Interseeding practices for conversion of golf fairways to bentgrass cultivars with enhanced dollar spot resistance

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Botany and Plant Pathology

Introduction

Dollar spot, caused by *Clarideedia* spp., is the predominant disease on creeping bentgrass used on golf fairways. Multiple fungicide applications per annum are often necessary for control, equating to high costs and potential development of fungicide resistance. Several cultivars with improved dollar spot resistance have been released, however their widespread adoption by golf superintendents is hindered by the risk and cost of complete renovation.

Hypothesis

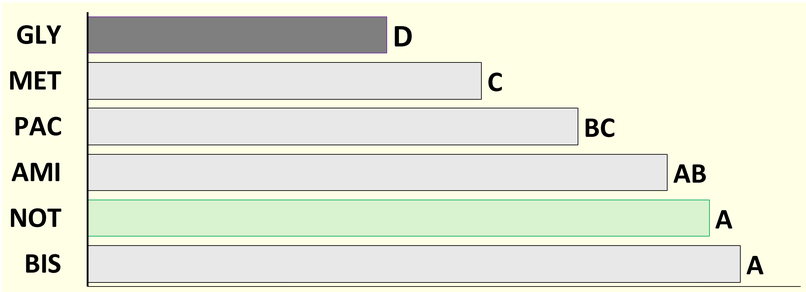
Interseeding dollar spot resistant cultivars into fairway height bentgrass will reduce dollar spot severity and fungicide use.

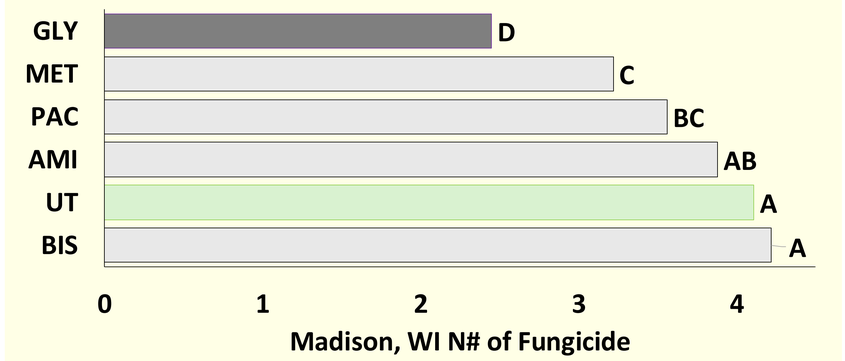
Methods

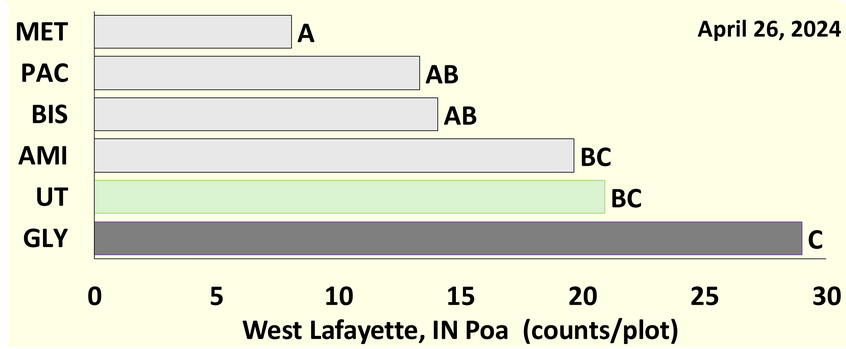
- Three partially resistant cultivars (007 XL, Pure Select, Coho) were slit seeded at 97.65kg/ha into a susceptible bentgrass cultivar under five herbicide/PGR treatments (see Table 1) in July 2023 at three locations (IN, PA, WI).
- Treatments arranged in a split block design with cultivar as the main plot and herbicide/PGR program and fungicide application as sub plots.
- In 2024, one half of the subplots was treated with a fungicide at 14-day intervals based on a threshold of five-dollar spot infection centers per plot.
- Poa counts conducted during Poa seedhead flush (GDD22) and disease rated weekly with visual count of infection centers or estimates of disease severity using digital imaging.
- Data subjected to ANOVA with PROC GLIMMIX in SAS. Where applicable LSmeans were separated with Fishers Protected LSD (*P*< 0.05).

