Mold or Bug? Differentiating between disease and insect damage on turfgrass.

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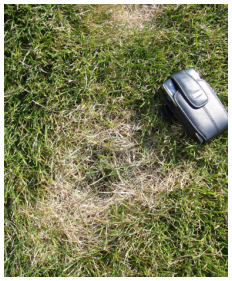
Photo from Golf Course Industry magazine

How can you tell?



How can you tell?

Why is knowing important?

No matter what symptoms you're seeing and no matter what is causing the symptoms…knowing the **biology** of the system is critical for implementing effective control and recovery.

Common Turfgrass Problems

- Biotic Agents
  - Weeds
  - Insects
  - Fungi
  - Vertebrates
- Abiotic Agents
  - Water
  - Shade
  - Fertility
  - Traffic
  - Soil Conditions
  - Fertilizer or herbicide burn

Primary Diseases of WI Lawns

- ~~Snow molds~~
- Red thread
- Necrotic ring spot
- Summer patch
- Dollar spot
- Brown patch
- ~~Rust~~

Red thread

Causal agent: *Laetisaria fuciformis*

Turfgrass hosts: Mostly fine fescues and perennial ryegrass

Optimum Conditions: 60-75°F, extended periods of leaf wetness

Symptoms: Small, diffuse patches of turfgrass varying in size from 2 to 3 inches all the way to over a foot. The turfgrass turns a tan or bleached color, and often times red "thread-like" tendrils are observed protruding from the turf.

Control: This disease is dependent on extended periods of leaf wetness, so irrigate infrequently and only in the early morning hours. During extended periods of cool/wet weather in the spring minor amounts of the disease may have to be tolerated, recovery can be aided by light nitrogen fertilization. Kentucky bluegrass can be planted in place of fine fescues or perennial ryegrass.

Red thread

Necrotic Ring Spot

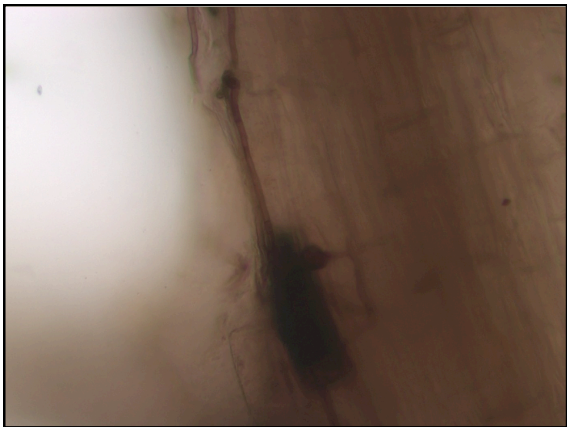
Causal agent: *Ophiosphaerella korrae*

Turfgrass hosts: Kentucky bluegrass, fine fescues, perennial ryegrass

Optimum conditions: Cool, wet weather in spring followed by warm, dry weather in summer.

Symptoms: **Is a root-rotting disease**. Circular or arc-like patches of yellow to tan turf several inches to several feet in diameter form in late spring or early summer. Resistant weeds and grasses may fill in the center of the patch giving it a "frog-eye" appearance. Most severe on sodded lawns within 2-10 years of establishment. Disease severity drops off 8-10 years after establishment.

Fungus actually attacks the turfgrass roots in spring and fall with soil temperatures between 50-65°, but disease is not observed until summer. Why?????



Necrotic Ring Spot

Control: Frustrating!!!

Once symptoms are observed nothing can be done to affect the fungus and the turf has to be nursed along with light, frequent irrigation until the fall.

NRS is also difficult to prevent on newly sodded lawns. Plant resistant cultivars of Kentucky bluegrass. Limit nitrogen fertilizer application to no more than 4 lbs/1000 sq. ft. per year. Do not fertilize much before May 1. Keep thatch under 0.5 inches.

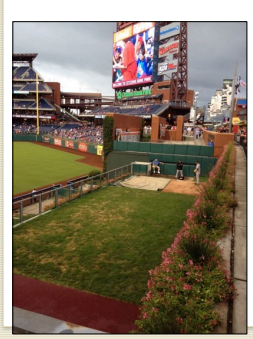
Deep, infrequent irrigation.

