

Biological Control of Dollar Spot on Annual Bluegrass

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Within the past couple of years there have been significant advances in the understanding and use of the biological control organism Tx-1 (*Pseudomonas aureofaciens*). This has led to its growing use as a tool in managing dollar spot (*Sclerotinia homoeocarpa*) on turfgrass. The treatments in this study were designed to help further our understanding of Tx-1 and increase its effectiveness as a biological control for dollar spot.

One part of this study aims to identify if daily applications of Tx-1 in conjunction with a single fungicide application can prolong the effectiveness of the fungicide. To test if this is possible a treatment of Tx-1 applied daily with a single fungicide application will be compared to a treatment of only the fungicide. A treatment of Tx-1 applied daily will also be compared to these treatments.

Tx-1 is thought to control dollar spot by producing an antibiotic called PCA which inhibits the growth of the pathogen. It is not certain whether the active Tx-1 or the antibiotic itself is responsible for inhibition of dollar spot. To identify if the living Tx-1 or the antibiotic is responsible for inhibition we will compare daily treatments of living Tx-1, boiled Tx-1, and a non-PCA producing mutant of Tx-1. Living Tx-1 will be applied daily at a specific rate, the same application will be made with Tx-1 which have been boiled. By boiling the Tx-1, the organism is killed however the same amount of PCA is applied as is being applied by the living Tx-1 treatment. A laboratory generated mutant of Tx-1 was created which does not produce PCA. In the lab this mutant still inhibits the growth of dollar spot similar to the non-mutant Tx-1. The results from the field treatment of this mutant will indicate if there are other antibiotics or factors which may be responsible for inhibition of dollar spot.

<u>Treatments</u>	<u>Rate</u>	<u>Application Interval</u>
1. Tx-1	2×10^7 CFU/cm ²	5 days/week
2. Tx-1	2×10^7 CFU/cm ²	1 time/week
3. Control		
4. Daconil Ultrex + Tx-1	3.8 oz/1000 ft ² 2×10^7 CFU/cm ²	Applied once 5 days/week
5. Daconil Ultrex	3.8 oz/1000 ft ²	Applied once
6. Banner + Tx-1	1 oz/1000 ft ² 2×10^7 CFU/cm ²	Applied once 5 days/week
7. Banner	1 oz/1000 ft ²	Applied once
8. Tx-1, 8 hr. Growth	1×10^7 CFU/cm ²	5 days/week
9. Boiled Tx-1	2×10^7 CFU/cm ²	5 days/week
10. Tx-1, Mutant	2×10^7 CFU/cm ²	5 days/week