

Overseeding Creeping Bentgrass Before or After Application of MON44951

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Background/Objective:

MON 44951 has shown tremendous promise for control of *Poa trivialis* in creeping bentgrass. However, if *Poa trivialis* is effectively controlled, seeding creeping bentgrass may be necessary to fill in holes left by *Poa trivialis*. Understanding limitations in seeding before or after application of MON 44951 is required to maximize seeding success.

Site Information

| | |
|---------------------------------------|--|
| Location: | William H. Daniel Research and Diagnostic Center |
| Turfgrass Species: | 'Penncross' creeping bentgrass |
| Turf Condition: | Good |
| Turf Management: | |
| Mowing Height in: | 0.5 |
| Fertilization: | NA |
| Irrigation: | To prevent moisture stress |
| Testing on Site Previous Year: | None |
| Target Pest: | NA |
| Growth Stage: | Various |

Application Information

| | | | | |
|---|---------------------------|--------|---------|---------|
| Application Dates: in 2004 | 2 Aug | 10 Aug | 16 Aug | 23 Aug |
| Application Dates: in 2004 | 1 Sept | 9 Sept | 14 Sept | 23 Sept |
| Spray Volume gal 1000 ft⁻²: | 2 | | | |
| Spray Equipment: | CO ₂ backpack | | | |
| Experimental Design: | Randomized complete block | | | |
| Replications: | 3 | | | |
| Plot Size ft: | 5 X 5 | | | |

Results:

- This study was designed as a 3 X 7 factorial, but it has not been fully analyzed as a factorial since this is still preliminary data.
- MON 44951 caused no phytotoxicity to the Penncross creeping bentgrass when applied between 3 WBS and 1 WAE (Table 1).
- MON 44951 applied 2, 3 and 4 WAE caused visible phytotoxicity, but this lasted for two weeks or less.
- MON 44951 at 0.25 lbs ai/A was the safest application and only applications at 0 WBS, 1, 2, or 3 WAE reduced creeping bentgrass cover measured on 28 Oct (Table 2).
- MON 44951 at 0.50 and 1.0 lbs ai/A reduced creeping bentgrass cover measured on 28 Oct regardless of the application date (Table 2).

Table 1. Phytotoxicity^a to ‘Penncross’ creeping bentgrass seedlings after application of MON 44951 before or after seeding.

| Treatment ^b | Rate of application | Application timing ^c | 14 Sept | 23 Sept | 30 Sept | 7 Oct | 17 Oct | 22 Oct |
|------------------------|---------------------|---------------------------------|---------|---------|---------|-------|--------|--------|
| | lb ai/A | | | | | | | |
| MON 44951 | 0.25 | 3 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.5 | 3 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 1 | 3 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.25 | 2 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.5 | 2 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 1 | 2 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.25 | 1 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.5 | 1 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 1 | 1 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.25 | 0 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.5 | 0 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 1 | 0 WBS | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.25 | 1 WAE | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.5 | 1 WAE | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 1 | 1 WAE | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.25 | 2 WAE | 7.0 | 8.0 | 8.3 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.5 | 2 WAE | 5.7 | 5.0 | 6.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 1 | 2 WAE | 5.7 | 3.0 | 1.3 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.25 | 3 WAE | 9.0 | 7.3 | 7.7 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.5 | 3 WAE | 9.0 | 6.3 | 7.0 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 1 | 3 WAE | 9.0 | 6.0 | 5.7 | 9.0 | 9.0 | 9.0 |
| MON 44951 | 0.25 | 4 WAE | 9.0 | 9.0 | 8.3 | 7.3 | 9.0 | 9.0 |
| MON 44951 | 0.5 | 4 WAE | 9.0 | 9.0 | 7.3 | 5.3 | 9.0 | 9.0 |
| MON 44951 | 1 | 4 WAE | 9.0 | 9.0 | 7.3 | 3.7 | 9.0 | 9.0 |
| Check | | | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 | 9.0 |
| LSD (0.05) | | | 0.5 | 0.9 | 1.4 | 0.6 | NS | NS |

^a Phytotoxicity was rated on a scale of 1 to 9 where 1 = completely brown turf, 7 = acceptable damage, and 9 = no phytotoxicity.

^b All treatments included MON 0818 at 0.25%v/v.

^c Weeks before seeding (WBS) and weeks after emergence (WAE) of creeping bentgrass.

