

Influence of Different Adjuvants on the Performance of Herbicides in Sugarbeets.

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A field study was initiated near Mitchell, Nebraska to compare the effectiveness of various herbicides applied postemergence for selective weed control in sugarbeets. The experimental design was a randomized complete block with four replications. Plots were 11 feet wide by 25 feet long and were located on a loam soil with a pH of 7.8 and organic matter content of 1.1%. Sugarbeet 'BTS66R70' were planted on May 5 and irrigated on May 8 to enhance sugarbeet seed germination and early season crop vigor. Postemergence herbicide application began on May 27 when sugarbeet were in the two true-leaf growth stage. Herbicides were 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 at the time of herbicide application are given in Table 1. A hail storm occurred on June 10 and caused 75% defoliation of sugarbeets and weeds. Sugarbeets recovered and herbicide application resumed on June 23.

When compared to nontreated plots none of the herbicide treatments reduced sugarbeet stand (Table 2). Sugarbeet injury was evaluated on July 8 and none of the treatments resulted in crop injury greater than 7%. Betamix plus Upbeet plus Stinger in combination with Destiny or Destiny HC caused minor crop response. Weed density was moderate and consisted of redroot pigweed, toothed spurge, green foxtail, kochia, common lambsquarters, and hairy nightshade at densities of 23, 5, 2, 6, 125, and 91 plants per 137 sq ft, respectively. All herbicide treatments provided excellent weed control with and without various adjuvants.

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

Date	Air temperature (F)	Humidity (%)	Wind speed & direction (mph)	Time of day	Sugarbeet growth stage	Weed heights (inches)					
						Colq	Rrpw	Tosp	Grft	Kocz	Ruth
May 27	57	65	1 W	9:00 AM	2 true-leaves	2	0.5	1	0.5	1	1.5
June 4	61	59	2 NW	10:00 AM	4 true-leaves	3	1	2	1	2	3
June 23	73	62	4 NW	10:00 AM	6 true-leaves	5	4	3	2	4	4
July 2	68	71	6 NW	9:00 AM	8 true-leaves	7	5	5	3	5	5

Table 2. Influence of Different Adjuvants on the Performance of Herbicides in Sugarbeets.

Herbicide treatment ¹	Rate	Time of application ²	Sugarbeet		Weed density 7/20 ⁴						
			Injury ³	Stand	Rrpw	Tosp	Grft	Kocz	Colq	Hans	Total
			7/8	(plants/acre)	----- (plants/137 sq ft) -----						
	(lb/acre)		(%)								
Nontreated	--	--	0	30100	23	5	2	6	125	91	252
Betamix + Upbeet + Stinger + Destiny	0.16 + 0.008 + 0.04	2 TL									
Betamix + Upbeet + Stinger + Destiny	0.16 + 0.008 + 0.04	4 TL									
Betamix + Upbeet + Stinger + Destiny	0.16 + 0.008 + 0.04	6 TL	7	37400	0	1	2	0	1	1	5
Betamix + Upbeet + Stinger + Destiny HC	0.16 + 0.008 + 0.04	2 TL									
Betamix + Upbeet + Stinger + Destiny HC	0.16 + 0.008 + 0.04	4 TL									
Betamix + Upbeet + Stinger + Destiny HC	0.16 + 0.008 + 0.04	6 TL	7	34100	4	0	2	0	3	1	10
Cornerstone Plus + Class Act NG	0.75	4 TL									
Cornerstone Plus + Class Act NG	0.75	8 TL	2	33600	0	0	0	0	0	0	0
Cornerstone Plus + Stinger + Class Act NG	0.75 + 0.02	4 TL									
Cornerstone Plus + Stinger + Class Act NG	0.75 + 0.02	8 TL	3	35700	0	0	0	0	0	0	0
Cornerstone Plus + Stinger + Class Act NG + Interlock	0.75 + 0.02	4 TL									
Cornerstone Plus + Stinger + Class Act NG + Interlock	0.75 + 0.02	8 TL	4	33800	0	0	0	0	0	0	0
Cornerstone Plus + Upbeet + Class Act NG	0.75 + 0.016	4 TL									
Cornerstone Plus + Upbeet + Class Act NG	0.75 + 0.016	8 TL	5	38700	0	0	0	0	0	0	0
Cornerstone Plus + Upbeet + Class Act NG + Interlock	0.75 + 0.016	4 TL									
Cornerstone Plus + Upbeet + Class Act NG + Interlock	0.75 + 0.016	8 TL	3	34800	0	0	0	0	0	0	0
Cornerstone Plus + Upbeet + Class Act NG + Superb HC	0.75 + 0.016	4 TL									
Cornerstone Plus + Upbeet + Class Act NG + Superb HC	0.75 + 0.016	8 TL	5	32900	0	0	0	0	0	0	0
Cornerstone Plus + Upbeet + Class Act NG + Destiny HC	0.75 + 0.016	4 TL									
Cornerstone Plus + Upbeet + Class Act NG + Destiny HC	0.75 + 0.016	8 TL	0	37200	3	0	1	2	2	2	10
Cornerstone Plus + Upbeet + Class Act NG + Destiny HC + Interlock	0.75 + 0.016	4 TL									
Cornerstone Plus + Upbeet + Class Act NG + Destiny HC + Interlock	0.75 + 0.016	8 TL	0	36700	0	0	0	0	0	0	0
Cornerstone Plus + Clethodim + Class Act NG	0.75 + 0.063	4 TL									
Cornerstone Plus + Clethodim + Class Act NG	0.75 + 0.063	8 TL	3	35000	0	0	0	0	0	0	0
Cornerstone Plus + Clethodim + Class Act NG + Interlock	0.75 + 0.063	4 TL									
Cornerstone Plus + Clethodim + Class Act NG + Interlock	0.75 + 0.063	8 TL	3	32800	0	0	0	0	0	0	0
Cornerstone Plus + Clethodim + Class Act NG + Superb HC	0.75 + 0.063	4 TL									
Cornerstone Plus + Clethodim + Class Act NG + Superb HC	0.75 + 0.063	8 TL	0	35300	0	0	0	0	0	0	0
Cornerstone Plus + Clethodim + Class Act NG + Destiny HC	0.75 + 0.063	4 TL									
Cornerstone Plus + Clethodim + Class Act NG + Destiny HC	0.75 + 0.063	8 TL	5	34800	0	0	0	0	0	0	0
Cornerstone Plus + Clethodim + Class Act NG + Destiny HC + Interlock	0.75 + 0.063	4 TL									
Cornerstone Plus + Clethodim + Class Act NG + Destiny HC + Interlock	0.75 + 0.063	8 TL	2	36700	0	0	0	0	0	0	0
LSD at (0.05)	--	--	7	NS	1	0.5	0.5	0.3	0.5	1	5

¹Adjuvants were combined with herbicides at the following rate: Destiny at 1.5% v/v, Destiny HC at 1% v/v with Betamix and 0.5% with Cornerstone Plus, Class Act NG at 2.5% v/v, Interlock at 4 oz/acre, and Superb HC at 0.5% v/v.

²Time of application: two true-leaves (2 TL), four true-leaves (4 TL), six true-leaves (6 TL), and eight true-leaves (8 TL).

³Sugarbeet injury evaluated on a scale of 0 equal to no injury and 100 equal to death of the plant.

⁴Weed abbreviations: redroot pigweed (Rrpw), toothed spurge (Tosp), green foxtail (Grft), Kochia (Kocz), common lambsquarters (Colq), and hairy nightshade (Hans).