

Evaluate fungicide efficacy to control dollar spot when applied with various adjuvants on a creeping bentgrass golf tee, 2023

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Plant Disease Management Reports briefly describe the ongoing results of field trials. This report covers:

CREEPING BENTGRASS (*Agrostis stolonifera* unknown cultivar(s))

Dollar Spot; *Claviceps jacksonii*

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A fungicide study was conducted using unknown cultivar(s) of creeping bentgrass on a golf range tee at North Shore Country Club, in Glenview, IL, a suburb of Chicago, IL. The objective was to evaluate if two different, commonly used spray adjuvants could improve dollar spot control by an acropetal penetrant (a.i. = iprodione; Chipco GT) or a contact (a.i. = chlorothalonil; Daconil Action) site-of-action fungicide. The range tee was mowed at 0.500 in. height every other day with no fertilizer applied during the study period. Individual plot size was 4 ft × 6 ft and were arranged in a randomized complete block design with four replications. Treatments were applied using a CO₂ backpack boom sprayer with three XR TEEJET 8004VS nozzles delivered at 40 psi in water equivalent to 2.0 gal per 1000 sq ft. Treatments were applied twice on 31 Jul and 28 Aug at a 28-day interval; the fungicides were applied alone and also applied individually as a tank-mix with each adjuvant. From 31 Jul to 15 Sep, data was taken once or twice a week for visual quality (data not shown), NDVI, and dollar spot. Dollar spot was evaluated visually for disease severity and recorded as percent of turfgrass plot area affected. Area under the disease progress curve (AUDPC) for dollar spot was calculated using the trapezoidal integration method. Data were subjected to analysis of variance using Fisher's protected least significance difference test at $p \leq 0.05$.

Dry conditions were experienced much of June, with regular periods of rainfall thereafter. Dollar spot development occurred from Jul to Sep. Dollar spot was present at study start on 31 Jul but was $\leq 10\%$ plot area affected which was deemed acceptable at this site. In untreated plots, dollar spot severity was unacceptable ($> 10\%$) by 25 Aug and would peak on 15 Sep (37.5%). Of fungicides tested, only Chipco GT provided consistent dollar spot control compared to untreated. For example, AUDPC analysis across all 14 dates rated found two 28-day interval applications of Chipco GT could provide dollar spot control with or without adjuvants. In contrast, AUDPC analysis found two 28-day interval applications of Daconil Action required a spray adjuvant for dollar spot control (Table 1).

Chipco GT + Adjuvants. The acropetal penetrant fungicide Chipco GT applied alone or tank-mixed with adjuvants provided consistent and acceptable dollar spot control. Regardless of adjuvant use, dollar spot severity remained $\leq 10\%$ on all 14 rating dates and no differences were observed among treatments of Chipco GT alone, Chipco GT + SYNC, or Chipco GT + Penn-A-Trate.

Daconil Action + Adjuvants. The contact fungicide Daconil Action experienced 3 of 14 rating dates with unacceptable dollar spot severity. In contrast, Daconil Action + SYNC resulted in dollar spot $\leq 10\%$ on all rating dates, and Daconil Action + Penn-A-Trate exceeded 10% only once. Adjuvants did not improve dollar spot control by Daconil Action, but their addition did increase the likelihood that dollar spot severity would remain within an acceptable threshold of $\leq 10\%$. Overall, the addition of adjuvants showed a trend of improved Daconil Action efficacy during peak dollar spot activity.

Table 1. Evaluate fungicide efficacy on dollar spot when applied twice with various adjuvants on a creeping bentgrass golf tee.

Application strategy/treatment rate per 1000 sq ft	Spray interval (days)	NDVI				Dollar spot severity (%) ^w				Dollar spot summary (14 dates)	
		5-Sep _x	8-Sep	11-Sep	15-Sep	5-Sep	8-Sep	11-Sep	15-Sep	AUDPC ^y	Percentage of dates \leq 10% _z
Untreated	--	0.73a	0.73b	0.74b	0.66b	11.2a	13.7a	30a	37.5a	152.1a	57%
Chipco GT 3 fl oz	28	0.74a	0.76a	0.78a	0.73a	1.7b	1.2bc	1.7b	3b	42.7b	100%
Chipco GT 3 fl oz + SYNC 0.367 fl oz	28	0.74a	0.77a	0.78a	0.73a	0.7b	0.2c	0.7b	1.2b	27.8b	100%
Chipco GT 3 fl oz + Penn-A-Trate 0.367 fl oz	28	0.72a	0.76a	0.77a	0.73a	1b	1.5bc	1.7b	4.5b	47b	100%
Chipco GT 3 fl oz + Penn-A-Trate 0.737 fl oz	28	0.73a	0.76a	0.78a	0.73a	0.7b	1bc	1.2b	2.7b	44.8b	100%
Daconil Action 4 fl oz	28	0.72a	0.77a	0.79a	0.72a	9a	8.5b	16.2b	17.5b	102.5ab	79%
Daconil Action 4 fl oz + SYNC 0.67 fl oz	28	0.73a	0.76a	0.78a	0.74a	5ab	3.7bc	7.5b	10b	62.1b	100%
Daconil Action 4 fl oz + Penn-A-Trate 0.367 fl oz	28	0.73a	0.76a	0.79a	0.72a	6.5ab	6.5bc	8.2b	15b	68.5b	93%
Daconil Action 4 fl oz + Penn-A-Trate 0.737 fl oz	28	0.74a	0.77a	0.80a	0.74a	5.2ab	3.2bc	8.7b	10.7b	56.5b	93%

^v Normalized difference vegetation index using handheld cropping sensor GreenSeeker by Trimble Inc. represent the mean of four replications.

^w Percent plot area affected with dollar spot represent the mean of four replications.

^x Means followed by the same letter in a column are not significantly different using Fisher's protected least significance difference test at $p \leq 0.05$.

^y Area under the disease progress curve (AUDPC) was calculated from 31 Jul to 15 Sep and used 14 rating dates.

^z Percentage of 14 rating dates in which mean dollar spot disease severity was within an acceptable threshold (less than or equal to 10% per plot) which was deemed acceptable at this site.