Table 2. Percent cover^a of 'Penncross' creeping bentgrass seedlings after application of MON 44951 before or after seeding.

| Treatment ^b | Rate of application | Application timing ^c | 14 Sept | 23 Sept | 30 Sept | 7 Oct | 17 Oct | 22 Oct | 28 Oct |
|------------------------|---------------------|---------------------------------|---------|---------|---------|-------|--------|--------|--------|
| | lb ai/A | | | | | | | | |
| MON 44951 | 0.25 | 3 WBS | 48.3 | 88.3 | 87.3 | 94.7 | 97.3 | 96.0 | 95.0 |
| MON 44951 | 0.5 | 3 WBS | 17.3 | 45.0 | 46.7 | 58.3 | 58.3 | 68.3 | 73.3 |
| MON 44951 | 1 | 3 WBS | 8.3 | 7.7 | 11.7 | 16.7 | 25.0 | 30.0 | 41.7 |
| MON 44951 | 0.25 | 2 WBS | 21.7 | 55.0 | 65.0 | 78.3 | 90.0 | 86.7 | 85.0 |
| MON 44951 | 0.5 | 2 WBS | 10.0 | 13.3 | 23.3 | 33.3 | 41.7 | 53.3 | 56.7 |
| MON 44951 | 1 | 2 WBS | 3.3 | 1.7 | 2.0 | 2.3 | 4.3 | 8.0 | 11.7 |
| MON 44951 | 0.25 | 1 WBS | 18.3 | 45.0 | 48.3 | 66.7 | 81.7 | 81.7 | 83.3 |
| MON 44951 | 0.5 | 1 WBS | 3.0 | 3.0 | 4.7 | 3.7 | 6.7 | 11.7 | 16.7 |
| MON 44951 | 1 | 1 WBS | 0.0 | 0.0 | 0.0 | 1.0 | 0.7 | 1.0 | 2.3 |
| MON 44951 | 0.25 | 0 WBS | 2.0 | 3.7 | 6.7 | 6.7 | 11.7 | 18.3 | 26.7 |
| MON 44951 | 0.5 | 0 WBS | 0.3 | 0.0 | 1.0 | 0.7 | 1.0 | 3.0 | 4.0 |
| MON 44951 | 1 | 0 WBS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| MON 44951 | 0.25 | 1 WAE | 0.7 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 1.0 |
| MON 44951 | 0.5 | 1 WAE | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| MON 44951 | 1 | 1 WAE | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| MON 44951 | 0.25 | 2 WAE | 73.3 | 55.0 | 38.3 | 43.3 | 55.0 | 65.0 | 68.3 |
| MON 44951 | 0.5 | 2 WAE | 70.0 | 21.7 | 6.0 | 8.3 | 10.0 | 18.3 | 25.0 |
| MON 44951 | 1 | 2 WAE | 71.7 | 9.0 | 1.3 | 2.0 | 1.3 | 2.7 | 4.3 |
| MON 44951 | 0.25 | 3 WAE | 78.3 | 68.3 | 46.7 | 46.7 | 60.0 | 60.0 | 65.0 |
| MON 44951 | 0.5 | 3 WAE | 85.0 | 76.7 | 30.0 | 25.0 | 33.3 | 38.3 | 50.0 |
| MON 44951 | 1 | 3 WAE | 86.7 | 73.3 | 11.7 | 11.7 | 13.3 | 16.7 | 18.3 |
| MON 44951 | 0.25 | 4 WAE | 85.0 | 97.0 | 94.3 | 88.3 | 96.3 | 94.7 | 96.0 |
| MON 44951 | 0.5 | 4 WAE | 85.0 | 96.7 | 92.0 | 65.0 | 51.7 | 68.3 | 70.0 |
| MON 44951 | 1 | 4 WAE | 85.0 | 95.3 | 91.7 | 41.7 | 25.0 | 31.7 | 41.7 |
| Check | | | 83.3 | 97.7 | 96.7 | 98.0 | 99.0 | 98.3 | 98.0 |
| LSD (0.05) | | | 10.6 | 19.3 | 17.7 | 22.3 | 23.1 | 23.3 | 24.7 |

^a Percent of the plot area covered by bentgrass.

^b All treatments included MON 0818 at 0.25%v/v.

^c Weeks before seeding (WBS) and weeks after emergence (WAE) of creeping bentgrass.