

Mesotrione: Bentgrass Removal in Cool-Season Turfgrass

Zac Reicher and Dan Weisenberger

Background/Objective:

Other studies have shown mesotrione has potential to remove creeping bentgrass selectively from other species. The objectives of this study are to 1) determine the rate required to selectively remove creeping bentgrass and 2) determine if sequential applications are required.

Site Information

Location:	W.H. Daniel Research and Diagnostic Center
Soil Type:	Starks-Fincastle silt loam
Soil pH:	7.2
Soil Organic Matter (%):	
Turfgrass Species:	Creeping bentgrass
Turf Condition:	Good
Turf Management:	
Mowing Height cm (in):	1.3 (0.5)
Fertilization:	3 lbs N/1000 ft ² /yr
Irrigation:	To prevent moisture stress
Testing on Site Previous Year:	None
Target Pest:	Creeping bentgrass
Growth Stage:	Mature

Application Information

Application Date:	8 June	9 July	12 August
Application Time:	8:30am	9:30am	8:30am
Air Temperature C⁰(F⁰):	26.3 (79)	22.2 (72)	14.2 (58)
Relative Humidity(%):	77	72	65
Wind Speed m s⁻¹ (mph):	0.8-1.8 (2-4)	0.8-1.8 (2-4)	1.3-2.2 (3-5)
Soil Temperature(7.6 cm depth) C⁰(F⁰):	22.2 (72)	22.8 (73)	15.6 (60)
Soil Moisture:	moist	moist	moist
Spray Volume L ha⁻¹ (gal 1000 ft⁻²):	814 (2)		
Spray Pressure:	35psi		
Spray Nozzle:	8001.5		
Spray Equipment:	CO ₂ backpack		
Irrigation After Application:	None		
Experimental Design:	Randomized complete block		
Replications:	3		
Plot Size m (ft):	1.5 X 1.5 (5 X 5)		

Results:

Mesotrione was not highly effective in reducing long-term bentgrass cover in this study, even in spite of the addition of the extra sequential application that we made on 12 August in many of the treatments.

The following conclusions can be drawn from data up to Aug 6:

- Little difference in short-term control was seen between the NIS or MSO. (Table 1).
- Single applications of mesotrione were less effective than multiple applications. On 20 July, 2 applications of mesotrione at 0.125 or 0.187 lbs ai/A plus MSO produced 71.7 and 43.3% cover, respectively. Single applications at 0.125 or 0.187 lbs ai/A plus MSO produced 95.7 and 96.0% cover on July 20, respectively.
- Four week application intervals with mesotrione are too far apart to be effective. In an immediately adjacent study, mesotrione at 0.166 lbs ai/A applied three times at two or three week intervals exceeded the control seen with three applications on 4 week intervals.

The following conclusions can be drawn from data on Aug 19 through 30 Sep:

- The sequential application made on Aug 12 injured creeping bentgrass significantly, but it mattered little if it was the second application (9 weeks after the most recent application) or the third application ((4 weeks after the most recent application). This reinforces that the 4 week interval between applications is too long.

In yet another study adjacent to this one, treatments were watered in immediately after application with 0.5" of water. Though all treatments damaged creeping bentgrass, treatments allowed to dry on the leaf provided better control than those watered-in immediately after application. This indicates that even though mesotrione can be partially absorbed by the roots, leaf uptake is more effective and mesotrione should be applied when it can dry on the leaf.

Table 1. Percent cover^a of green creeping bentgrass following applications of mesotrione.

Treatment	Rate of application	22 June	9 July	20 July	6 Aug	19 Aug	1 Sept	30 Sept
	lb a.i./A	-----%-----						
Mesotrione 4SC + NIS ^b	0.125	95.0	98.0	97.3	97.7	97.7	18.3	51.7
Mesotrione 4SC ^c + NIS	0.375							
Mesotrione 4SC + NIS	0.187	86.7	93.7	94.7	98.0	97.7	6.7	55.0
Mesotrione 4SC ^c + NIS	0.313							
Mesotrione 4SC + NIS	0.25	75.0	91.7	93.3	96.3	97.3	30.0	70.0
Mesotrione 4SC ^c + NIS	0.25							
Mesotrione 4SC + NIS	0.125	88.3	96.3	68.3	90.3	94.3	36.7	70.0
Mesotrione 4SC ^d + NIS	0.125							
Mesotrione 4SC ^c + NIS	0.25							
Mesotrione 4SC + NIS	0.187	85.0	96.0	56.7	86.7	94.0	40.0	63.3
Mesotrione 4SC ^d + NIS	0.125							
Mesotrione 4SC ^c + NIS	0.187							
Mesotrione 4SC + NIS	0.187	80.0	96.0	33.3	76.7	91.7	35.0	71.7
Mesotrione 4SC ^d + NIS	0.187							
Mesotrione 4SC ^c + NIS	0.125							
Mesotrione 4SC + MSO ^e	0.125	86.7	97.7	96.0	97.3	97.3	100.0	97.0
Mesotrione 4SC + MSO	0.187	86.7	97.0	95.7	97.7	97.3	98.3	96.7
Mesotrione 4SC + MSO	0.25	76.7	94.0	91.7	96.3	97.0	98.3	97.3
Mesotrione 4SC + MSO	0.125	88.3	96.3	71.7	93.7	96.0	96.7	96.0
Mesotrione 4SC ^d + MSO	0.125							
Mesotrione 4SC + MSO	0.187	88.3	96.0	73.3	90.0	95.7	96.7	97.0
Mesotrione 4SC ^d + MSO	0.125							
Mesotrione 4SC + MSO	0.187	85.0	95.0	43.3	80.0	92.0	93.3	96.3
Mesotrione 4SC ^d + MSO	0.187							
Check		99.0	99.0	99.0	98.7	97.7	98.3	96.7
LSD (0.05)		12.1	NS	12.1	6.5	NS	19.1	19.5

^a Percent of the plot area covered by creeping bentgrass.^b Non-ionic surfactant (NIS) was included at 0.25% volume:volume.^c Sequential applications were made on 12 August, 9 weeks after the first application.^d Sequential application were made on 9 July, 4 weeks after initial application.^e Methylated seed oil (MSO) was included at 1.0% volume:volume.