Influence of Preplant Application of Nortron on the Timing of Weed Removal in Roundup-Ready Sugarbeets at Scottsbluff, Nebraska during the 2009 Growing Season.

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A field study was initiated near Scottsbluff, Nebraska to examine the effect of a preemergence application of Nortron at planting on early season weed competition in sugarbeets. The experimental design was a randomized complete block with four replications. Plots were 11 feet wide by 50 feet long and were located on a sandy loam soil with 0.9% organic matter and a pH of 8.3. Sugarbeet 'BTS66RR70' were planted on April 24 and irrigated on April 30, May 8, and May 15 to enhance sugarbeet seed germination and incorporation of Nortron applied to selected plots on April 27. Weeds were killed with Roundup Power Max after they had grown with sugarbeets for different time intervals. After the initial application of Roundup was applied two additional Roundup applications were made at 2 week intervals to ensure weeds were suppressed. Weed removal occurred at either the cotyledon, 2, 4, 6, 8, 10, 12, and 14 true-leaf growth stages. Roundup Power Max plus ammonium sulfate at 17 lbs/100 gallons of water was applied with a tractor-mounted sprayer calibrated to deliver 20 gallons of water per acre at 32-psi pressure with Spraying Systems 11002 VS nozzles. Environmental conditions and weed growth stages at the time of initial herbicide application are given in Table 1. The weed population at the study site was severe and consisted of common lambsquarters, wild buckwheat, hairy nightshade, and redroot pigweed at densities of 1064, 2, 37, and 52 plants per 92 sq ft, respectively (Table 2). Common lambsquarters was the dominate weed in the study area but even though the weed reached 46 inches in height at later removal timings Roundup still provided excellent control after three herbicide applications. Allowing weeds to reach this advanced height did cause shading of the sugarbeet plant and reductions in root yield. Root yields were excellent and averaged 36.3 tons/acre in plots where weeds were not allowed to compete with sugarbeets (removal at the cotyledon or two true-leaf growth stage).

There was a significant reduction in sugarbeet root yield when weed removal was delayed until the 12 true-leaf growth stage (Figure 1, Table 2). By applying a planting time application of Nortron there was not a significant reduction in sugarbeet root yield until the 14 true-leaf growth stage. Nortron provided early season weed suppression that reduced early season sugarbeet weed competition. Average sugarbeet root yield when only Roundup Power Max was applied at the 12 true-leaf growth stage was 27.6 tons/acre, a 8.5 ton reduction from the 36.3 tons/acre achieved when weeds were removed at the cotyledon or two true-leaf growth stage. By using Nortron at planting and applying Roundup Power Max at the 12 true-leaf growth stage sugarbeet yield was 32.4 tons/acre, therefore Nortron provided enough early season weed control to reduce the early season effect of weeds on sugarbeet yield to 3.9 tons/acre. A similar trend was observed at the 14 true-leaf removal timing; removing weeds with Roundup Power Max alone resulted in a root yield of 21.4 tons/acre while utilizing Nortron at planting followed by Roundup Power Max resulted in a root yield of 30.7 tons/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 height			
						Colq	Wibw	Hans	Rrpw
	(F)	(%)	(mph)			---------- (inches) ----------			
April 27	46	47	2 E	1:30 PM	PRE	No growth			
May 18	83	22	2 W	11:00 AM	Cot	.75	--	.50	--
May 22	74	47	3 SE	2:00 PM	2 TL	2	1.5	1.5	0.5
June 1	76	41	1 SE	1:30 PM	4 TL	4	2	4	1.5
June 8	62	55	3 SE	2:30 PM	6 TL	11	6	4	3.5
June 15	79	33	5 W	1:00 PM	8 TL	14	10	7	6
June 22	83	37	2 SE	11:00 AM	10 TL	24	10	9	10
July 1	73	55	4 SE	9:00 AM	12 TL	30	10	10	24
July 7	67	70	1 NW	9:00 AM	14 TL	46	12	24	35
July 13	79	55	2 SE	10:00 AM		62	13	24	41
July 20	69	63	4 NW	8:30 AM		66	14	26	48
July 27	70	62	1 NE	9:00 AM		66	15	30	50
August 3	63	68	2 NW	8:30 AM		68	18	32	52

Table 2. Influence of Preplant Application of Nortron on the Timing of Weed Removal in Roundup-Ready Sugarbeets at Scottsbluff, Nebraska during the 2009 Growing Season.

