Utilizing a Diagnostic Service

to Dial in Sports Turf Disease Management Programs

2020 STMA Conference
West Palm Beach, Florida

UF UNIVERSITY of FLORIDA
IFAS Extension
Rapid Turfgrass Diagnostic Service

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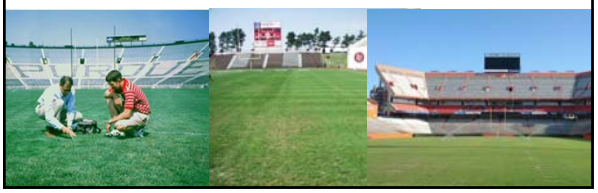
Objectives for today

- Why use a diagnostic service for turfgrass disease management?
  - What are some of the resource labs available?
- Using a service: sampling, images, communication with the lab
- Review what diseases we see through the UF Service
- and discuss management options



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Diagnosis of turf diseases

- Correct, complete diagnosis is important
- Some diseases are common
- Others can be difficult
- New cultivars, turf species, pathogens, unusual weather patterns all mean new diseases and disease symptoms

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Diagnosis is critical

- Management strategies differ significantly by disease
- Examples: dollar spot, Pythium
  - Different fertility recommendations
  - Pythium fungicides don't work for ds
- Sometimes the environment is to blame not a pathogen

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UF IFAS Extension

DISEASE TRIANGLE

Pat Sanders, Penn State University

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Disease causers: pathogens

- Fungi
- Bacteria
- Viruses
- Others

Sclerotinia homoeocarpa

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Main types of pathogens

- Fungi
- Bacteria- very few examples, none in FL
- Viruses- Sugarcane Mosaic Virus affects St. Augustinegrass in FL
  - St. Augustinegrass Decline (SAD, Panicum Mosaic Virus)
- Others- *Labyrinthula* sp. Affects Poa triv,...
  - Rapid blight
  - Marine slime mold relative

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How do I take a sample?

- For best results:
  - Take a sample as soon as you notice symptoms
    - Before fungicide is applied is better
  - Use a cup-cutter or cut a similar size plug (4.25")
    - Be sure to include roots, stolons, leaves
  - Take the sample from the edge of the symptom
    - Shoot for 2/3 diseased, 1/3 healthy border
  - Send the sample expedited (next day is best)
    - We are closed on weekends
  - Send an email and attach pics of the field signature
    - Address and forms are available at turf.ufl.edu

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What's a field signature?

- Patterns and perspectives
  - From the cart driving past the green
    - Shade, drainage lines, irrigation patterns
  - Walking up to the affected area
    - Edge effect/traffic, low spots, high spots, construction
  - Standing over the turf
    - Defined borders, edges, distribution of symptoms
  - At arm's length
    - Individual plants, oldest leaves, newest leaf, roots?

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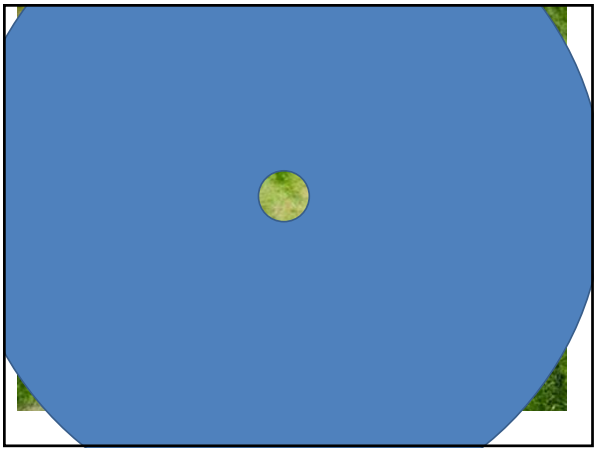

