

Mesotrione 4SC safety to perennial ryegrass when applied to seeding and newly emerged turf
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Background/Objective: Mesotrione has shown efficacy on broadleaf weeds in past university trials. 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: | ‘SR4350’ perennial ryegrass |
| Turf Condition: | NA |
| Turf Management: | Mowing Height cm (in): 6.4 (2.5) |
| | Fertilization: 1.5# P ₂ O ₅ 9 May using 6-24-24 |
| | 1.0# P ₂ O 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 | 20 May |

Application Information

| | At seeding | +3 weeks | 1 st mow | +3 weeks | 2 nd mow | +3 weeks |
|---|---------------------------|-----------|---------------------|-----------|---------------------|-----------|
| Application Date: | 8 May | 30 May | 6 June | 24 June | 28 June | 10 July |
| Application Time: | 4:45pm | 9:00am | 10:00am | 1:30pm | 9:30am | 9:00am |
| Air Temperature C⁰(F⁰): | 26.4(80) | 24.7 (76) | 25.6 (78) | 26 (79) | 22 (72) | 23.2 (74) |
| Relative Humidity(%): | 28 | 73 | 42 | 54 | 66 | 74 |
| Wind Speed m s⁻¹ (mph): | 0.9 (2) | 0.9 (2) | 1.3 (3) | 1.8 (4) | 1.8 (4) | 0.4 (1) |
| Soil Temperature(7.6 cm depth) C⁰(F⁰): | 21.1 (70) | 22.2 (72) | 22.2 (72) | 28.9 (84) | 21.1 (70) | 22.2 (72) |
| 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 perennial ryegrass that germinated about 12 days after application (Table 1).
- However, split applications made three weeks after the initial application caused significant injury which lasted until 22 June. These applications were made to only 10 day old perennial ryegrass.
- Applications made immediately after the first mowing also caused injury, but this injury lasted about two weeks.
- Sequential applications made after the first mowing extended the injury compared to a single application.
- Applications made immediately after the second mowing also caused injury, but this injury lasted about two weeks.
- Sequential applications made after the second mowing did not extend injury in this study, but data were not recorded between 6 and 27 July when injury may have been seen.
- In spite of visible injury, there was no decrease in density from any of the treatments as rated on June 30.
- From these results, our recommendation is to apply a single application of mesotrione at the time of seeding for the least negative effect on perennial ryegrass. Similar phytotoxicity could be expected from applications made 10 days after emergence or at the first or second mowing, but no long-term thinning would be expected from these applications. In areas of heavy crabgrass pressure, applications of mesotrione could begin as early as 10 days after emergence of perennial ryegrass in spring.

Table 1. Injury to and percent cover of perennial ryegrass after applications of mesotrione or Drive at or shortly after seeding.

| Treatment | Rate of application | Injury ^a | | | | | | Cover 30 June |
|-----------------------------|---------------------|---------------------|---------|---------|---------|--------|---------|---------------|
| | | 7 June | 12 June | 22 June | 30 June | 6 July | 27 July | |
| | a.i./A | | | | | | | % |
| Day of seeding | | | | | | | | |
| Mesotrione 4SC ^b | 0.187 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 99 |
| Mesotrione 4SC | 0.25 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 99 |
| Mesotrione 4SC | 0.187 | 3.7 | 7.0 | 8.3 | 9.0 | 9.0 | 9.0 | 99 |
| Mesotrione 4SC ^d | 0.187 | | | | | | | |
| Mesotrione 4SC | 0.25 | 3.0 | 6.7 | 8.3 | 9.0 | 9.0 | 9.0 | 99 |
| Mesotrione 4SC ^d | 0.25 | | | | | | | |
| Siduron 50WP | 6.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 99 |
| Drive 75DF | 0.75 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 99 |
| Check | | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 99 |
| 1 st mowing | | | | | | | | |
| Mesotrione 4SC | 0.187 | - | 6.3 | 8.3 | 9.0 | 9.0 | 9.0 | 99 |
| Mesotrione 4SC | 0.25 | - | 5.7 | 7.3 | 9.0 | 9.0 | 9.0 | 99 |
| Mesotrione 4SC | 0.187 | - | 7.3 | 7.7 | 9.0 | 8.7 | 9.0 | 99 |
| Mesotrione 4SC ^d | 0.187 | | | | | | | |
| Mesotrione 4SC | 0.25 | - | 5.3 | 7.0 | 8.7 | 7.0 | 9.0 | 99 |
| Mesotrione 4SC ^d | 0.25 | | | | | | | |
| Siduron 50WP | 6.0 | - | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 99 |
| Drive 75DF ^c | 0.75 | - | 9.0 | 9.0 | 9.0 | 8.7 | 9.0 | 99 |
| Check | | - | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 99 |
| 2 nd mowing | | | | | | | | |
| Mesotrione 4SC | 0.187 | - | - | - | 8.0 | 7.7 | 9.0 | 99 |
| Mesotrione 4SC | 0.25 | - | - | - | 7.7 | 7.0 | 9.0 | 99 |
| Mesotrione 4SC | 0.187 | - | - | - | 7.3 | 8.0 | 9.0 | 99 |
| Mesotrione 4SC ^d | 0.187 | | | | | | | |
| Mesotrione 4SC | 0.25 | - | - | - | 7.7 | 7.3 | 9.0 | 99 |
| Mesotrione 4SC ^d | 0.25 | | | | | | | |
| Siduron 50WP | 6.0 | - | - | - | 9.0 | 9.0 | 9.0 | 99 |
| Drive 75DF ^c | 0.75 | - | - | - | 8.3 | 8.3 | 9.0 | 99 |
| Check | | - | - | - | 9.0 | 9.0 | 9.0 | 99 |
| LSD (0.05) | | 0.2 | 1.1 | 0.6 | 0.8 | 0.6 | NS | NS |

^a Injury was rated on a scale of 1 to 9 with 1 = totally white tissue, 7 = acceptable injury and 9 = no injury.

^b Mesotrione 4SC applications included NIS at the rate of 0.25% v/v.

^c Drive 75DF applications at 1st mowing and 2nd mowing included MSO at the rate of 1% v/v.

^d Indicates a split application with the second application being 3 weeks later.