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Prodiamine 4L – Formulation Bridging

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Abstract

The objectives of the formulation-bridging study were to identify if the new 4L formulation of prodiamine provided crabgrass control comparable to the current 4FL formulation, identify if there is a difference in spraying characteristics between the treatments after they are allowed to set for 24 hours, and evaluate if the new formulation is safe to turf.

Keywords

Horticulture

Disciplines

Agricultural Science | Agriculture | Horticulture

Prodiamine 4L – Formulation Bridging

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Introduction

The objectives of the formulation-bridging study were to identify if the new 4L formulation of prodiamine provided crabgrass control comparable to the current 4FL formulation, identify if there is a difference in spraying characteristics between the treatments after they are allowed to set for 24 hours, and evaluate if the new formulations is safe to turf.

Materials and Methods

This study was conducted at the Iowa State University Horticulture Research Station, Ames, IA. The study used a stand of ‘Moonlight’ Kentucky bluegrass, established approximately one year earlier. The soil on the site was a disturbed Nicollet clay soil, with a pH of 7.05, 15 ppm phosphorus, 110 ppm potassium, and 4.5 percent organic matter.

The study was arranged in a randomized complete block design, with four replications and eight treatments (Table 1). The area was seeded with crabgrass April 28, and all treatments were applied May 1. Treatments were applied using a CO₂ backpack sprayer at 40 psi, and a spray volume equivalency rate of three gallons/1,000 ft², using TeeJet[®] 8002VS nozzles.

Crabgrass ratings began on May 7, and continued until September 17. It should be noted that there were no data for the May 7 rating, because there was no visible crabgrass in the plots at that time.

Results and Discussion

There were no noticeable differences in spraying characteristics of the new formulation. However, we did notice a difference in the amount of chemical settling out of solution between the treatments that were allowed to sit for 24 hours. We had difficulty getting all the chemical into suspension with the current formulation after allowing it to sit.

All treatments provided acceptable crabgrass control (> 84%) through the second week of August (Table 2). The new 4L formulation provided comparable control to the current prodiamine formulation at both rates, and for the two treatments that were allowed to sit for 24 hours. It should be noted that, due to the stage of crabgrass, the September 17 rating was assessed using a grid-count method; all other ratings were assessed visually. However, using the grid-count method, there was no difference in control. Treatments 2, 5, and 7 appeared to have an outlier in one of their replications where the control was considerably less. This could be due to the maturity of the turf stand, that is, there were isolated areas in the study where the bluegrass had not fully filled in. Crabgrass population ratings indicated the same trend with no differences between the new and current formulations (Table 3).

We did observe phytotoxicity to some of the plots, but the statistical analysis indicated no difference among treatments (Table 4). The new and current formulations both caused some slight phytotoxicity, but all ratings were above the acceptable rating of 6 (9 = no phyto, 1 = worst phyto, 6 = acceptable turf).

Table 1. Treatments for turf prodiamine study.

Trt	Syngenta ID	Chemical	Product/AI rate	Product/AI rate unit	Converted rate	Converted rate unit	Application timing ⁴	Rate/25 ft ²
1	Control							
2	A12333D	Barricade	560	ga/ha ²	16	flozpr/A ³	A	0.27 mL
3	A12333D	Barricade	840	ga/ha	24	flozpr/A	A	0.41 mL
4	A12333G	New Formulation	560	ga/ha	16	flozpr/A	A	0.27 mL
5	A12333G	New Formulation	840	ga/ha	24	flozpr/A	A	0.41 mL
6	EW Dimension	Dithiopyr	280	ga/ha	16	flozpr/A	A	0.27 mL
7 ¹	A12333D	Barricade	560	ga/ha	16	flozpr/A	A	0.27 mL
8 ¹	A12333G	New Formulation	560	ga/ha	16	flozpr/A	A	0.27 mL

¹Mix 1 day early.²Ga/ha = grams active per hectare.³Fluid ounce of product per acre.⁴A = first application.**Table 2. Percentage crabgrass control.**

Trt ¹	May 7	May 16	May 31	Jun 14	Jul 3	Jul 21	Aug 8	Sep 17
1	NWP ²	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	NWP	96.3	97.3	97.5	90.0	88.3	84.5	61.8
3	NWP	98.0	98.8	99.0	97.0	96.3	95.8	88.5
4	NWP	96.0	96.3	96.0	90.0	88.0	88.0	80.5
5	NWP	98.3	97.8	97.0	92.8	91.5	89.8	83.0
6	NWP	98.5	99.0	99.0	98.5	94.3	91.5	82.5
7	NWP	97.8	97.5	97.3	90.8	91.5	88.3	79.0
8	NWP	97.3	98.3	98.5	97.3	94.8	94.8	90.3
LSD (0.05)	-	3.5	3.3	3.7	10.5	9.9	11.1	22.9

¹Treatment details are shown in Table 1.²Indicates no weeds present at the time of rating.

Table 3. Percentage crabgrass population.

Trt ¹	May 7	May 16	May 31	Jun 14	Jul 3	Jul 21	Aug 8	Sep 17
1	NWP ²	9.8	17.5	26.3	50.0	65.0	53.8	74.3
2	NWP	3.8	2.8	2.5	10.0	11.8	15.5	38.3
3	NWP	2.0	1.3	1.0	3.0	3.8	4.3	11.5
4	NWP	4.0	3.8	4.0	10.0	12.0	12.0	19.5
5	NWP	1.8	2.3	3.0	7.3	8.5	10.3	17.0
6	NWP	1.5	1.0	1.0	1.5	5.8	8.5	17.5
7	NWP	2.3	2.5	2.8	9.3	8.5	11.8	21.0
8	NWP	2.8	1.8	1.5	2.8	5.3	5.3	9.8
LSD (0.05)	-	4.1	3.6	5.3	11.3	11.4	13.5	22.7

¹Treatment details are shown in Table 1.

²Indicates no weeds present at the time of rating.

Table 4. Phytotoxicity ratings (9 = no phyto, 1 = worst phyto, 6 = acceptable turf).

Trt ¹	May 7	May 16	May 31	Jun 14	Jul 3	Jul 21	Aug 8
1	9.0	8.0	8.8	9.0	9.0	9.0	9.0
2	9.0	8.5	7.8	9.0	9.0	9.0	9.0
3	9.0	8.5	9.0	9.0	9.0	9.0	9.0
4	9.0	8.5	8.5	9.0	9.0	9.0	9.0
5	9.0	7.8	8.5	9.0	9.0	9.0	9.0
6	9.0	8.5	8.8	9.0	9.0	9.0	9.0
7	9.0	8.8	8.5	9.0	9.0	9.0	9.0
8	8.8	7.8	7.5	9.0	9.0	9.0	9.0
LSD (0.05)	NS	NS	NS	NS	NS	NS	NS

¹Treatment details are shown in Table 1.