cotyl	2-4 lf	4-6 lf	6-10 lf
Counter 15G applied MIF at planting					
Roundup at 3 pt/a applied June 20 broadcast					
Lorsban 4E at 1 qt/A applied June 28 broadcast					
Harvested October 2					

Table 2. Conditions at application for Outlook, and other herbicides at Belgrade, Raymond and Buffalo Lake, 2002.

BELGRADE						
Date	April 29	May 17	May 24	May 31	June 7	
Time of day	noon	2:00 P	2:30 P	3:30 P	5:00 P	
Air temp (F)	45	50	71	81	84	
Sugarbeet (ACH 999)	-	cotyl	cot-2 lf	2-4 lf	4-6 lf	
Amaranthus spp.	-	cotyl	cot-0.5 inch	cot-1.5 inch	cot-3 inch	
Common lambsquarters	-	coty	cot-0.5 inch	cot-1.5 inch	cot-3 inch	
	PPI applied					
	seeded					
RAYMOND						
Date	May 2	May 9	May 27	June 4	June 11	June 18
Time of day	11:00 A		noon	4:00 P	7:30 P	5:00 P
Air temp (F)	50		82	78	82	89
Sugarbeet (Beta 4930)	-		cotyl	cot-2 lf	2-4 lf	4-6 lf
Amaranthus spp.	-		cotyl	cot-0.5 inch	cot-1.5 inch	cot-3 inch
Common lambsquarters	-		cotyl	cot-0.5 inch	cot-1.5 inch	cot-3 inch
	PPI applied	seeded				
BUFFALO LAKE						
Date	April 30	May 3	May 23	May 30	June 6	June 14
Time of day	1:15 P		2:15 P	11:00 A	3:30 P	5:15 P
Air temp (F)	40		78	85	83	86
Sugarbeet (Beta 4600)	-		cotyl	cot-2 lf	2-4 lf	4-6 lf
Amaranthus spp.	-		cotyl	cot-0.5 inch	cot-1.5 inch	cot-3 inch
Common lambsquarters	-		cotyl	cot-0.5 inch	cot-1.5 inch	cot-3 inch
	PPI applied	seeded				

Table 3. Lay-by Outlook plus postemergence herbicides and fungicides at Crookston, Fargo and St. Thomas, 2002. (Dexter and Luecke)

Treatment	Rate	3 loc Sugb inj	Fgo Crook Rrpw cntl	St. Thom. ² Extrac. sucrose
	fl oz or oz/A	%	%	lb/a
Betamix + UpBeet + Stinger + Poast + Scoil (T ¹ -T ⁴) 8 + 0.125 + 1.3 + 5.1 + 1.5%		12	93	5510
Betamix + UpBeet + Stinger + Poast + Scoil (T1-T3) 8 + 0.125 + 1.3 + 5.1 + 1.5%		7	74	5050
Betamix + UpBeet + Stinger + Poast + Scoil (T1-T3) 8 + 0.125 + 1.3 + 5.1 + 1.5% + Outlook at 21 (T2)		16	97	5680
Betamix + UpBeet + Stinger + Poast + Scoil (T1-T3) 8 + 0.125 + 1.3 + 5.1 + 1.5% + Outlook at 21 (T3)		13	94	5780
Betamix + UpBeet + Stinger + Poast + Scoil (T1, T3) 8 + 0.125 + 1.3 + 5.1 + 1.5%		11	89	5520
Betamix + UpBeet + Stinger + Passt + Outlook (no oil, T2) 8 + 0.125 + 1.5 + 5.1 + 21				
Betamix + UpBeet + Stinger + Poast + Scoil (T1-T3) 8 + 0.125 + 1.3 + 5.1 + 1.5% + Outlook at 6 (T2) and at 15 (T3)		14	93	5260
Betamix + UpBeet + Stinger + Poast + Scoil + Outlook (T1-T3) 8 + 0.125 + 1.3 + 5.1 + 1.5% + 7		21	87	5360
Betamix + UpBeet + Stinger + Poast + Scoil (T1-T3) 8 + 0.125 + 1.3 + 5.1 + 1.5% + Outlook at 21 + Headline at 9 (T3)		24	82	6190
Betamix + UpBeet + Stinger + Poast + Scoil (T1-T3) 8 + 0.125 + 1.3 + 5.1 + 1.5% + Outlook at 21 + Eminent at 12.8 (T3)		13	87	5380
Betamix + UpBeet + Stinger + Poast + Scoil (T1-T3) 8 + 0.125 + 1.3 + 5.1 + 1.5% + Outlook at 21 + Quadris at 9 (T3)		45	91	5210
Betamix + UpBeet + Stinger + Poast + Scoil (T1, T3) 8 + 0.125 + 1.3 + 5.1 + 1.5% + Outlook at 21 + GEM at 7 (T3)		30	90	5290
Betamix + UpBeet + Stinger + Poast + Scoil (T1, T2) 8 + 0.125 + 1.3 + 5.1 + 1.5% Outlook at 21 (T3)		6	74	4880
Outlook + Select (T2) 21 + 6		3	47	5160
Outlook + Select + Scoil (T2) 21 + 6 + 1.5%		5	44	5170
Betamix + UpBeet + Poast + Scoil (T1-T3) 8 + 0.125 + 5.1 + 1.5% + Outlook at 21 (T2)		17	84	5280
Betamix + UpBeet + Stinger + Poast + Scoil (T1-T4) 8 + 0.125 + 5.1 + 1.5% + Outlook at 21 (T3)		17	98	5070
Betamix + UpBeet + Stinger + Poast + Scoil (T1-T3) 8 + 0.125 + 5.1 + 1.5% Outlook at 21 not tank mixed (T2)		13	90	4670
Hand weeded		-	-	5510
	LSD (0.05)	7	14	NS

¹T1 = first application, T2 = second application, etc.