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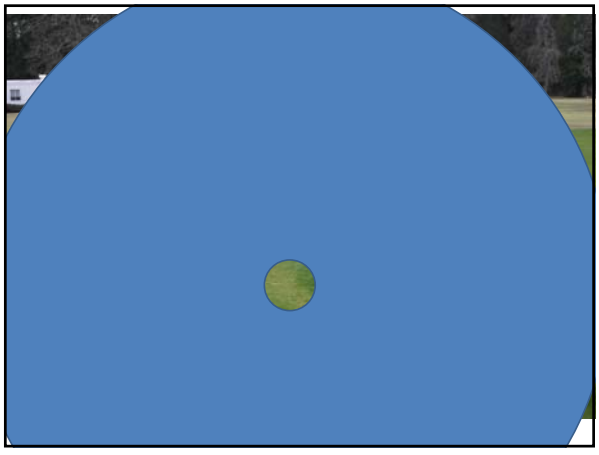

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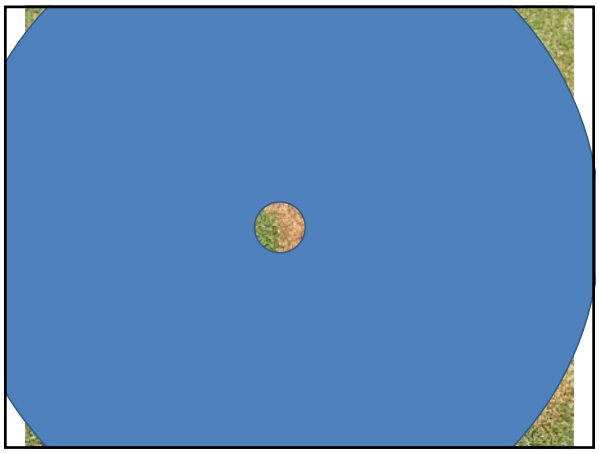

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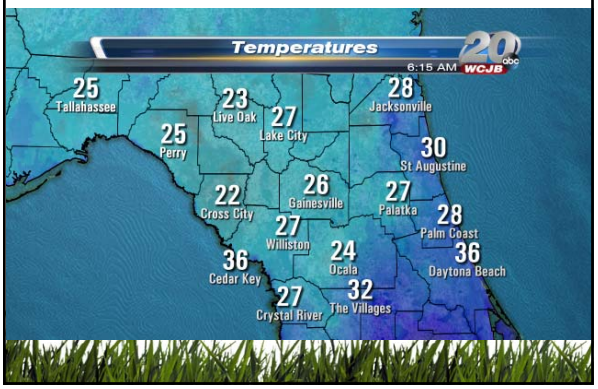
Friday 1/19/18



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What happens in the lab?

- We triage the sample
  - Signs are recorded
    - Evidence of a pathogen you can see outside the plant
  - Symptoms are noted, on which plant parts
    - Blight, spot, rot, yellowing, stunting, galling, etc.
  - Symptomatic turf plant parts are selected and plated on media
  - The rest of the sample is placed in a moist chamber

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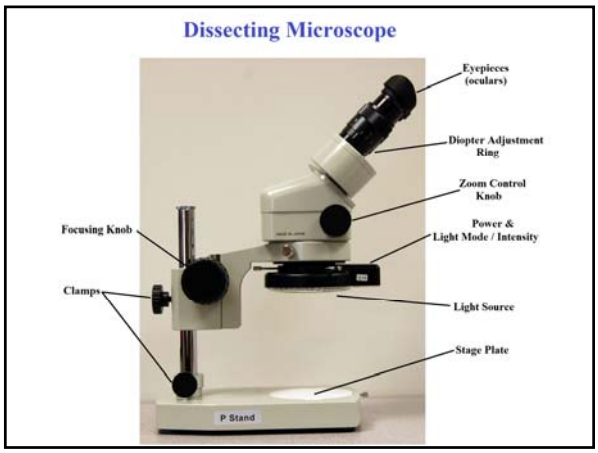

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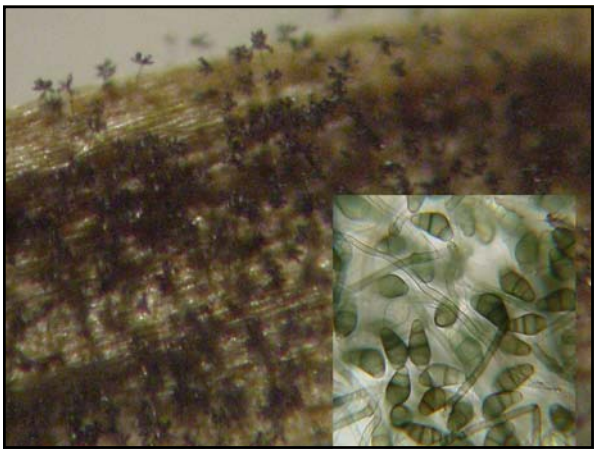

