Application Timing and Tank-mix Partners with Roundup Over-The-Top of Roundup Ready® Sugarbeets in 2007.

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A field study was initiated near Scottsbluff, Nebraska to compare the effectiveness of various herbicides for weed control in Roundup Ready sugarbeets. The experimental design was a randomized complete block with four replications. Plots were 11 feet wide by 40 feet long and were located on a sandy loam soil with a pH of 8.2 and organic matter content of 1.4%. Sugarbeet, 'BTS-RZ03RR07', were planted on April 26. The plot area was irrigated on May 10, May 25, June 8, and June 18 for seed germination and early season plant growth. Postemergence herbicide application began on May 15 when sugarbeets were in the cotyledon growth stage. Sugarbeets were planted in 22-inch spaced rows and row closure occurred on June 18. Herbicides were applied with a tractor-mounted sprayer calibrated to deliver 20 gallons of water per acre at 36-psi pressure with Spraying Systems 11002 VS nozzles. Environmental conditions, rainfall following herbicide application, and weed growth stages at the time of herbicide application are given in Table 1.

Crop injury from herbicides was evaluated on May 22, June 6, and June 12 (Table 2). Crop stand and weed density were determined by counting sugarbeet and weed seedlings in the entire plot on June 26. The weed population consisted of redroot pigweed, common lambsquarters, common cocklebur, hairy nightshade, and velvetleaf at densities of 15, 404, 6, 65, and 2 plants per 92 square feet, respectively. Temporary sugarbeet injury was evident on plants treated with elevated rates of Mon 79790. Nortron applied PRE caused early season stunting to sugarbeets while Nortron applied at the 6 true-leaf growth stage caused later season leaf crinkling and stunting. Moderate crop injury was also evident from POST treatment with Progress plus Upbeet plus Stinger. Even though weed populations were severe, all the herbicide treatments provided 95% or greater average weed control. Sugarbeet root yields averaged 36.5 tons per acre with the conventional POST treatment and 40.3 tons per acre with three POST treatments with Roundup Original Max at 0.75 lb/acre.

Table 1. Environmental Conditions at the Time of Herbicide Application.

Date	Air temperature	Humidity	Wind speed & direction	Time of day	Sugarbeet growth stage	Weed heights				
						Colq	Hans	Rrpw	Cocb	Vele
	(F)	(%)	(mph)			- - - - - - - - (inches) - - - - - - - -				
April 27	50	65	11 NW	9:00 am	PRE	no growth				
May 15	57	45	8 NW	10:00 am	Cot	1.5	1	1.5	2	2
May 18	61	63	1 SE	9:00 am	2 TL	1.75	1.5	1.75	3	2.5
May 24	45	65	5 NW	8:00 am	4 TL	1.75	1.75	1.75	3	2.75
May 30	59	51	15 NW	10:00 am	6 TL	4	2.5	2.5	4.5	2.5
June 13	66	60	5 NW	9:00 am	10 TL	10	4	5	14	12
June 18	73	28	4 SE	9:00 am	Canopy closure	12	8	12	15	20

Rainfall before and after herbicide application:

Date	Amount
	- (inches) -
April 24	0.30
April 26	0.04
May 3	0.26
May 5	0.29
May 10	0.50

Date	Amount
	- (inches) -
May 21	0.23
May 25	0.75
May 29	0.23
June 7	0.08
June 8	0.75

Date	Amount
	- (inches) -
June 12	0.08
June 13	0.85
June 16	0.05
June 18	0.85

Table 2. Application Timing and Tank-Mix Partners with Roundup Over-the-Top of Roundup Ready Sugarbeets.

