

Mesotrione: Evaluate Fertilizer Granule Formulations for Post Crabgrass Control

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Introduction

Research was conducted to determine: 1) what rate of mesotrione provides acceptable (>80%) weed control, 2) if these rates are non-phytotoxic to turfgrasses, 3) if the addition of proflumicafone 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 uniformly interseeded with crabgrass seed. Soil type was a Nicollet (fine-loamy, mixed, mesic-Aquic Hapludolls) with 8 ppm P, 60 ppm K, 2.4% organic matter, and a pH of 7.5. All turf was regularly irrigated and maintained at a 2 inch mowing height. The trial was arranged as a randomized complete block design with 3 replications. On 6 June 2005 mesotrione was applied at 0.2, 0.25, 0.3, 0.45, and 0.5 lb ai/A to crabgrass plants at tiller initiation. Four weeks later on 5 July 2005 four plots in each block received a second application of mesotrione at 0.2, 0.25, 0.3, and 0.5 lb ai/A.

Percentage crabgrass control was evaluated 2, 4, 8, and 12 weeks after treatment (WAT). In order to ensure validity of the recorded data percentage crabgrass control taken 2 and 4 WAT represents the number of crabgrass plants per plot whereas values for 8 and 12 WAT represent the percentage of crabgrass cover per plot. Turfgrass phytotoxicity was evaluated 1, 2, 3, and 4 weeks after each application on a scale of 1 to 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 difference (LSD) test. All tests of significance were made at $P \leq 0.05$.

Results

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 a fertilizer blank control (Table 1). Single mesotrione applications at 0.5 lb ai/A and mesotrione with proflumicafone at 0.45 lb ai/A provided > 80% crabgrass control. However, the application of Proflumicafone 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/A 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, 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 rate and application timing effect postemergence crabgrass control. The early postemergence application was made 6 June 2005 and plots receiving a late postemergence application were treated again on 5 July 2005.

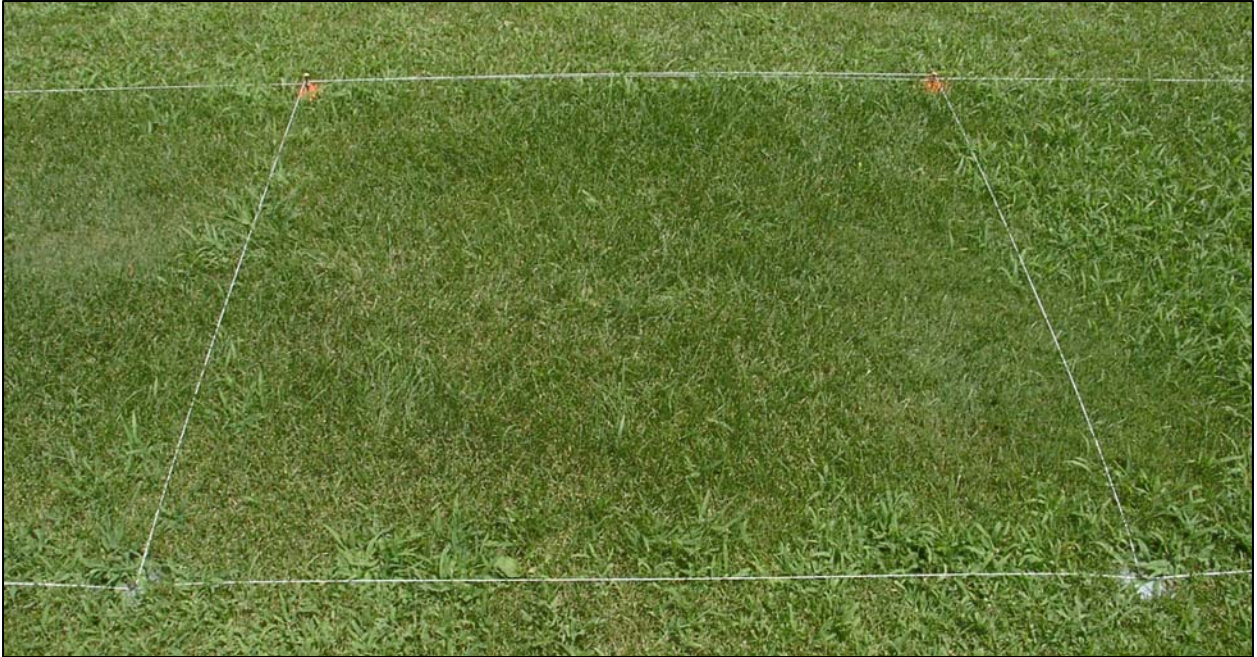
Mesotrione (lb ai/A)	Timing	Crabgrass control ^z			
		2 WAT	4 WAT	8 WAT	12 WAT
Control		108a ^y	130a	96a	95a
0.2	EA Post	18b	36b	26b	28bc
0.25	EA Post	18b	39b	25bc	32b
0.3	EA Post	14b	34b	24bc	26bc
0.5	EA Post	6b	20b	7cd	11cd
0.45 + Prodiamine	EA Post	14b	29b	16bcd	25bc
0 (fertilizer blank)	EA Post	143a	172a	86a	88a
0.2	EA & LA Post	25b	30b	17bcd	14bcd
0.25	EA & LA Post	13b	12b	4d	4d
0.3	EA & LA Post	16b	12b	3d	4d
0.5	EA & LA Post	7b	1b	1d	1d