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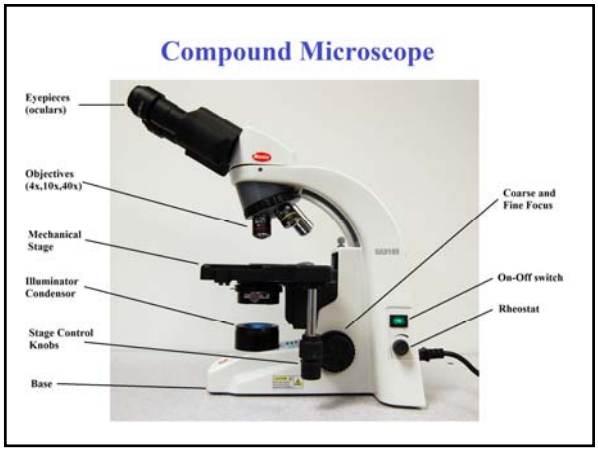

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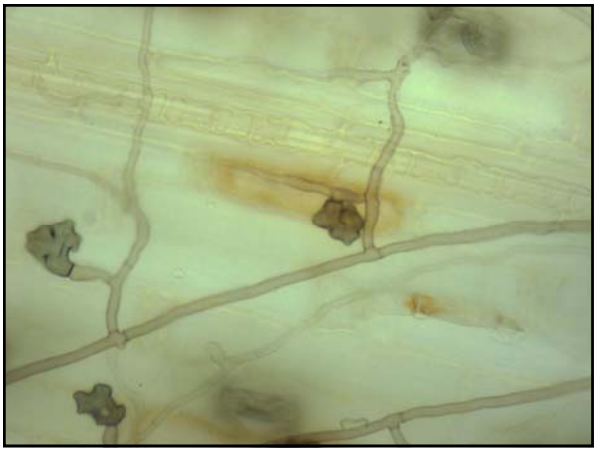

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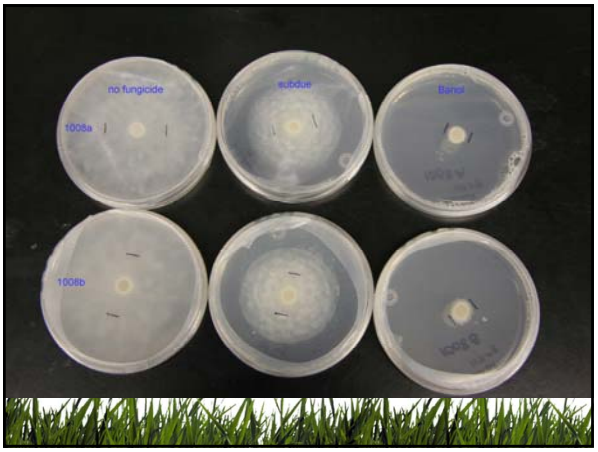

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How do we diagnose a turf disease?

A Five Step Process…

1. Determine that a 'REAL' problem exists.
2. Look for PATTERNS, in recent samples, in the community, on an individual plant and on an individual plant part.
3. IDENTIFY pathogens in the moist chamber and in the plates
4. Ask QUESTIONS.
5. SYNTHESIZE the information.

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Choosing a Lab

- University local to your region with a turf program. C3 vs C4, transition vs deep south
  - Likely to have knowledge of "Disease Happenings"
  - Subsidized in many cases means good value, not for profit
- Incubate and observe vs plate it out
  - When in doubt, plate it out.

