COMPARISONS OF ETHOTRON, NORTRON, AND ETHOFUMESATE 4SC APPLIED PREPLANT INCORPORATED, PREEMERGENCE, AND POSTEMERGENCE IN 2016

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The objective of this study was to compare sugarbeet crop safety along with grass and small seeded broadleaf weed control from Ethotron, Nortron, and Ethofumesate 4SC in Roundup Ready (RR) sugarbeet.

MATERIALS AND METHODS

An experiment was conducted near Hickson, ND in 2016. The trial site was prepared using a Kongskilde 's-tine' field cultivator with rolling baskets on May 20, 2016. Preplant-incorporated (PPI) treatments were applied prior to seeding and incorporated with a 7' Frontier rototiller. All plots were rototilled to remove tillage variability among plots. Bioassay strips of quinoa, common lambsquarters, redroot pigweed, foxtail millet, and oat were established by spreading seeds by hand perpendicular to herbicide treatments and then harrow incorporating the seeds. 'SV36272RR' sugarbeet, treated with NipsIt Suite, Tachigaren at 45g per unit, and Kabina at 7g per unit, was seeded in 22-inch rows at 60,560 seeds per acre on June 8 with a John Deere 1700XP 6-row planter. Preemergence (PRE) treatments were applied immediately after seeding. Postemergence (POST) treatments were applied June 16. All herbicide treatments were applied with a bicycle sprayer in 17 gpa spray solution through 8002 XR flat fan nozzles pressurized with CO2 at 40 psi to the center four rows of six row plots 30 feet in length. Weed control was evaluated June 9, 15, and 22. Sugarbeet injury was evaluated June 9, 15, 22, and 28.

All evaluations were a visual estimate of percent fresh weight reduction in the four treated rows compared to the adjacent untreated strip. Experimental design was randomized complete block with 4 replications for each trial. Data were analyzed with the ANOVA procedure of ARM, version 2016.4 software package.

Table 1. Application Information – Hickson, ND 2016

	Application Timing		
	A – Preplant Incorporated	B – Preemergence	C - Postemergence
Date	20 May	20 May	16 June
Time of Day	10:00 AM	10:30 AM	8:00 AM
Air Temperature (F)	65	66	65
Relative Humidity (%)	48	48	75
Wind Velocity (mph)	10	10	6
Wind Direction	S	S	E
Soil Temp. (F at 6")	56	56	63
Soil Moisture	Dry	Dry	Good
Cloud Cover (%)	25	25	0
Date of next rainfall	May 25 (0.44")	May 25 (0.44")	June 18 (0.9")
Sugarbeet stage (avg)	-	-	4-6 leaf
quinoa	-	-	3 inch
common lambsquarters	-	-	1.5 inch
foxtail millet	-	-	2 inch
oat	-	-	3 inch
redroot pigweed	-	-	2 inch

SUMMARY

Sugarbeet injury from PPI treatments (Table 2) was significantly greater than from PRE or POST treatments at the June 15 evaluation. Injury was similar among Nortron, Ethotron, or Ethofumesate 4SC applied PPI and ranged from 20% to 30%. However, the sugarbeet injury observed on June 15 was short lived as no significant injury was observed from any treatment at the June 22 evaluation. While ethofumesate products may provide some early season injury when applied PPI or PRE, they are generally safe for use in sugarbeet. Nortron, Ethotron, and Ethofumesate 4SC showed excellent crop safety at the June 22 evaluation when applied POST at labeled rates in sugarbeet.

Nortron, Ethotron, and Ethofumesate 4SC applied PPI or PRE significantly improved weed control at the June 15 evaluation compared to when no soil herbicide was applied. Common lambsquarters and redroot pigweed control tended to be greater from products applied PPI compared to the same products applied PRE. Quinoa, foxtail millet, and oat control was similar among products applied PPI or PRE. No significant differences in sugarbeet injury or weed control were observed among Nortron, Ethotron, or Ethofumesate 4SC when applied in the same manner, whether PPI or PRE. However, PRE applied Nortron tended to show greater activity on sugarbeet and all weed species except quinoa compared to Ethotron or Ethofumesate 4SC at the June 15 evaluation.

Nortron, Ethotron, and Ethofumesate 4SC applied POST showed similar weed control among all species evaluated on June 22. The application of PowerMax following PPI or PRE ethofumesate products gave similar weed control compared to PowerMax alone as observed June 22.

Table 2. Sugarbeet Injury and weed control from Nortron, Ethotron, and Ethofumesate 4SC applied at different timings in sugarbeet at Hickson, ND in 2016.

			----------15 – June----------						----------22 – June----------					
Treatment[1]	Rate	Appl[2]	sgbt[3]	quin	colq	rrpw	fxmi	oat	sgbt	quin	colq	rrpw	fxmi	oat
			% inj	---------% control---------					% inj	---------% control---------				
Nortron	6 pt/a	A	20	59	75	91	96	89	1	99	99	100	100	100
Ethotron	6 pt/a	A	30	58	79	95	94	93	0	96	98	100	100	100
Ethofumesate 4SC	6 pt/a	A	25	58	79	90	93	89	3	99	100	100	100	100
Nortron	6 pt/a	B	10	55	71	78	94	95	0	96	100	100	100	100
Ethotron	6 pt/a	B	0	58	63	68	89	89	0	99	100	100	100	99
Ethofumesate 4SC	6 pt/a	B	3	60	63	60	88	91	0	98	98	100	100	100
Nortron	12 fl oz/a	C	0	0	0	0	0	0	4	96	100	100	100	100
Ethotron	12 fl oz/a	C	0	0	0	0	0	0	0	95	100	100	100	100
Ethofumesate 4SC	12 fl oz/a	C	0	0	0	0	0	0	1	100	99	100	100	100
RU PowerMax	12 fl oz/a	C	0	0	0	0	0	0	1	96	98	100	100	100
Untreated Check			0	0	0	0	0	0	0	0	0	0	0	0
LSD (0.05)			**10.1**	**16.1**	**12.6**	**14.6**	**11.6**	**15.2**	**NS**	**9.4**	**2.7**	**1.0**	**1.0**	**1.1**

[1]All treatments applied at either the A or B application timing were treated at the C application timing with Roundup PowerMax at 32 fl oz/A + NIS at 0.25% v/v + AMS at 8.5 lb/100 gal. Treatments applied at the C application timing were tank mixed with Roundup PowerMax at 32 fl oz/A + Destiny HC at 1.5 pt/A + AMS at 8.5 lb/100 gal. Prefer 90 NIS provided by West Central. N-Pak AMS and Destiny HC provided by Winfield.
[2]Appl = application timings listed in Table 1. A=PPI, B=PRE, C= POST
[3]sgbt = sugarbeet, quin = quinoa, colq = common lambsquarters, rrpw = redroot pigweed, fxmi = foxtail millet, inj = injury

CONCLUSION

Lambsquarters and pigweed control tended to be greater from PPI applications of ethofumesate compared to PRE applications. This spring was relatively dry, but this trial received 1.05 inches of rain during the 7 days following planting which was more than adequate to activate PRE applied products. Applying ethofumesate products PPI compared to PRE may improve control of tough weeds like common lambsquarters. Nortron, Ethotron, and Ethofumesate 4SC performed very similar in terms of weed control and crop safety regardless of method of application.