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Prodiamine 4L – Formulation Bridging

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Objectives:

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. The study was set up on 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 28 April, and all treatments were applied 1 May. Treatments were applied using a CO₂ backpack sprayer at 40 psi, and a spray volume equivalency rate of three gallons/1000 ft², using TeeJet® 8002VS nozzles.

Crabgrass ratings began on 7 May, and continued until 17 September. It should be noted that there were no data for the 7 May rating, as there was not any visible crabgrass in the plots at that time.

Results:

There were not any 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 a difficult time getting all of the chemical into suspension with the current formulation after allowing it to set.

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 set for 24 hours. It should be noted that, due to the stage of crabgrass, the 17 September rating was assessed using a grid-count method; all other ratings were assessed visually. However, using the grid-count method, there appeared to be no statistical 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 stand of turf; there were isolated areas in the study where the bluegrass had not fully filled in. Crabgrass population ratings indicated the same trend, no difference between the new and current formulations (Table 3).

We did observe some phytotoxicity to some of the plots, but the statistical analysis indicated no significant 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. Treatment list								
Treatment	Syngenta ID	Chemical	Product/AI Rate	Product/AI Rate Unit	Converted Rate	Converted Rate Unit	Application Code	Rate per 25 ft ²
1	Control							
2	A12333D	Barricade	560	GA/HA	16	FLOZPR/A	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	Dimension EW	Dithiopyr	280	GA/HA	16	FLOZPR/A	A	0.27 mL
7*	A12333D	Barricade	560	GA/HA	16	FLOZPR/A	A	0.27 mL
8*	A12333G	New Formulation	560	GA/HA	16	FLOZPR/A	A	0.27 mL

*Mix 1 day early

Treatment	7-May	16-May	31-May	14-Jun	3-Jul	21-Jul	8-Aug	17-Sep
1	*NWP	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

*Indicated no weeds present at the time of the rating

Treatment	7-May	16-May	31-May	14-Jun	3-Jul	21-Jul	8-Aug	17-Sep
1	*NWP	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

*Indicates no weeds present at the time of the ratings

Treatment	7-May	16-May	31-May	14-Jun	3-Jul	21-Jul	8-Aug
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