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Excellent labs that aren't mine

- Rutgers Cooperative Extension, Dr. Bruce Clarke and Richard Buckley
- University of Wisconsin, Dr. Paul Koch and Kurt Hockemeyer
- Michigan State University, Dr. Joe Vargas and Ron Detweiler
- NC State Turf Diagnostic Lab, Dr. Jim Kerns and Lee Butler
- Mississippi State, Dr, Maria Tomaso-Peterson and Clarissa Balbalion
- University of Missouri, Dr. Lee Miller
- And more!

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"Hub" SPDN resource lab for the Southeast (1/5)
Surge capacity
$1.7 million built in 2012
Iso-based accreditation

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Diagnostic Services

- Offered within the state, US, and globally
- Provide accurate diagnoses in a timely manner
- Connect research driven management recs
- Clientele include:
  - Growers
  - Extension agents
  - Turfgrass managers
  - Nursery producers
  - Greenhouse managers
  - Pest control operators
  - Consultants
  - Citizens
  - Extension faculty
  - State and federal partners

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Rapid Turf Diagnostic Service

- Full time RTDS diagnostician
  - Max Duncan
- 2019 numbers: 923 samples
- Specific media and protocols
  - Rapid turnaround results
  - Research driven management options
  - Higher costs, higher fees

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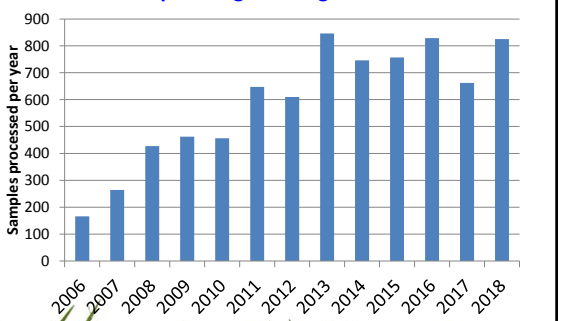
Rapid Turfgrass Diagnostic Service



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Rapid Turf States Served: 2012 to 2018

States	Counties	States (cont.)	Counties
AL	6	MO	1
AR	2	MS	5
AZ	2	NC	3
CA	4	NJ	1
FL	52	NV	1
GA	12	OH	1
HI	3	PA	1
IN	1	SC	1
LA	6	TN	6
MD	1	TX	11
		VA	3
		WV	1
	Total:		22

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Rapid Turf International Clients 2013-2018

Country	Area/state/city	Samples
Brazil	Rio de Janeiro	7
China	Hong Kong	6
China	Houje	9
Hong Kong	Lantau Island	61
Ireland	Limerick	4
Spain	Gran Canaria	1
Taiwan	New Taipei City	2
Vietnam	Danang city	2
Australia	Australia	6
Canada	Canada	4
Dominican Republic	Dominican Republic	10
Singapore	Singapore	237
	Total:	349

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2018 Rapid Turf Final Results

Bermudagrass

127	Pythium sp./spp.	*Pythium sp./spp. 32 blight, 27 root rot*
123	Bermudagrass Decline	*G. graminis var. graminis*
96	No Pathogen Found-Final	
46	Leaf and Sheath Spot	*"Rhizoctonia" zeae*
32	Suspected Nematode Damage	*Unknown*
28	Bipolaris leaf blotch/melting out	*Bipolaris sp.*
25	Curvularia leaf blight	*Curvularia spp.*
21	Algal Crust	
8	Microdochium blight/patch	*Microdochium sp.*
5	Large Patch	*Rhizoctonia solani*
5	Localized Dry Spot	
3	Black Layer	
3	Dollar Spot	*Sclerotinia homoeocarpa*
3	Hydrophobic Fairy Ring	
2	Insufficient Sample	
2	Pink Patch	*Limonomyces roseipellis*
2	Slime Mold (Myxomycota)	
2	Suspected Insect Damage	
1	Nigrospora blight	*Nigrospora sp./spp*
1	Superficial Fairy Ring	
535	**Total for Bermudagrass**	

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Zoysia 2018 Rapid Turf Results

