

EVALUATION OF PREEMERGENCE AND POSTEMERGENCE HERBICIDE APPLICATIONS ON SUGAR BEETS, 1998

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Abstract

Evaluation of preemergence and postemergence herbicide applications on sugar beets was conducted in two commercial fields near Prineville and Culver, Oregon. The most effective control of spring germinating annual weeds was provided by preemergence application of Nortron (ethofumesate), followed by Betamix (desmedipham + phenmedipham) plus Upbeet (triflusalfron methyl) applied at the cotyledon stage and 2- to 4-leaf stages. Half rates of Nortron applied preemergence provided similar control to the full rate. Microrates of postemergence herbicides provided similar to slightly less control than standard postemergence treatments. Rescue treatments where no herbicides were applied until the 2- to 4-leaf stage provided similar control to the standard postemergence treatments.

Introduction

This is the fourth year of both commercial sugar beet production and herbicide trials conducted in the Prineville and Culver areas of central Oregon. This project focused on comparing standard and half-rates of Nortron and Pyramin (pyrazon) applied preemergence, comparing applications of Betamix plus Upbeet and Betamix Progress (desmedipham + ethofumesate + phenmedipham) plus Upbeet, evaluating two microrate postemergence applications, and two rescue treatments where no herbicides were applied until the 2- to 4-leaf stage.

Methods and Materials

Treatments applied preemergence were made April 22 at Culver and May 1 at Prineville. Treatments applied postemergence were made at the cotyledon stage May 6 at Culver and May 18 in Prineville. The second postemergence treatments were made at the two-leaf stage May 15 at Culver and May 27 at the four-leaf stage at Prineville. A third postemergence application was made at the Prineville location June 5.

Treatments were applied with a CO₂-pressurized, hand-held boom sprayer at 40 psi and 20-gal/a water. Plots 10 ft x 22 ft were replicated four times in a randomized complete block design. Treatments at the Culver location were evaluated for percent control of common lambsquarters, henbit, hairy nightshade and kochia June 24 and for crop injury and overall weed control on July 7. Evaluations of treatments at the Prineville location were made June 19 and July 7 for redroot pigweed, hairy nightshade, kochia, and common lambsquarters.

Results and Discussion

Results from the Prineville location is provided in Table 1 and from the Culver location in Table 2. Nortron at the full rate followed by Betamix plus Upbeet provided 97-98 percent overall weed control, Pyramin gave 87-91 percent overall weed control, and a combination of the two provided 88-95 percent overall weed control. A reduction in Nortron applied preemergence from 3 pt/a to 1.5 pt/a reduced overall weed control 3 percent at each of the two locations.

Reducing

the rate of Pyramin from 4.6 lb/a to 2 lb/a reduced overall weed control by 6 percent (Culver) and 9 percent (Prineville). All treatments with both preemergence and postemergence applications provided greater weed control than postemergence treatments alone.

Postemergence application of Betamix plus Upbeet and Betamix Progress plus Upbeet provided similar weed control. In previous years Betamix plus Upbeet has out-performed Betamix Progress plus Upbeet. Microrate applications of Betamix at 0.33 oz/a plus Upbeet at 0.25-0.33 oz/a plus Stinger at 1.3 fl oz/a plus methylated seed oil (MSO) at 1.5 % v/v provided similar to slightly less weed control than standard postemergence applications. Rescue treatments not applied until the second postemergence application included Betamix at 2 pt/a plus Upbeet at 0.5 oz/a plus Stinger at 4 oz/a plus MSO at 1.5 % v/v, with and without UN32 at 4 % v/v. The performance was similar to the standard postemergence herbicide treatments.

Since similar weed control was provided by preemergence applications of Nortron and Pyramin at two-thirds rates in 1997 and half rates in 1998, reducing the rate of these applications could be cost effective while still providing adequate weed control. However, eliminating these preemergence treatments altogether could significantly increase the risk of weed problems unless there were no problems associated with replanting or timely application of postemergence herbicides. In general, treatments that included Nortron applied preemergence provided greater kochia control than those without.

Table 1. Effect of herbicide application on sugar beets near Prineville, OR, evaluated June 19, 1998.

