Mestrione 4SC Safety when Applied at Seeding and Newly-Emerged Kentucky Bluegrass
Zac Reicher and Dan Weisenberger

Background/Objective: In past university trials Mesotrione has shown efficacy on broadleaf weeds. Mesotrione timing of application needs to be determined in conjunction with seeding new turf stands. The objective of this study is to determine safety of mesotrione at day of seeding and on newly emerged turf.

Site Information

Location:	William H. Daniel Research and Diagnostic Center
Soil Type:	Starks-Fincastle silt loam
Soil pH:	7.2
Turfgrass Species:	'SR2284', 'Langara', 'Kingfisher',and 'Odyssey' Kentucky bluegrass blend
Turf Condition:	NA
Mowing Height cm (in):	6.4 (2.5)
Fertilization:	1.5# P_2O_5 9 May using 6-24-24 1.0# P_2O_5 30 May using 6-24-24 0.75# N 22 June using 25-5-15
Irrigation:	To prevent moisture stress
Testing on Site Previous Year:	none
Target Pest:	Safety
Growth Stage:	seeding to mature
Seeding Date	9 May
Emergence	28 May

Application Information

	At seeding	+ 3 weeks	1st mow	+ 3 weeks	2nd mow	+ 3 weeks
Application Date:	9 May	30 May	23 June	10 July	28 June	17 July
Application Time:	12:30 p.m.	9:00 a.m.	1:30 p.m.	9:00 a.m.	9:30 a.m.	8:30 a.m.
Air Temperature C^{o}(F^{o}):	21.7 (71)	24.7 (76)	26 (79)	23.2 (74)	22 (72)	24.1 (75)
Relative Humidity(%):	45	73	54	74	66	78
Wind Speed m s^{-1} (mph):	2.2 (5)	1.1 (2.5)	1.8 (4)	0.4 (1)	1.8 (4)	calm
Soil Temperature(7.6 cm depth) C^{o}(F^{o}):	21.1 (70)	22.2 (72)	28.9 (84)	22.2 (72)	21.1 (70)	24.4 (76)
Soil Moisture:	dry	moist	moist	moist	moist	moist
Spray Volume L ha^{-1} (gal 1000 ft^{-2}):	814 (2)					
Spray Pressure:	30psi					
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:

- Initial applications on day of seeding had no effect on Kentucky bluegrass that germinated about 3 weeks after application (Table 1).
- However, split applications made three weeks after the initial application caused significant injury which lasted for 2-3 weeks. These applications were made to only 2-4 day old seedlings . As expected, 0.25+0.25 lbs ai/A was more damaging than 0.187+0.187 lbs ai/A.
- Applications made immediately after the first mowing also caused injury, but this injury lasted less than one week.
- Applications made immediately after the second mowing were not injurious..
- Sequential applications made after the first or second mowing were not injurious.
- In spite of visible injury, there was no decrease in density from any of the treatments as rated on June 30 (Table 2). From these results, our recommendation is to apply mesotrione at seeding of Kentucky bluegrass or after the second mowing.

Table 1. Injury[a] to seedling Kentucky bluegrass with herbicides applied at seeding or shortly after emergence.

Treatment[b]	Rate of application	7 June	12 June	23 June	30 June	6 July	27 July
	lb ai/A						
Day of seeding (9 May)							
Mesotrione 4SC	0.187	9.0	9.0	9.0	9.0	9.0	9.0
Mesotrione 4SC	0.25	9.0	9.0	8.7	9.0	9.0	9.0
Mesotrione 4SC	0.187	9.0	8.7	8.0	9.0	9.0	9.0
Mesotrione 4SC[c]	0.187						
Mesotrione 4SC	0.25	6.7	8.3	7.3	9.0	9.0	9.0
Mesotrione 4SC[c]	0.25						
Siduron 50WP	6.0	9.0	9.0	9.0	9.0	9.0	9.0
Check		9.0	9.0	8.7	9.0	9.0	9.0
1st mowing (22 June)							
Mesotrione 4SC	0.187	-	-	-	8.3	9.0	9.0
Mesotrione 4SC	0.25	-	-	-	7.7	9.0	9.0
Mesotrione 4SC	0.187	-	-	-	8.3	9.0	9.0
Mesotrione 4SC[c]	0.187						
Mesotrione 4SC	0.25	-	-	-	8.0	9.0	9.0
Mesotrione 4SC[c]	0.25						
Siduron 50WP	6.0	-	-	-	8.7	9.0	9.0
Check		-	-	-	9.0	9.0	9.0
2nd mowing (27 June)							
Mesotrione 4SC	0.187	-	-	-	-	9.0	9.0
Mesotrione 4SC	0.25	-	-	-	-	9.0	9.0
Mesotrione 4SC	0.187	-	-	-	-	9.0	9.0
Mesotrione 4SC[c]	0.187						
Mesotrione 4SC	0.25	-	-	-	-	9.0	9.0
Mesotrione 4SC[c]	0.25						
Siduron 50WP	6.0	-	-	-	-	9.0	9.0
Check		-	-	-	-	9.0	9.0
LSD (0.05)		0.2	0.3	NS	0.6	NS	NS

[a] Injury was rated on a scale of 1 to 9 where 1 = total white and/or brown, 7 = acceptable damage, and 9 = no injury.
[b] Mesotrione treatment included NIS at 0.25 percent volume per volume.
[c] Indicates a second application three weeks later.

Table 2. Density[a] of Kentucky bluegrass after herbicides applied at seeding or shortly after emergence.

Treatment[b]	Rate of application	23 June
	lb ai/A	
Day of seeding (9 May)		
Mesotrione 4SC	0.187	7.0
Mesotrione 4SC	0.25	6.3
Mesotrione 4SC	0.187	5.0
Mesotrione 4SC[c]	0.187	
Mesotrione 4SC	0.25	5.0
Mesotrione 4SC[c]	0.25	
Siduron 50WP	6.0	5.7
Check		6.3
1st mowing (22 June)		
Mesotrione 4SC	0.187	6.3
Mesotrione 4SC	0.25	5.0
Mesotrione 4SC	0.187	6.3
Mesotrione 4SC[c]	0.187	
Mesotrione 4SC	0.25	7.3
Mesotrione 4SC[c]	0.25	
Siduron 50WP	6.0	6.7
Check		6.3
2nd mowing (27 June)		
Mesotrione 4SC	0.187	6.0
Mesotrione 4SC	0.25	5.3
Mesotrione 4SC	0.187	6.7
Mesotrione 4SC[c]	0.187	
Mesotrione 4SC	0.25	7.0
Mesotrione 4SC[c]	0.25	
Siduron 50WP	6.0	6.7
Check		6.3
LSD (0.05)		NS

[a] Plot density was rated on a scale of 1 to 9 where 9 = maximum density.
[b] Mesotrione treatment included NIS at 0.25 percent volume per volume.
[c] Indicates a second application three weeks later.