Stop #4b: Manuscript (Pinoxaden) – A New Postemergence Grass Herbicide for Warm-Season Turf

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Background and Objectives:

Manuscript (pinoxaden) is a new herbicide from Syngenta that was Federally registered in August 2018. California registration is expected in 2019. Pinoxaden is a Group 1 Herbicide, ACCase inhibitor. Specifically, it represents a new class of ACCase inhibitors called "DENs" (vs. "FOPs" and "DIMs"). The first Manuscript label includes use on bermudagrass, zoysiagrass, and St. Augustinegrass sod for postemergence control of crabgrass, broadleaf signalgrass, bull and thin paspalum, ryegrass, and carpetgrass. Typical rate is 19.6 oz/A broadcast or 9.6 oz/10,000 ft^2 or less for spot treatments. The objectives of this research were to evaluate efficacy of Manuscript applied once or twice as broadcast or spot treatments for postemergence control of smooth crabgrass at early and late tillering stages. Drive XLR8 (quinclorac) herbicide was compared as an industry standard.

Materials and Methods:

The study was conducted from June to September 2018 on mature 'GN-1' hybrid bermudagrass turf mowed 3 days/wk at 0.5 inches. Soil was a Hanford fine sandy loam. Turf received no fertilizer in 2018 until August (0.5 lb N/M). Herbicide treatments (Table 1) were applied using a CO_2-powered backpack sprayer with TeeJet 8002VS nozzles calibrated to deliver 1 gal/1000 ft^2 for broadcast applications and TeeJet 8003VS nozzles calibrated to deliver 2 gal/1000 ft^2 for spray-to-wet applications. Experimental design was a randomized block with 5 replications. Plot size was 4 ft x 6 ft with 2-ft alleys. Plots were evaluated for turf injury and smooth crabgrass cover beginning at the time of initial herbicide application.

Results:

Crabgrass control data are presented in Table 2. Although most of the crabgrass was treated at either 2-3 or 5-7 tiller stages, some plants were even more mature at each application timing, thus representing a late or worse case scenario for postemergence control of this species. Two applications of Manuscript were best on younger crabgrass compared to a single application of this herbicide or Drive XLR8. On more mature crabgrass, two applications of Manuscript spray-to-wet were most effective compared to one application or even two broadcast applications. Furthermore, two spray-to-wet applications of Drive XLR8 were ineffective on the older crabgrass populations. Bermudagrass injury from herbicide treatments was negligible throughout the study (data not shown). In summary, Manuscript provided very good selective control of smooth crabgrass in bermudagrass turf. Optimal control would be expected when

applications are made to more juvenile crabgrass prior to tillering. However, when later timing is unavoidable, it is best to use higher spray volumes containing Manuscript for more effective control.

Acknowledgments

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Table 1. Treatments and application information in the postemergence crabgrass study. 2018. Riverside, CA.

Trt	Product(s)	Rate	Timing	Crabgrass Stage	Application
1	Untreated	--	--	--	--
2	Manuscript	41.8 oz/A	A	2-3 tiller	Broadcast
2	NIS	0.5% v/v	A	2-3 tiller	Broadcast
3	Manuscript	41.8 oz/A	AB	2-3 tiller + 14 DAA	Broadcast
3	NIS	0.5% v/v	AB	2-3 tiller + 14 DAA	Broadcast
4	Drive XLR8	64 oz/A	A	2-3 tiller	Broadcast
4	MSO	0.5% v/v	A	2-3 tiller	Broadcast
5	Manuscript	41.8 oz/A	C	5-7 tiller	Broadcast
5	NIS	0.5% v/v	C	5-7 tiller	Broadcast
6	Manuscript	41.8 oz/A	CE	5-7 tiller + 14 DAC	Broadcast
6	NIS	0.5% v/v	CE	5-7 tiller + 14 DAC	Broadcast
7	Manuscript	9.6 oz/10 gal	D	5-7 tiller	Spray-to-wet
7	NIS	0.5% v/v	D	5-7 tiller	Spray-to-wet
8	Manuscript	9.6 oz/10 gal	DF	5-7 tiller + 14 DAD	Spray-to-wet
8	NIS	0.5% v/v	DF	5-7 tiller + 14 DAD	Spray-to-wet
9	Drive XLR8	7.5 oz/10 gal	DF	5-7 tiller + 14 DAD	Spray-to-wet
9	MSO	0.5% v/v	DF	5-7 tiller + 14 DAD	Spray-to-wet

DA = Days after Timing (A, C, or D).

A = 6/10/18
B = 6/24/18
C = 7/9/18
D = 7/9/18
E = 7/24/18
F = 7/24/18

Table 2. Effects of herbicides on postemergence control (0-100%) of smooth crabgrass. 2018. Riverside, CA.

Trt	Product(s)	Timing	Application	6/24/18	7/24/18	8/28/18
1	Untreated	--	--	0 c	0 e	0 d
2	Manuscript	A	Broadcast	67 a	50 b	19 cd
2	NIS	A	Broadcast			
3	Manuscript	AB	Broadcast	66 a	82 a	74 a
3	NIS	AB	Broadcast			
4	Drive XLR8	A	Broadcast	22 b	0 e	0 d
4	MSO	A	Broadcast			
5	Manuscript	C	Broadcast	0 c	10 de	0 d
5	NIS	C	Broadcast			
6	Manuscript	CE	Broadcast	0 c	25 cd	28 bc
6	NIS	CE	Broadcast			
7	Manuscript	D	Spray-to-wet	0 c	41 bc	42 b
7	NIS	D	Spray-to-wet			
8	Manuscript	DF	Spray-to-wet	0 c	47 bc	87 a
8	NIS	DF	Spray-to-wet			
9	Drive XLR8	DF	Spray-to-wet	0 c	0 e	0 d
9	MSO	DF	Spray-to-wet			

Means followed by the same letter in a column are not significantly different (*P* = 0.05).

A = 6/10/18
B = 6/24/18
C = 7/9/18
D = 7/9/18
E = 7/24/18
F = 7/24/18