^z Percentage weed control taken 2 and 4 WAT represents the number of crabgrass plants per plot. Values for 8 and 12 WAT represent the percentage of crabgrass cover per plot.

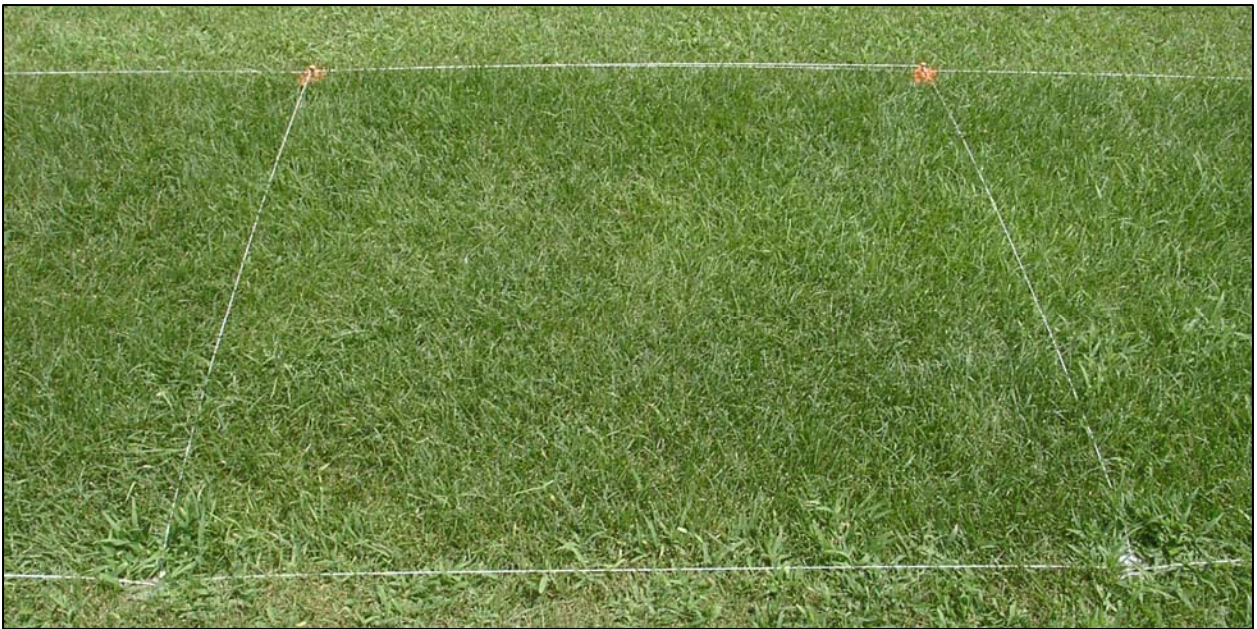
^y Means within columns followed by the same letter are not different according to Fisher's LSD_{0.05}.



Untreated control plots displaying crabgrass populations. Picture taken 7/21/2005.



Plot receiving early postemergence application of mesotrione at 0.2 lb ai/A. Picture taken 7/21/2005, 6 weeks after initial application.



Plot receiving early and late postemergence application of mesotrione at 0.2 lb ai/A. Picture taken 7/21/2005, 6 weeks after initial application.