Evaluation of Fungicides for Managing Dollar Spot Disease with Multi-Class Resistance in a Mixed Fairway Stand of Creeping Bentgrass and Annual Bluegrass on a Golf Course in Barnstaple, MA, 2025

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Dollar spot caused by the fungus *Clarireedia jacksonii* is a destructive disease of turf grass that thrives in cool wet conditions. It appears as round sunken patches of blighted turf that mature to the size of a silver dollar. This report evaluates the efficacy of commercial fungicides to control dollar spot that has shown multi-class fungicide resistance in a mixed fairway stand in Barnstaple, MA. A field trial was conducted at the Wianno Golf Club during the summer of 2025. Results showed fungicides Densicor, Ascernity, and Posterity provided near-total control of dollar spot under wet coastal conditions. The results offer guidance for turf managers seeking treatment options in the coastal New England region.

A field product evaluation trial was performed in the summer of 2025 at Wianno Golf Club in Barnstable, MA, located less than a mile from the Atlantic Coast. The fairway has been in use since 1916 and was established on a sandy loam. The objective of the trial was to evaluate the efficacy of single curative fungicide applications for the recovery or control of dollar spot disease (caused by *Clarireedia jacksonii*) in a mixed stand of creeping bentgrass and annual bluegrass. Prior to the trial, dollar spot isolates from the site were assayed for sensitivity to five major fungicide classes: demethylation inhibitor (DMI), succinate dehydrogenase inhibitor (SDHI), dicarboximide, benzimidazole, and fluazinam. Mycelial plugs were plated on potato dextrose agar (PDA; 39 g of PDA and 1 liter of water) amended with one of the following: 1 ppm Iprodione; 1,000 ppm thiophanate-methyl; .01 ppm fluazinam; 1 ppm of the DMI fungicide propiconazole; or 1,000 ppm of the SDHI fungicide penthiopyrad. The experiment utilized a randomized block design with three blocks. Each block consisted of 17, 3- by 6-ft. plots established where existing disease pressure was consistently high. Thirteen commercially available fungicide products, applied across 16 treatments, were tested using a CO_2-pressurized boom sprayer equipped with two XR TeeJet 8004 VS nozzles set at 40 psi. Eleven fungicides were applied following label instructions, while Posterity and Maxtima, both with dose ranges, were tested at their lower and higher recommended rates. Each block also included an untreated control. Applications were made on 16 July 2025, following a week with two consecutive days of heavy rainfall, 1 day of light rain, and recurrent fog. Disease severity was assessed on 26 July using a 0 to 10 scale, where 0 indicated no visible disease and 10 indicated uncontrolled active disease progression. All observed symptoms, characterized by the typical bleached appearance, were attributed to dollar spot. A Shapiro-Wilke test was performed to assess data normality ($P > 0.0001$), and the null hypothesis of normal distribution was rejected. Consequently, a nonparametric Kruskal-Wallis test was used to evaluate treatment effects, which was implemented with the R base package stats (v4.5.1).

Isolates isolated prior to the trial were insensitive to the DMI propiconazole, resistant to iprodione, showed mixed sensitivity to T-methyl, and were sensitive to both fluazinam and the SDHI penthiopyrad. The overall treatment effect of the field trial was not statistically significant ($P = 0.189$); however, several treatments differed notably from the control. Of the 16 treatments evaluated, eight notably reduced disease severity compared with untreated plots. Specifically, Densicor, Ascernity, Secure, T-Methyl, Posterity, and Maxtima suppressed disease effectively. Posterity was effective at both the high and low ends of its recommended dose range, while Maxtima provided greater control at the lower dose. Notably, Densicor, Ascernity, and Posterity provided near-total curative control of dollar spot under wet coastal conditions in the presence of multi-fungicide-resistant populations. While the in vitro and field results were generally aligned, the assays demonstrated limitations of using a single fungicide as a representative of its chemical class due to complex cross-resistance mechanisms. For example, the DMI fungicide prothioconazole performed well both alone (Densicor) and in combination with an SDHI (Ascernity), in contrast to propiconazole and other DMIs tested in the field (mefentrifluconazole, tebuconazole, propiconazole, and flutriafol), which showed inconsistent or poor performance. Field and in vitro results for the SDHI class were also largely consistent, except with Velista (penthiopyrad), which showed variable performance across replicates. Both iprodione and fluazinam demonstrated effective curative control in vitro and in the field. Interestingly, although T-Methyl showed variable results in vitro, it performed well under field conditions, providing effective control of dollar spot under trial conditions (Supplementary Table S1).

Keywords: cool-season turfgrass, DMI, dollar spot, resistance, SDHI

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***e*-Xtra:** Supplementary material is available online.

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Supplementary Table S1. Evaluation of curative fungicide treatments for managing a dollar spot population with confirmed multiclass fungicide resistance on a golf course fairway (mean ± standard deviation, $n = 3$).

Treatment and rate per 1,000 sq. ft. (active ingredient)	**Disease severity rating**[z]
Untreated control	7 ± 2.6
Posterity 0.08 fl. oz. (pydiflumetofen)	0.3 ± 0.6
Posterity 0.32 fl. oz.	1 ± 1.7
Maxtima 0.2 fl. oz. (mefentrifluconazole)	0.7 ± 1.2
Maxtima 0.8 fl. oz.	1.7 ± 1.5
Torque 0.6 fl. oz. (tebuconazole)	4.7 ± 3.5
ProtectMAX Propiconazole 0.77 fl. oz. (propiconazole)	3.6 ± 4.6
Velista 0.5 fl. oz. (penthiopyrad)	2 ± 1.7
T-Methyl 4-5 0.46 fl. oz. (thiophanate-methyl)	1 ± 1
Chipco 3 fl. oz. (iprodione)	1.6 ± 0.6
Posterity XT 1.5 fl. oz. (pydiflumetofen + azoxystrobin + propiconazole)	2 ± 2
Rayora 0.7 fl. oz. (flutriafol)	1.7 ± 2.1
Secure 0.5 fl. oz. (fluazinam)	0.7 ± 1.2
Densicor 0.196 fl. oz. (prothioconazole)	0.3 ± 0.6
Kalida 0.25 fl. oz. (fluindapyr + flutriafol)	3 ± 1.7
Ascernity 1 fl. oz. (benzovindiflupyr + difenoconazole)	0.3 ± 0.6

[z] The disease severity rating was a 0 to 10 scale, where 0 indicated no visible disease and 10 indicated uncontrolled disease progression.