Zoysia

31	Take-all root rot	*G. graminis var. graminis*
22	Curvularia leaf blight	*Curvularia spp.*
19	Pythium sp./spp.	*Pythium sp./spp.*
14	No Pathogen Found-Final	
7	Pythium Root Rot	*Pythium sp.*
6	Dollar Spot	*Sclerotinia homoeocarpa*
5	Bipolaris leaf spot	*Bipolaris sp.*
4	Large Patch	*Rhizoctonia solani*
3	Suspected Nematode Damage	*Unknown Unknown*
2	Microdochium	*Microdochium sp.*
1	Hydrophobic Fairy Ring	
1	Insufficient Sample	
1	Localized Dry Spot	
1	Rust	*Puccinia spp.*
1	Suspected Insect Damage	
1	Spring Dead Spot	*Ophiosphaerella korrae*
119	**Total for Zoysia**	

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Turf 2018

Seashore Paspalum

14	Curvularia leaf blight	*Curvularia spp.*
13	Take-all root rot	*G. graminis var. graminis*
9	Pythium sp./spp.	*Pythium sp./spp.*
6	No pathogen found-final	
5	Microdochium blight	*Microdochium paspali*
3	Southern blight	*Athelia (formerly Sclerotium) rolfsii*
3	Leaf and sheath spot	*Waitea circinata* varieties
1	Helminthosporium leaf spot	*Drechslera sp./spp.*
1	Large patch	*Rhizoctonia solani*
1	Suspected insect damage	
1	Suspected nematode damage	*Unknown*
60	**Total for Seashore Paspalum**	

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Take-all root rot
Bermudagrass decline

- Fungal diseases caused by *Gaeumannomyces graminis* var. *graminis* sometimes abbreviated G.g.g.
- Key diagnostics are yellow symptoms in spring and early summer and lobed hyphopodia on stolons
- Hyphopodia look like tiny black dots with dissecting 'scope, puzzle pieces with compound 'scope

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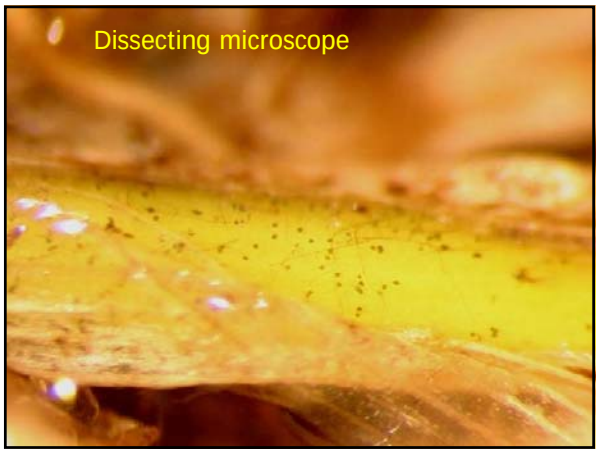

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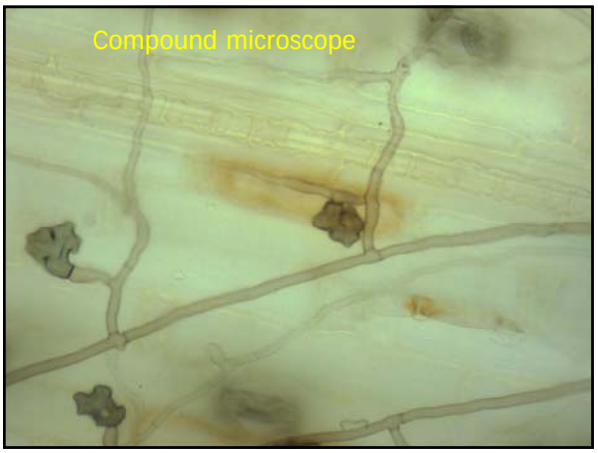

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Ggg Management

- Reduce stresses by following IFAS fertilizer, mowing, irrigation, and other agronomic recommendations
- Diseased turf will require extra care to maintain quality with damaged roots
- Recognize the micronutrient deficient symptom and get a disease sample tested early

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Ggg Management

- Have a soil test done
  - High pH favors disease, (if high) use acidifying fertilizers to lower pH
  - Symptoms of disease can be masked with micronutrients in fertilizer applications
  - “Spoon feed” grass with disease, the roots are damaged and can’t take up much soluble N

