

Mesotrione Applications for Postemergence Crabgrass Control

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Introduction

The objective of this research was to determine the following: 1) what rates of mesotrione provide acceptable (> 80%) weed control, 2) if these rates are nonphytotoxic to turfgrasses, 3) if the addition of prodiamine is beneficial at late postemergence timings, and 4) if the residual activity is acceptable.

Materials and Methods

The experiment was conducted at the Iowa State University Horticulture Research Station in 2005. The research area consisted of an unknown variety of Kentucky bluegrass (*Poa pratensis* L.) uniformly interseeded with crabgrass seed. Soil type was a Nicollet (fine, loamy, mixed Mesic-Aquic Hapludolls) with 8 ppm P (phosphorus), 60 ppm K (potassium), 2.4% organic matter, and a pH of 7.5. All turf was regularly irrigated and maintained at a 2 in. mowing height. The trial was arranged as a randomized complete block design with three replications. On June 6, 2005, mesotrione was applied at 0.2, 0.25, 0.3, 0.45, and 0.5 lb ai/acre to crabgrass plants at tiller initiation. Four weeks later on July 5, 2005, four plots in each block received a second application of mesotrione at 0.2, 0.25, 0.3, and 0.5 lb ai/acre.

The percentage of crabgrass control was evaluated 2, 4, 8, and 12 weeks after treatment (WAT). In order to ensure validity of the recorded data, the percentage of crabgrass control taken 2 and 4 WAT represents the number of crabgrass plants/plot, whereas values for 8 and 12 WAT represent the percentage of

crabgrass cover/plot. Turfgrass phytotoxicity was evaluated 1, 2, 3, and 4 weeks after each application on a scale of 1–9, with 1=worst, 6=acceptable, and 9=best.

All data were analyzed using the general linear models procedure of SAS. Crabgrass control and phytotoxicity means were compared by using an F-protected least significant different test. All tests of significance were made at $P \leq 0.05$.

Results and Discussion

Mesotrione applications provided effective postemergence control of crabgrass. Crabgrass populations 2 and 4 WAT were 77 to 94% less compared with untreated controls and were 83 to 96% less compared with the control using no fertilizer (Table 1). Single mesotrione applications at 0.5 lb ai/acre and applications of mesotrione with prodiamine at 0.45 lb ai/acre provided >80% crabgrass control. However, the application of prodiamine alone did not increase crabgrass control (Table 1). All plots receiving two postemergence applications of mesotrione exhibited >80% crabgrass control with the 0.25, 0.3, and 0.5 lb ai/acre rates providing >95% control up to 12 WAT.

No phytotoxicity was observed on Kentucky bluegrass plants at any time after the early postemergence applications of mesotrione. However, at 1 and 2 WAT, severe phytotoxicity (4 rating) was observed on creeping bentgrass patches growing in various plots. Slight phytotoxicity (8 rating) was observed on Kentucky bluegrass plants 1 week after the late postemergence mesotrione application. This phytotoxicity was not uniform across the plot, appearing on only a small portion of bluegrass plants and was temporary, disappearing in less than one week. Overall, Kentucky bluegrass appeared tolerant of mesotrione applications.

Table 1. Mesotrione rates and application timing effects on postemergence crabgrass control.

Mesotrione (lb ai/acre)	Timing	Application Timing			
		2 WAT	4 WAT	8 WAT	12 WAT
		% crabgrass control ¹			
Control		108a ²	130a	96a	95a
0.2	EA Post ³	18b	36b	26b	28bc
0.25	EA Post	18b	39b	25bc	32b
0.3	EA Post	14b	34b	24bc	26bc
0.5	EA Post	6b	20b	7cd	11cd
0.45 + prodiamine	EA Post	14b	29b	16bcd	25bc
0 (no fertilizer)	EA Post	143a	172a	86a	88a
0.2	EA and LA Post	25b	30b	17bcd	14bcd
0.25	EA and LA Post	13b	12b	4d	4d
0.3	EA and LA Post	16b	12b	3d	4d
0.5	EA and LA Post	7b	1b	1d	1d

¹The percentage of weed control taken 2 and 4 WAT represents the number of crabgrass plants/plot. Values for 8 and 12 WAT represent the percentage of crabgrass cover/plot.

²Means within columns followed by the same letter are not different according to Fisher's LSD_{0.05}.

³The early postemergence application was made June 6, 2005, and plots receiving a late postemergence application were treated again on July 5, 2005.