		Application (product/a)				Percent Weed Control				Average
		Preemergence	Cotyledon	Two-leaf	Four-leaf	Nightshade	Pigweed	Kochia	Lambsquarters	
1.	Nortron	1.5 pt				98.7 a	99.5 a	89.5 a	93.7 a	95.3
	Betamix		1.5 pt	2.0 pt						
	Upbeet		0.5 pt	0.5 oz						
2.	Nortron	3 pt				98.5 a	100 a	92.5 a	98.3 a	97.3
	Betamix		1.5 pt	2.0 pt						
	Upbeet		0.5 oz	0.5 oz						
3.	Pyramin	2 lb				98.5 a	94 a	55 ab	81.3 a	82.2
	Betamix		1.5 pt	2.0 pt						
	Upbeet		0.5 oz	0.5 oz						
4.	Pyramin	4.6 lb				99.3 a	98.7 a	52 ab	99 a	87.3
	Betamix		1.5 pt	2.0 pt						
	Upbeet		0.5 oz	0.5 oz						
5.	Nortron	1 pt				98.7 a	100 a	57.5 ab	96.3 a	88.1
	Pyramin	0.8 lb								
	Betamix		1.5 pt	2.0 pt						
	Upbeet		0.5 oz	0.5 oz						
6.	Betamix Progress		1.2 pt	1.7 pt		97.7 a	96.7 a	72.5 ab	62 a	82.2
7.	Betamix Progress		1.2 pt	1.7 pt		95.7 a	95.7 a	58.7 ab	81.3 a	82.8
	Upbeet		0.5 oz	0.5 oz						
8.	Betamix		1.5 pt	2.0 pt		93.5 a	52.5 b	42.5 ab	79.5 a	67
9.	Betamix		1.5 pt	2.0 pt		94.3 a	92.5 a	54.5 ab	59.5 a	75.2
	Upbeet		0.5 oz	0.5 oz						
10.	Betamix		0.5 pt	0.5 pt	0.5 pt	94 a	85 ab	37.5 ab	88.5 a	76.3
	Upbeet		0.33 oz	0.33 oz	0.33 oz					
	Stinger		1.33 fl oz	1.33 fl oz	1.33 fl oz					
	MSO		1.5 %	1.5 %	1.5 %					
11.	Betamix		0.5 pt	.5 pt	.5 pt	93 a	79.5 ab	41.3 ab	70.7 a	71.1
	Upbeet		0.25 oz	0.25 oz	0.25 oz					
	Stinger		1.33 fl oz	1.33 fl oz	1.33 fl oz					
	MSO		1.5%	1.5%	1.5%					
12.	Betamix			2.0 pt	2.0 pt	98.3 a	95 a	46.3 ab	86.3 a	81.5
	Upbeet			0.5 oz	0.5 oz					
	Stinger			4 oz						
	MSO			1.5%	1.5%					
13.	Betamix			2.0 pt	2.0 pt	97.3 a	55.7 ab	71.3 ab	88.7 a	78.3
	Upbeet			0.5 oz	0.5 oz					
	Stinger			4 oz						
	MSO			1.5%	1.5%					
	UN32			4%	4%					
14.	Untreated			---	---	0 b	0 c	0 b	0 b	0

Table 2. Effect of herbicide application on sugar beets near Culver, OR, evaluated June 24, 1998.

Treatments		Application (product/a)			Percent Weed Control				
		Preemergence	Cotyledon	Two-leaf	Nightshade	Henbit	Kochia	Lambsquarters	Average
1.	Nortron Betamix Upbeet	1.5 pt	1.5 pt 0.5 pt	2.0 pt 0.5 oz	94 a	98.3 a	92.5 a	95 a	94.9
2.	Nortron Betamix Upbeet	3 pt	1.5 pt 0.5 oz	2.0 pt 0.5 oz	100 a	99.5 a	91.3 a	100 a	97.7
3.	Pyramin Betamix Upbeet	2 lb	1.5 pt 0.5 oz	2.0 pt 0.5 oz	92.5 a	75 a	67.5 a	97.5 a	83.1
4.	Pyramin Betamix Upbeet	4.6 lb	1.5 pt 0.5 oz	2.0 pt 0.5 oz	99 a	99 a	66.3 a	100 a	91.1
5.	Nortron Pyramin Betamix Upbeet	1 pt 0.8 lb	1.5 pt 0.5 oz	2.0 pt 0.5 oz	95 a	98.7 a	91.3 a	96.3 a	95.3
6.	Betamix Progress Upbeet		1.2 pt 0.5 oz	1.7 pt 0.5 oz	92.5 a	95.7 a	60 a	100 a	87.1
7.	Betamix Upbeet		1.5 pt 0.5 oz	2.0 pt 0.5 oz	81.3 a	97.3 a	81.3 a	100 a	90
8.	Betamix Upbeet Stinger MSO		0.5 pt 0.33 oz 1.33 fl oz 1.5 %	0.5 pt 0.33 oz 1.33 fl oz 1.5 %	86.3 a	75 a	82.5 a	91.3 a	83.8
9.	Betamix Upbeet Stinger MSO		0.5 pt 0.25 oz 1.33 fl oz 1.5 %	0.5 pt 0.25 oz 1.33 fl oz 1.5 %	92.5 a	72.5 a	77.5 a	91.3 a	83.4
10.	Betamix Upbeet Stinger MSO			2.0 pt 0.5 oz 4 oz 1.5 %	85 a	62.5 a	71.3 a	98.7 a	79.4
11.	Betamix Upbeet Stinger MSO UN32			2.0 pt 0.5 oz 4 oz 1.5 % 4 %	90.7 a	80 a	73.7 a	97.5 a	85.5
12.	Untreated			----	0 b	0 b	0 b	0 b	0

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