Results

Glyphosate vs Interseeding







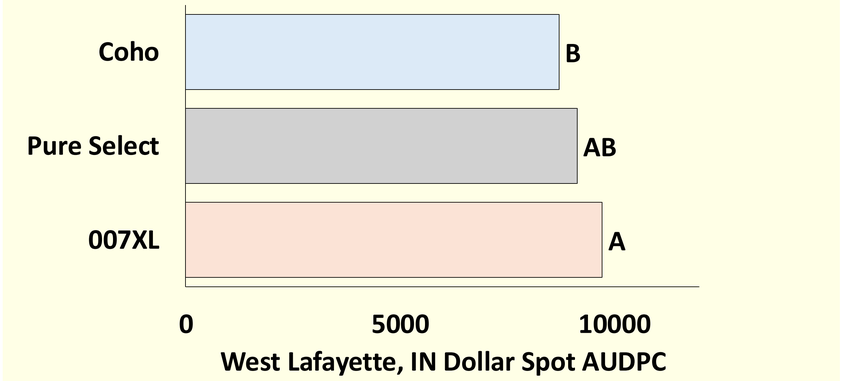
Columns with the same letter are not significantly different according to Fisher's Protected LSD (P = 0.05).

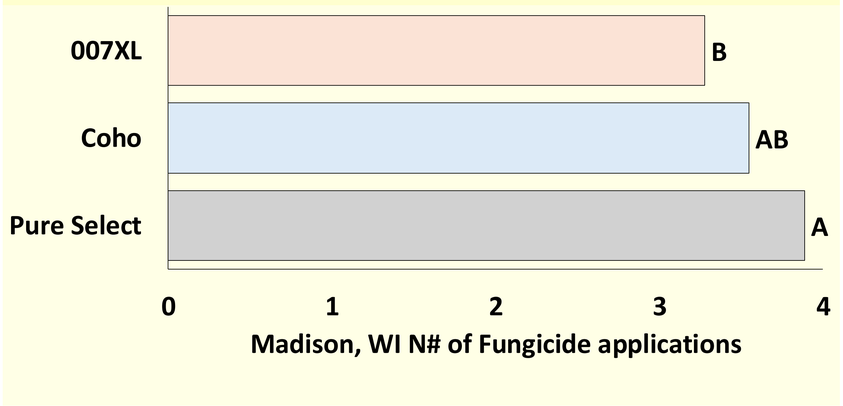
Analysis of variance indicating significant sources of variation

		West Lafayette, IN[3]			*Madison, WI*	
Factor[1]	**df**	**AUDPC**[2]	**Fung**	**Poa**	**AUDPC**	**Fung**
Cultivar	2	*	NS	NS	NS	*
Herbicide/PGR	5	NS	NS	**	*	***
Cult x Herb/PGR	10	NS	NS	NS	NS	NS

[1]Location significantly influenced AUDPC ($p < 0.001$), necessitating separate analyses for each location
[2]AUDPC (Area Under Disease progress Curve), Fung (Fungicide), Poa (Annual Bluegrass Flower Count)
[3]Significant main effects or interactions ($p < 0.05$*, 0.001** and 0.0001***)

Cultivar choice





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Vredo Turf-Fix 25" interseeding study plots at W.H. Daniel Turfgrass Research & Diagnostic Center, Purdue University

Table 1. Herbicide/PGR program

Herb./PGR	Abbrv.	Timing*	Rate (kg /ha
Amicarbazone	AMI	21 & 7 DBS	0.21
Bispyribac sodium	BIS	14 DBS & 30 DAS	0.22 & 0.11
Methiozolin	MET	45 DBS & 84 DAS	0.084
Paclobutrazol	PAC	14 DBS & 42 DAS	1.12
Glyphosate	GLY	14 & 7 DBS	3.36
Untreated	UT		

*DAS – Days After Seeding; DBS – Days Before Seeding

Conclusions

- Reducing dollar spot severity lowers fungicide use, though Herbicide/PGR effectiveness and cultivar performance vary by region.
- Choice of Herbicide /PGR program does not impact bentgrass cultivars' susceptibility to dollar spot.
- Combining interseeding with a selective herbicide (methiozolin,bispyribac-sodium) or PGR (paclobutrazol) can effectively reduce Poa invasion.

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