Herbicide treatment [1]	Rate	Time of application [2]	Sugarbeet													
			Visual injury [3]			Stand	Root Yield			Percent weed control 6/26 [4]					
			5/22	6/6	6/12	6/26	10/8	Sucrose	SLM	Colq	Hans	Rrpw	Cocb	Vele	Avg
	(lb/acre)		----- (%) -----			(plants/acre)	(tons/acre)	(%)		---------- (%) ----------					
Nontreated	—	—	0	0	0	46900	—	—	—	0	0	0	0	0	0
Roundup Original Max + AMS	0.75	2 TL													
Roundup Original Max + AMS	0.75	6 TL													
Roundup Original Max + AMS	0.75	Canopy Closure	0	0	0	51100	40.3	12.7	2.2	98	99	99	99	99	99
Roundup Original Max + AMS + X77	0.75	2 TL													
Roundup Original Max + AMS + X77	0.75	6 TL													
Roundup Original Max + AMS + X77	0.75	Canopy Closure	0	0	0	51200	37.6	12.8	2.1	99	99	99	99	99	99
Mon 79790 + AMS	1.5	2 TL													
Mon 79790 + AMS	2.25	6 TL													
Mon 79790 + AMS	1.5	10 TL													
Mon 79790 + AMS	1.5	Canopy Closure	5	3	3	52000	38.4	13.0	2.0	99	99	99	99	99	99
Roundup Original Max + Outlook + AMS	0.75 + 0.84	2 TL													
Roundup Original Max + AMS	0.75	6 TL													
Roundup Original Max + AMS	0.75	Canopy Closure	3	3	3	48500	41.5	12.8	2.0	99	99	99	99	99	99
Roundup Original Max + AMS	0.75	2 TL													
Roundup Original Max + Outlook + AMS	0.75 + 0.84	6 TL													
Roundup Original Max + AMS	0.75	Canopy Closure	0	0	0	51300	42.3	12.6	2.1	99	99	99	99	99	99
Roundup Original Max + Stinger + AMS	0.75 + 0.093	2 TL													
Roundup Original Max + AMS	0.75	6 TL													
Roundup Original Max + AMS	0.75	Canopy Closure	2	0	0	52200	37.6	12.8	2.1	99	99	99	99	99	99
Roundup Original Max + Select + AMS	0.75 + 0.125	2 TL													
Roundup Original Max + AMS	0.75	6 TL													
Roundup Original Max	0.75	Canopy Closure	0	3	0	48800	38.8	12.9	2.2	99	99	99	99	99	99
Nortron	1.0	PRE													
Roundup Original Max + AMS	0.75	2 TL													
Roundup Original Max + AMS	0.75	6 TL													
Roundup Original Max + AMS	0.75	Canopy Closure	12	4	2	45400	40.1	12.1	2.1	95	99	99	99	87	96
Roundup Original Max + AMS	0.75	2 TL													
Roundup Original Max + Nortron + AMS	0.75 + 1.125	6 TL													
Roundup Original Max + AMS	0.75	Canopy Closure	3	8	11	51300	36.9	12.4	2.1	99	99	99	99	99	99

Herbicide treatment [1]	Rate	Time of application [2]	Sugarbeet							Percent weed control 6/26 [4]					
			Visual injury [3]			Stand	Root Yield								
			5/22	6/6	6/12	6/26	10/8	Sucrose	SLM	Colq	Hans	Rrpw	Cocb	Vele	Avg
	(lb/acre)		- - - - - (%) - - - - -			(plants/acre)	(tons/acre)	(%)		- - - - - - - - - - - - - - - (%) - - - - - - - - - - - - - - -					
Nortron	1.0	PRE													
Roundup Original Max + AMS	0.75	2 TL													
Roundup Original Max + Nortron + AMS	0.75 + 1.0	6 TL													
Roundup Original Max + AMS	0.75	Canopy Closure	11	8	11	49100	37.7	12.6	2.2	99	99	99	99	99	99
Progress + Upbeet + Stinger + Scoil	0.08 + 0.004 + 0.03	Cot													
Progress + Upbeet + Stinger + Scoil	0.08 + 0.004 + 0.03	2 TL													
Progress + Upbeet + Stinger + Scoil	0.08 + 0.004 + 0.03	4 TL													
Progress + Upbeet + Stinger + Scoil	0.08 + 0.004 + 0.03	6 TL	15	14	8	53200	36.5	13.0	2.1	87	99	93	99	99	95
Touchdown HiTech + AMS	0.75	2 TL													
Sequence + AMS	1.64	6 TL													
Touchdown HiTech + AMS	0.75	Canopy Closure	1	8	4	50300	39.7	12.5	2.1	99	98	99	99	99	99
Touchdown HiTech + AMS	0.75	2 TL													
Sequence + AMS	1.64	6 TL													
Sequence + AMS	1.64	Canopy Closure	1	5	3	53600	43.3	12.5	2.0	99	99	99	99	99	99
Touchdown HiTech + AMS	0.75	2 TL													
Touchdown HiTech + AMS	0.75	6 TL													
Sequence + AMS	1.64	Canopy Closure	0	0	1	52000	36.5	12.6	2.1	99	99	99	99	87	97
LSD at 5%	—	—	4	6	5	NS	5.6	0.8	0.2	4	1	2	NS	12	3

[1] Spray additives were combined with the spray solution at the following rate: ammonium sulfate (AMS) at 2%, surfactant X77 at 0.25% v/v, and methylated seed oil (Scoil) at 1.5% v/v.

[2] Time of application: preemergence (PRE), sugarbeet growth stage, cotyledon (Cot), 2 true-leaves (2 TL), 4- true-leaves (4 TL), 6 true-leaves (6 TL), and canopy closure of sugarbeet.

[3] Visual crop injury evaluated on a scale from 0 to 100 with 0 equal to no injury and 100 equal to death of the plant.

[4] Percent weed control calculated from weed counts taken on June 26. Weed abbreviations: common lambsquarters (Colq), hairy nightshade (Hans), redroot pigweed (Rrpw), common cocklebur (Cocb), and velvetleaf (Vele).