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Industrial Weed Control with Plainview SC

R.S. Currie and P.W. Geier

Summary

The objective of this research was to determine application variable influence on Plainview SC (aminocyclopyrachlor/imazapyr/indaziflam) efficacy in an industrial setting. Plainview SC was applied at three rates and three application timings using two nozzle types to compare season-long weed control in noncropland. Late-season kochia control was best when Plainview SC was applied at 48 or 64 oz/a using flat-fan nozzles. Application timing did not affect these treatments. Similar control using the boomless nozzle required 64 oz/a of Plainview SC be applied either in fall or winter.

Introduction

Maintaining season-long, weed free conditions at industrial sites has several benefits. Locations such as power stations, railroads, and rights-of-way use nonselective, persistent herbicides to improve visibility, reduce fire hazards, and facilitate maintenance. Sprayers equipped with boomless nozzles are popular for these applications due to their ease of use and minimal input costs compared to traditional boom sprayers. The objective of the study was to compare Plainview SC at three rates and three application timings using two nozzle systems for efficacy in noncropland.

Experimental Procedures

An experiment was conducted to evaluate persistent, nonselective herbicides at three application timings and three rates for season-long weed control in an industrial setting. Herbicides were applied using either standard flat-fan nozzles or a boomless nozzle. A tractor-mounted, compressed-CO₂ sprayer delivering 25 gpa was used to apply all herbicides. Pressure and ground speed for the flat-fan nozzles were 30 psi and 4.1 mph, whereas 60 psi and 3.0 mph were used for the boomless nozzle applications. Application and environmental conditions are shown in Table 1. Plots size was 10 by 35 feet and arranged in a randomized complete block with four replications. Soil was a Ulysses silt loam with 2.7% organic matter, pH of 7.9, and CEC of 28.4. Visual weed control was determined on May 5, July 5, and October 3, 2022. These dates were 1, 3, and 6 months after the spring applications (MA-C), respectively.

Results and Discussion

Kochia control was 98% or more with all treatments except Plainview SC at 32 oz/a applied in the fall using a boomless nozzle at 1 MA-C, or any rate of Plainview SC applied in the spring using a boomless nozzle (Table 2). These treatments also controlled kochia less than 90% at 3 MA-C. By 6 MA-C, kochia control was best when Plainview SC at 48 or 64 oz/a was applied through flat-fan nozzles regardless of application timing. Similar kochia control at 6 MA-C with the boomless nozzle only occurred

when Plainview SC was applied at 64 oz/a in the fall or winter (80 to 83%). These results indicate that higher rates and earlier application times are needed when using boomless nozzle systems compared to traditional sprayers.

Acknowledgments

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Table 1. Application, environmental, and weed data for the industrial weed control study

Application timing	Fall	Winter	Spring
Application date	November 15, 2021	February 18, 2022	April 4, 2022
Air temperature, °F	81	58	65
Relative humidity	14	23	20
Soil temperature, °F	53	42	55
Wind speed, mph	3 to 8	3 to 6	5 to 9
Wind direction	North	Northwest	South-southeast
Soil moisture	Dry	Fair	Dry
Kochia			
Height, inches	---	---	0.5
Density, plants/ft ²	0	0	10

Table 2. Kochia control in the industrial weed control study

Treatment	Rate¹	Timing	Nozzle²	1 MA-C³	3 MA-C	6 MA-C
	lb/a			----- % Visual -----		
Plainview SC Glyphosate Nonionic surfactant	32 64 0.25%	Fall	Flat fan	100	91	70
Plainview SC Glyphosate Nonionic surfactant	48 64 0.25%	Fall	Flat fan	98	96	88
Plainview SC Glyphosate Nonionic surfactant	64 64 0.25%	Fall	Flat fan	100	95	88
Plainview SC Glyphosate Nonionic surfactant	32 64 0.25%	Fall	Boomless	93	81	68
Plainview SC Glyphosate Nonionic surfactant	48 64 0.25%	Fall	Boomless	100	91	79
Plainview SC Glyphosate Nonionic surfactant	64 64 0.25%	Fall	Boomless	100	93	80
Plainview SC Glyphosate Nonionic surfactant	32 64 0.25%	Winter	Flat fan	100	94	78
Plainview SC Glyphosate Nonionic surfactant	48 64 0.25%	Winter	Flat fan	99	98	89
Plainview SC Glyphosate Nonionic surfactant	64 64 0.25%	Winter	Flat fan	100	98	91
Plainview SC Glyphosate Nonionic surfactant	32 64 0.25%	Winter	Boomless	99	91	70
Plainview SC Glyphosate Nonionic surfactant	48 64 0.25%	Winter	Boomless	100	93	79
Plainview SC Glyphosate Nonionic surfactant	64 64 0.25%	Winter	Boomless	100	96	83
Plainview SC Glyphosate Nonionic surfactant	32 64 0.25%	Spring	Flat fan	99	93	74
Plainview SC Glyphosate Nonionic surfactant	48 64 0.25%	Spring	Flat fan	100	96	83

continued

Table 2. Kochia control in the industrial weed control study

Treatment	Rate ¹ lb/a	Timing	Nozzle ²	% Visual		
				1 MA-C ³	3 MA-C	6 MA-C
Plainview SC Glyphosate Nonionic surfactant	64 64 0.25%	Spring	Flat fan	100	97	90
Plainview SC Glyphosate Nonionic surfactant	32 64 0.25%	Spring	Boomless	76	79	65
Plainview SC Glyphosate Nonionic surfactant	48 64 0.25%	Spring	Boomless	81	83	73
Plainview SC Glyphosate Nonionic surfactant	64 64 0.25%	Spring	Boomless	79	80	74
LSD (0.05)				5	7	14

¹ Plainview SC rate is pounds ai/a, glyphosate rate is pounds ae/a.

² Flat fan nozzles were six TeeJet TT11003, boomless nozzle was a single TeeJet OC-12.

³ MA-C = months after the spring applications.



Figure 1. Untreated control.



Figure 2. Plainview SC 64 oz/a plus glyphosate 64 oz/a, applied in the fall using flat fan nozzles. Photo taken 246 days after the fall treatments.



Figure 3. Plainview SC 64 oz/a plus glyphosate 64 oz/a, applied in winter using flat fan nozzles. Photo taken 151 days after the winter applications.



Figure 4. Plainview SC 32 oz/a plus glyphosate 64 oz/a, applied in the spring using a boomless nozzle. Photo taken 106 days after the spring applications.



Figure 5. Plainview SC 64 oz/a plus glyphosate 64 oz/a, applied in the spring using a boomless nozzle. Photo taken 106 days after the spring applications.