



Dollar Spot

Sclerotinia homoeocarpa
(latin name will probably change)
(Ascomycete)

high impact

2



Dollar Spot disease triangle

PATHOGEN
Sclerotinia homoeocarpa

TURF SPECIES
All common warm and cool season turfgrasses

DISEASE TRIANGLE

ENVIRONMENT: 15-30 C, leaf wetness (10 hrs), excess thatch, drought stress & low N

4



Dollar Spot on *Agrostis stolonifera* (CB)

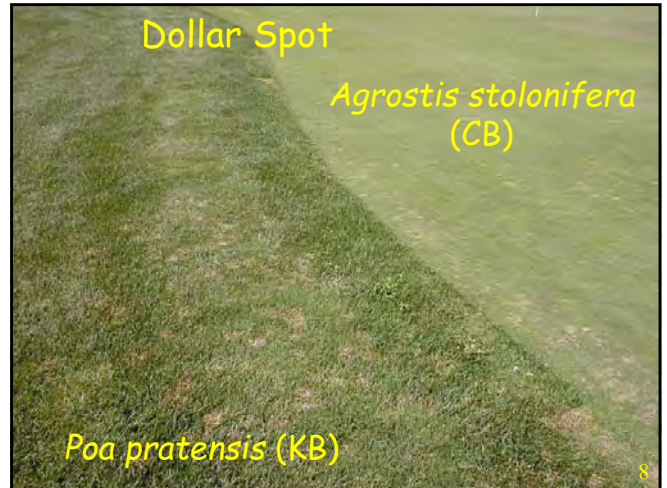


7

Dollar Spot

Agrostis stolonifera
(CB)

Poa pratensis (KB)



8

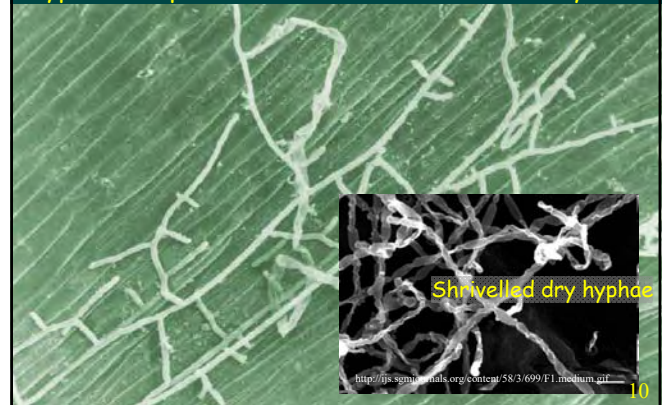
Dollar Spot: Control

- 1) Leaf Wetness
 - reduce shade/less pm watering/whipping+poling
- 2) Plant Health
 - minimize thatch/reduce compaction/avoid drought stress/increase mowing heights+rolling
- 3) Nitrogen
 - increase N to outgrow disease
- 4) Cultivars & Species
 - some cultivars more susceptible
- 5) Fungicides & Composts & Teas....

9

1. Leaf wetness & infection

Hyphae on epidermal cells under 100% humidity



Shrivelled dry hyphae

<http://ijs.sgmjournals.org/content/58/2/699/F1.medium.gif>

10

S. homoeocarpa Creeping bentgrass

- hyphae stained blue growing on leaf surface looking to infect (Rioux et al. 2011, ASA)

Wounded creeping bentgrass leaves hyphae enter plant cells by 8 hours of leaf wetness (Orshinsky et al. 2010)

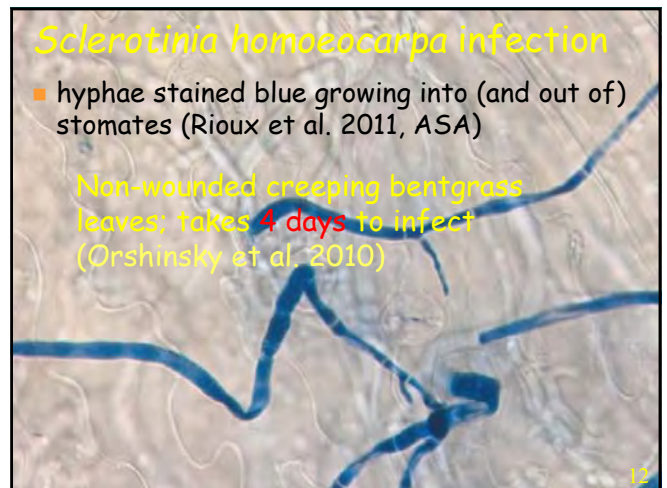


11

Sclerotinia homoeocarpa infection

- hyphae stained blue growing into (and out of) stomates (Rioux et al. 2011, ASA)