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Fungicide Efficacy

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7/18/13

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12/11/13

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Ggg Management

- Fungicides are not consistently effective after symptoms become apparent (curatively)
- Good coverage, lightly water apps in
- QoI's
- Among new SDHI's most have efficacy
- DMI's have efficacy, less phyto concern with sports fields

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Pythium root rot, Pythium blight

- Caused by many different *Pythium* spp.
- Key diagnostics are yellow, thin, droughty turf
- Roots are brown, have few root hairs, mushy (slough off)
- Occurs where poor drainage, wet areas, shade, poor air circ., G.g.g.... or... "I've been watering for three hours a day, but it still isnt getting any better..."

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Pythium and nematodes

- Tina Gu, UF Ph.D. grad with Billy Crow
  - Collected Pythium root rot samples from May 16 to May 17 (34) and ran nematode assays
  - 88% had at least some plant parasitic nematodes
  - 56% had damaging thresholds

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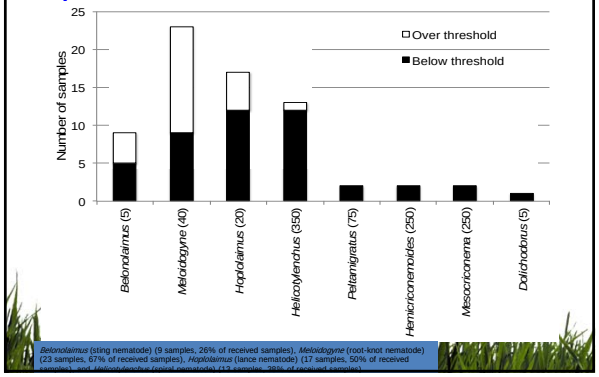
Pythium and nematodes



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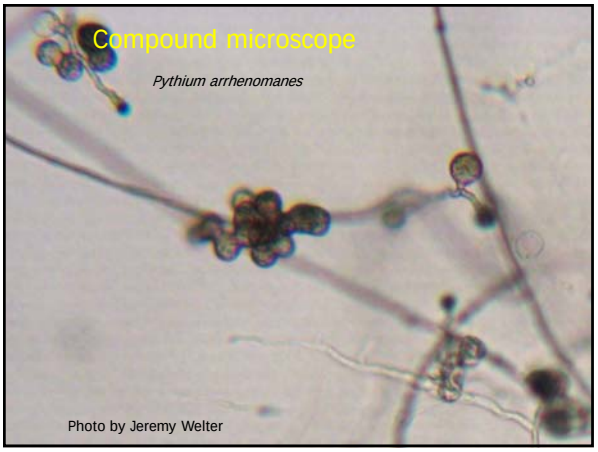

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Leaf blotch and melting out (aka Helminthosporium spot)

- Fungal diseases caused by several fungi: *Bipolaris, Drechslera, Exserohilum* spp.
- Key diagnostics are small purple leaf spots and then mushy crowns, also look for cigar-shaped spores
- Tends to be a disease of under-fertilized turf, K deficiency makes it worse.

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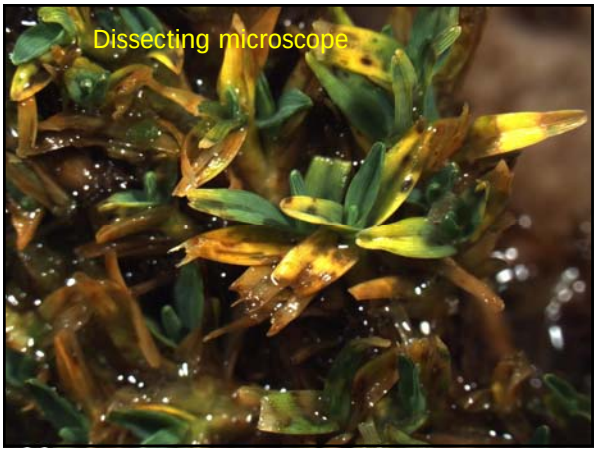