			Sugarbeet				Weed density August 21				
Herbicide treatment[1]	Rate	Time of application[2]	Stand 5/28	Root yield	Sucrose	SLM	Common lambsquarters	Wild buckwheat	Hairy nightshade	Redroot pigweed	Total
	(lb/acre)		(plants/acre)	(tons/acre)	(%)		---------- plants/92 sq ft ----------				
Nontreated	--	--	39190				1064	2	37	52	1156
Roundup Power Max	0.75	Cot	44770	36.5	14.0	2.1	1	0	0	0	1
Roundup Power Max	0.75	2 TL	45130	34.9	14.3	1.9	6	0	1	0	6
Roundup Power Max	0.75	4 TL	42510	36.9	14.2	2.1	1	0	0	0	1
Roundup Power Max	0.75	6 TL	42870	35.4	14.8	1.9	18	0	0	0	18
Roundup Power Max	0.75	8 TL	43700	32.3	14.4	2.0	4	0	0	0	4
Roundup Power Max	0.75	10 TL	43230	34.8	14.2	1.9	2	0	0	0	2
Roundup Power Max	0.75	12 TL	39070	28.2	13.9	2.0	14	0	0	0	14
Roundup Power Max	0.75	14 TL	44410	20.2	13.6	1.9	21	4	1	0	26
Nortron/Roundup Power Max	1.0/0.75	PRE/Cot	44060	35.4	14.0	2.1	2	0	2	0	4
Nortron/Roundup Power Max	1.0/0.75	PRE/2 TL	45960	36.0	13.8	2.0	18	3	0	0	21
Nortron/Roundup Power Max	1.0/0.75	PRE/4 TL	44770	37.1	14.2	2.0	2	0	0	0	2
Nortron/Roundup Power Max	1.0/0.75	PRE/6 TL	42390	35.8	14.1	2.0	8	0	1	0	9
Nortron/Roundup Power Max	1.0/0.75	PRE/8 TL	43580	35.4	13.8	2.1	6	1	0	0	7
Nortron/Roundup Power Max	1.0/0.75	PRE/10 TL	44290	35.3	13.2	2.0	12	0	1	0	13
Nortron/Roundup Power Max	1.0/0.75	PRE/12 TL	43940	35.4	13.7	2.1	12	0	1	0	13
Nortron/Roundup Power Max	1.0/0.75	PRE/14 TL	44410	34.3	13.1	2.0	14	0	0	0	14
Roundup Power Max	1.12	Cot	46080	39.4	13.6	2.0	4	0	0	1	5
Roundup Power Max	1.12	2 TL	46310	37.6	14.0	2.0	7	1	0	0	8
Roundup Power Max	1.12	4 TL	38950	34.7	14.0	1.9	2	0	0	0	2
Roundup Power Max	1.12	6 TL	43460	37.6	13.8	1.9	13	0	0	0	13
Roundup Power Max	1.12	8 TL	43230	35.1	13.8	2.1	4	0	0	0	4
Roundup Power Max	1.12	10 TL	39070	32.9	13.6	2.1	10	0	1	0	11
Roundup Power Max	1.12	12 TL	37880	27.1	14.0	2.0	9	0	0	0	9
Roundup Power Max	1.12	14 TL	41330	22.6	13.9	2.1	12	0	0	0	12
Nortron/Roundup Power Max	1.0/1.12	Cot	44060	36.2	13.8	1.8	5	0	1	0	6
Nortron/Roundup Power Max	1.0/1.12	2 TL	45960	38.3	13.8	1.8	3	0	0	0	3
Nortron/Roundup Power Max	1.0/1.12	4 TL	45010	33.1	13.8	2.1	3	0	0	0	3
Nortron/Roundup Power Max	1.0/1.12	6 TL	40140	34.2	14.1	2.1	1	0	0	0	1
Nortron/Roundup Power Max	1.0/1.12	8 TL	42630	34.6	13.8	2.0	2	0	0	0	2
Nortron/Roundup Power Max	1.0/1.12	10 TL	42630	35.0	13.6	1.9	2	0	0	0	2
Nortron/Roundup Power Max	1.0/1.12	12 TL	43820	29.4	14.2	1.9	15	0	0	0	15
Nortron/Roundup Power Max	1.0/1.12	14 TL	44290	27.2	13.8	1.9	11	0	2	0	13
LSD at 0.05	--	--	5100	4.7	NS	NS	29	2	6	20	52

[1]Roundup Power Max was combined with ammonium sulfate (AMS) at 17 lb/100 gallons of spray solution. Each Roundup Power Max treatment was applied three times at 2 week intervals. Example, Roundup Power Max applied at the cotyledon growth stage (5/18) was repeated on 6/1 and 6/15.

[2]Time of application, preemergence (PRE), cotyledon (Cot), 2 true-leaves (2 TL), 4 true-leaves (4 TL), 6 true-leaves (6 TL), 8 true-leaves (8 TL), 10 true-leaves (10 TL), 12 true-leaves (12 TL), and 14 true-leaves (14 TL).

Figure 1. Influence of Weed Removal on Sugarbeet Root Yield.