Non-wounded creeping bentgrass leaves; takes 4 days to infect (Orshinsky et al. 2010)



12

2. Thatch & plant vigor

(<http://www.agronomics.co.uk/img/pages/11.jpg>)

- harbours & feeds pathogens
- restricts water flow
- binds pesticides & fertilizers
- non-productive tissues



13

3. Nitrogen to outgrow symptom



14

4. Dollar spot resistance

- see NTEP trials
- Less susceptible
 - L-93, A-1, Providence and Pennlinks
- More susceptible - no CB fully resistant
 - Putter, Emerald, Forbes 80-12, SR-1020, Penneagle, Penncross, Century and Crenshaw
 - » Crenshaw was released in Texas for superior heat tolerance

15

5. Dollar Spot control trials



16

5a. Dollar Spot: Fungicides (out of 4)

- propiconazole (Banner/QP) 4
- myclobutanil (Eagle) 4
- thiophanate-methyl (Senator/Proturf) 4
- boscalid (Cadence) 3.5
- triticonazole (Premis/Triton) 3.5
- iprodione (Rovral/QP) 3.5
- chlorothalonil (Daconil) 3
- pyraclostrobin (Insignia) 2.5
- mineral oil (Civitas) 2
- *Bacillus subtilis* (Rhapsody) 1

17

5b. Dollar Spot compost trials



18

Turf Disease Research: Sugar with your tea & canola? (funded by Ontario Turfgrass Research Foundation)

Tom Hsiang

Lynn Tian, Sandra Cook, Yijun Yang
Dept. Environmental Biology
University of Guelph

19

Turf Disease Home Remedies

- affect competitor microorganisms?
- direct effects on turf growth?
- direct effects on disease-causing organism?
 - ⇒ sugars (molasses)
 - ⇒ stimulate competitors & turf?
 - ⇒ peroxides
 - ⇒ sterilize leaf surfaces?
 - ⇒ compost teas (soaking composts)
 - ⇒ microbial and N effects?

20

Summer 2004 Compost Teas tested

COMPOST	SOURCE
Cattle manure	Canadian Tire
Sheep manure	Canadian Tire
Turkey manure	Nutrite
Mushroom compost	Nutrite
Topdressing	Hillview Farms

21

Cattle manure compost



22

Sheep manure compost



23

Turkey manure compost



24

Mushroom compost



25

Topdressing with organic matter



26

Brewing Tea



27

Brewing Tea (bubbling)



Liquid strained out and further diluted (1:2 or 1:5)

28

Compost Teas - Microbial Colonies

Compost	Yeast	Bacteria	Fungi
Cattle manure	63	0	0
Sheep manure	7	4	1
Turkey manure	10	2	0
Mushroom compost	118	12	0
Topdressing	76	4	0



7-day old tea, 0.0001 ml spread over petri plate, after 5 days at 25C

29

Summer 2004 Treatments

- Hydrogen peroxide (1% and 3%)
 - lightly sterilizing foliar surfaces
 - found in commercial products such as Zerotel®
- Molasses (1% and 5%)
 - food for antagonists (enemies) to fungal diseases
- Treatments applied on GTI pathology greens
 - 2 rates weekly from June - Sept 2004
 - dollar spot counted weekly

30



Field Test Results (spots per 0.25 m² plot)

TREATMENT	Dollar Spot Disease Suppression	
	High Rate	Low Rate
Cattle manure	63% (26 spots)	63% (26 spots)
Sheep manure	70% (21 spots)	63% (26 spots)
Turkey manure	72% (20 spots)	49% (36 spots)
Mushroom compost	85% (11 spots)	58% (30 spots)
Topdressing	66% (24 spots)	49% (36 spots)
Molasses (Black Strap)	32% (48 spots)	25% (53 spots)
Peroxide (domestic/Zehrs)	38% (44 spots)	31% (49 spots)
Daconil	86% (10 spots)	
Untreated (Inoculated)	71 spots	

LSD=30 (p=0.05)

33

- ### Future Work
- more concentrated molasses?
 - commercial formulations of peroxide (e.g. hydrogen dioxide is suppose to be more stable and more active)?
 - better fermentation procedures for teas (times and temperatures)?
 - more work with mushroom composts?
 - mechanism of suppression?
- 34