Postemergence Control of Creeping Bentgrass with Fall Applications of MON 44951

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Background/Objective:

Creeping bentgrass is known to encroach collars, roughs, and other golf course sites where it is unwanted. The objective of this study is to evaluate the technical fit of fall applications of MON 44951 for selective postemergence control of creeping bentgrass from Kentucky bluegrass.

Site Information

Location:	W.H. Daniel Research and Diagnostic Center	
Soil Type:	Starks-Fincastle silt loam	
Soil pH:	7.2	
Soil Organic Matter (%):	NA	
Turfgrass Species:	Creeping bentgrass	Kentucky bluegrass
Turf Condition:	Good	Good
Turf Management:		
Mowing Height cm (in):	1.3 (0.5)	6.4 (2.5)
Fertilization:	3 lbs N/1000 ft^2/yr	3 lbs N/1000 ft^2/yr
Irrigation:	To prevent moisture stress	
Testing on Site Previous Year:	None	None
Target Pest:	Creeping bentgrass	
Growth Stage:	Mature	

Application Information

Application Date:	Oct 2	Oct 16	Oct 30
Application Time:	9:30 AM	9:30 AM	8:30 AM
Air Temperature $C^o(F^o)$:	10.1 (50)	12.2 (54)	11.6 (53)
Relative Humidity(%):	44	64	68
Wind Speed m s^{-1} (mph):	2.2 (5)	0.9 (2)	3.1 (7)
Soil Temperature(7.6 cm depth) $C^o(F^o)$:	7.8 (46)	11.1 (52)	7.8 (46)
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:

- Single applications of MON 44951 caused significant phytotoxicity to creeping bentgrass and reduction of cover measured 14 Nov, especially at rates above 0.5 oz/A (Table 1).
- However, there was little long term control of creeping bentgrass from these single applications made on Oct 2 (Table 1).
- Control of creeping bentgrass measured in April 2004, was improved by adding a sequential application on Oct 16 (Table 1).
- Control of creeping bentgrass measured in April 2004, was dramatically improved by adding a second sequential application on Oct 30 (Table 1).
- Almost all treatments caused some phytotoxicity to Kentucky bluegrass and phytotoxicity increased with rate of MON 44591 and number of sequential applications (Table 1).
- Most of the phytotoxicity on the Kentucky bluegrass resulted from the application of MON 44951 on 16 Oct and the phytotoxicity was not increased by applying the second sequential application on 31 Oct (Table 1).
- Trying to strike a compromise between reduction in creeping bentgrass and tolerable phytotoxicity to Kentucky bluegrass, three applications of MON 44951 at 0.25 oz/A appears to be the best choice from this study.
- For aggressive creeping bentgrass removal, these data suggest that 3 applications of MON 44951 at 0.75 oz/A should be used.
- We ran a concurrent study on L93 mowed at 1.5 inches. In that study, single applications of MON 44951 at 0.25 and 0.5 oz/A applied on 16 Oct or 23 Oct reduced L93 creeping bentgrass by 30% compared to the control by Apr 2004. These applications caused only marginal and generally acceptable phytotoxicity. It's difficult to compare these two studies, but an application in mid-Oct followed by a late Oct sequential could give adequate control with only minor phytotoxicity.

Table 1. Response of 'L93' creeping bentgrass and 'America' Kentucky bluegrass to fall applications of MON 44951.

			L93 Creeping bentgrass				America Kentucky bluegrass			
			Phytotoxicity[a]		Cover[b]		Phytotoxicity[a]			Cover[b]
Treatment	Rate of application	Application timing[c]	16 Oct	31 Oct	14 Nov	13 Apr	16 Oct	31 Oct	14 Nov	13 Apr
					-------%-------					--%--
MON 44951[d]	0.25[e]	2 Oct	6.0	6.0	85.0	99.0	7.3	8.3	9.0	99.0
MON 44951	0.5	2 Oct	5.3	4.7	63.3	99.0	6.7	7.0	8.3	99.0
MON 44951	0.75	2 Oct	5.0	3.3	36.7	97.3	6.3	6.0	7.7	99.0
MON 44951	1.5	2 Oct	4.7	3.7	20.0	93.0	6.0	6.0	6.7	99.0
MON 44951 MON 44951	0.25 0.25	2 Oct 16 Oct	5.7	4.0	25.0	95.0	7.3	6.7	5.7	99.0
MON 44951 MON 44951	0.5 0.5	2 Oct 16 Oct	5.3	3.0	11.7	85.0	6.7	5.7	4.7	99.0
MON 44951 MON 44951	0.75 0.75	2 Oct 16 Oct	5.0	2.7	5.0	73.3	6.3	6.3	4.3	94.3
MON 44951 MON 44951	1.5 1.5	2 Oct 16 Oct	4.0	2.0	3.3	20.0	6.0	4.7	3.7	83.3
MON 44951 MON 44951 MON 44951	0.25 0.25 0.25	2 Oct 16 Oct 30 Oct	5.7	4.0	8.3	50.0	8.0	7.0	5.7	95.7
MON 44951 MON 44951 MON 44951	0.5 0.5 0.5	2 Oct 16 Oct 30 Oct	6.0	4.0	7.3	21.7	6.7	6.0	4.7	83.3
MON 44951 MON 44951 MON 44951	0.75 0.75 0.75	2 Oct 16 Oct 30 Oct	4.3	2.3	4.0	6.7	7.0	6.0	4.3	81.7
Check			9.0	9.0	98.3	99.0	9.0	9.0	9.0	99.0
LSD (0.05)			1.2	1.0	8.9	6.9	1.1	1.7	1.2	5.4

[a] Phytotoxicity was rated on a scale of 1 to 9 where 1 = completely brown turf, 7 = acceptable turf, and 9 = no phytotoxicity.
[b] Percent of the plot covered by creeping bentgrass or Kentucky bluegrass.
[c] Date treatment was applied.
[d] All applications included the surfactant MON 0818 at 0.25% volume/volume.
[e] Application rate was oz product/A