² Roundup was broadcast over the Roundup Ready sugarbeet at St. Thomas to eliminate weed competition.

Table 4. Outlook, Dual and other herbicides at Belgrade, Raymond and Buffalo Lake, 2002. (Bredehoeft)

Treatment	Rate	3 loc Sugb inj	3 loc Amaranthus ² spp. cntl	3 loc Colq cntl	Belgrade Raymond Extrac. sucrose ⁴
	fl oz or oz/A	%	%	%	lb/a
Hand weeded		0	99	99	5040
Betamix (T1-T4)	16/20/20/24	3	75	89	3360
Betamix + Stinger + UpBeet + MSO ¹ (T1-T4) 8 + 1.25 + 0.125 + 2%		5	61	87	3120
Betamix + Stinger + UpBeet + MSO (T1-T4) 8 + 1.25 + 0.125 + 2% (T1, T2) 12 + 1.25 + 0.125 + 2% (T3, T4)		6	73	91	3960
Betamix + Stinger + UpBeet + MSO + Nortron (T1, T2) 8 + 1.25 + 0.125 + 2% + 4		5	70	87	3040
Betamix + Stinger + UpBeet + MSO (T3, T4) 8 + 1.25 + 0.125 + 2%					
Betamix + Stinger + UpBeet + MSO (T1-T4) 8 + 1.25 + 0.125 + 2% Outlook between T2 and T3 21		16	86	94	3730
Betamix + Stinger + UpBeet + MSO (T1, T3, T4) 8 + 1.25 + 0.125 + 2%		16	85	89	3340
Betamix + Stinger + UpBeet + MSO + Outlook (T2) 8 + 1.25 + 0.125 + 2% + 21					
Betamix + Stinger + UpBeet + MSO (T1, T2, T4) 8 + 1.25 + 0.125 + 2%		11	81	91	3730
Betamix + Stinger + UpBeet + MSO + Outlook (T3) 8 + 1.25 + 0.125 + 2% + 21					
Betamix + Stinger + UpBeet + MSO (T1, T4) 8 + 1.25 + 0.125 + 2%		9	84	91	4480
Betamix + Stinger + UpBeet + MSO + Outlook (T2, T3) 8 + 1.25 + 0.125 + 2% + 12 (T2), 9 (T3)					
Betamix + Stinger + UpBeet + MSO (T1, T3) 8 + 1.25 + 0.125 + 2%		20	72	86	3750
Betamix + Stinger + UpBeet + MSO + Outlook (T2) 8 + 1.25 + 0.125 + 2% + 21					
Betamix + Stinger + UpBeet + MSO (T1) 8 + 1.25 + 0.125 + 2%		7	80	87	4320
Betamix + Stinger + UpBeet + MSO + Outlook (T2, T3) 8 + 1.25 + 0.125 + 2% + 12 (T2), 9 (T3)					
Betamix + Stinger + UpBeet + MSO (T1, T3, T4) 8 + 1.25 + 0.125 + 2%		14	87	91	3400
Betamix + Stinger + UpBeet + Outlook, no oil (T2) 8 + 1.25 + 0.125 + 21					
Betamix + Stinger + UpBeet + MSO (T1, T4) 8 + 1.25 + 0.125 + 2%		13	88	94	4140
Betamix + Stinger + UpBeet + Outlook, no oil (T2, T3) 8 + 1.25 + 0.125 + 21					
Dual (PPI) 2 pt		6	70	85	4460
Betamix + Stinger + UpBeet + MSO (T1, T2, T3) 8 + 1.25 + 0.125 + 2%					
Betamix + Stinger + UpBeet + MSO (T1, T3) 8 + 1.25 + 0.125 + 2%		23	74	82	3090
Batamix + Stinger + UpBeet + MSO + Dual (T2) 8 + 1.25 + 0.125 + 2% + 2 pt					
Nortron (PPI) 6 pt		9	60	75	3230
Betamix + Stinger + UpBeet + MSO (T1, T2) 8 + 1.25 + 0.125 + 2%					

(continued)

Table 4 (cont). Outlook, Dual and other herbicides at Belgrade, Raymond and Buffalo Lake, 2002. (Bredehoeft)

Treatment	Rate	3 loc Sugb inj	3 loc Amaranthus ² spp. cntl	3 loc Colq cntl	Belgrade Raymond Extrac. sucrose ⁴
	fl oz or oz/A	%	%	%	lb/a
Nortron (PPI) 7 pt Betamix + Stinger + UpBeet + MSO (T1, T2) 8 + 1.25 + 0.125 + 2%		8	72	79	4630
Dual (PPI) 2 pt Betamix (T1, T2) 16/20 Outlook (T3) 21		9	83	75	3650
Eptam + Ro-Neet (PPI) 2+2 Betamix + Stinger + UpBeet + MSO (T1, T2, T3) 8 + 1.25 + 0.125 + 2%		8	75	81	5220
Nortron (PPI) 6 pt Betamix (T1, T2) 16/20		6	68	82	4970
Betamix (T1, T4) 16/20 Betamix + Outlook (T2, T3) 16 + 12/16 + 9		6	68	74	4110
	LSD (0.05)	9	10	9	1000

¹MSO = methylated seed oil adjuvant

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

³Amaranthus spp = mixture of pigweed species.

⁴Herbicide treated plots were not hand weeded.