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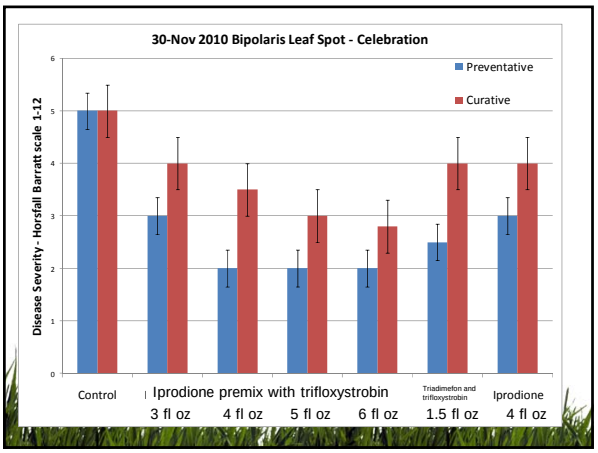

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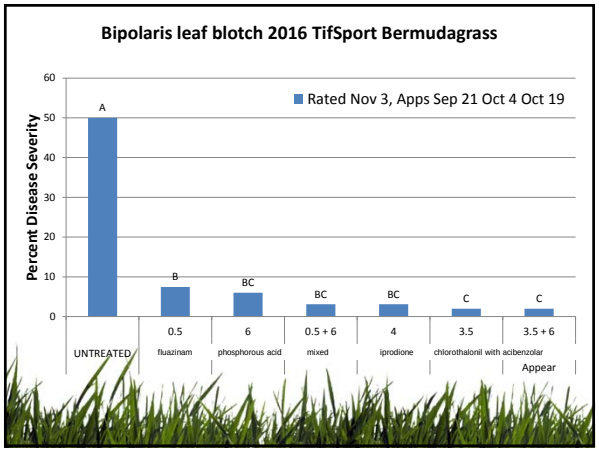

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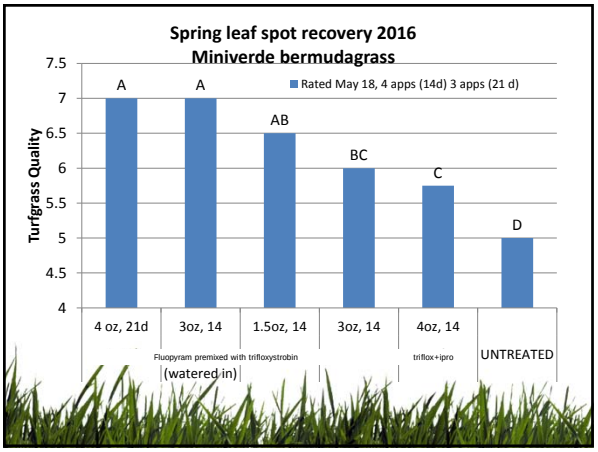

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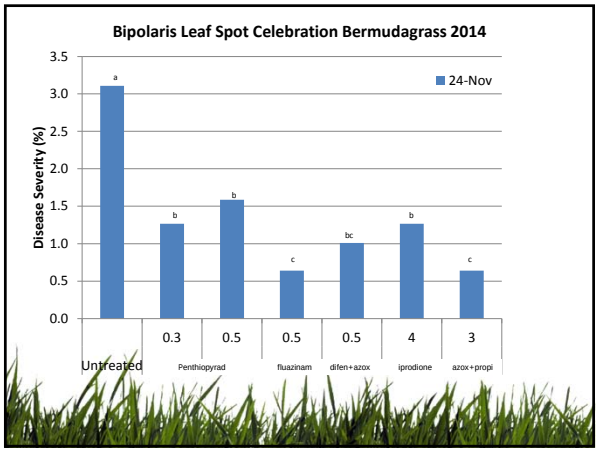

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Fungicide Selection

- 26GT is a standard that performs well
  - Among new SDHI's
    - Velista, Xzemplar, Exteris all have good efficacy
  - Daconil Action and Secure (Action) are multisite and good resistance management tools
  - Signature Xtra and Appear make good tank mix or rotation partners and give pythium as well as leaf spot efficacy
  - Briskway has a DMI component with less growth regulation

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Any Questions?
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