Summer patch

Causal agent: *Magnaporthe poae*
Turfgrass hosts: Kentucky bluegrass and fine fescues
Optimum conditions: Sustained temperatures greater than 85°F and wet soils.

Symptoms: **Is a root-rotting disease**. Circular or arc-like patches of yellow to tan turf several inches to several feet in diameter form in mid to late summer. Resistant weeds and grasses may fill in the center of the patch giving it a "frog-eye" appearance. Most severe on lawns established on compacted soils, wet soils, soils with high pH, or soils over-fertilized with quick-release nitrogen.

Fungus becomes active at soil temperatures of approximately 60°F, and causes the most damage at temperatures greater than 85°F.



Summer patch

Control:
Similar to NRS, once symptoms are observed nothing can be done to affect the fungus and the turf has to be nursed along with light, frequent irrigation until conditions cool.

Preventatively, general healthy rooting practices can be employed: -Deep, infrequent irrigation
- -Proper mowing height
- -Well-drained soil
- -Aerify in fall if needed (reduce compaction, reduce thatch layer)
- -Proper nutrition balance (do not fertilize in hot conditions)
- -If necessary, lower soil pH using acidifying fertilizers

Dollar Spot

Causal agent: *Clarireedia jacksnoii*
Turfgrass hosts: All turfgrasses species
Optimum conditions: 65-85°F, extended periods of leaf wetness

Symptoms: Roughly circular, small patches of tan or brown turfgrass 2-6 inches in diameter. Can coalesce to form larger patches of affected turf.

Control: Apply fertilizer to increase growth rate and stimulate recovery. Limit moisture as much as possible.

Dollar Spot

Ohio State University

Brown Patch

Causal agent: *Rhizoctonia solani*
Turfgrass hosts: All turfgrasses species, esp. tall fescue
Optimum conditions: Extended periods of hot (>85°F) and humid weather

Symptoms: Roughly circular brown patches of turf 1 to 3 feet in diameter

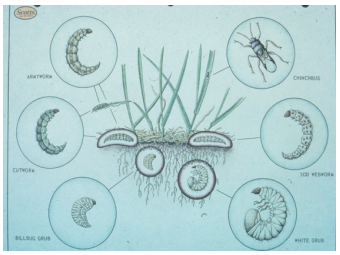
Control: Limit moisture as much as possible. Keep properly fertilized but limit fertilization during hot and humid periods.

Brown Patch

All photos from Jim Kerns, NC State

Primary Insect Pests of WI Lawns

- White grubs
- Chinch bugs
- Billbugs



White Grub Adults

Annual Grubs
GJB, EC, SMC, NMC, JB, OB, AGB
Multi-year Grubs, M/JB
Multi-gen/yr Grub, BTA

Slide from PJ Liesch, UW-Madison

White Grubs (3rd Instars)

Annual Grubs
GJB, EC, MC, JB, OB, AGB
Multi-year Grubs, M/JB
Multi-gen/yr Grub, BTA

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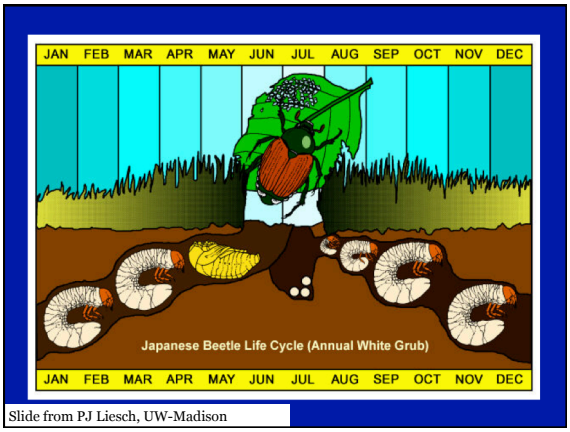

Slide from PJ Liesch, UW-Madison

White Grubs

- Management
  - Proper cultural practices are the best defense against white grub damage
  - Drier soils tend to have fewer white grubs present
  - Insecticides are effective but should be applied preventatively, timed appropriately, and watered in

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Chinch Bugs

- Damage turfgrass by sucking juices from turfgrass leaves and stems
- The turf dries out and turns brown as feeding progresses
- As damage progresses, thinning or death of the stand can occur
- Usually most severe in sunny areas during hot and dry periods

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Chinch Bugs

Pictures from PJ Liesch, UW-Madison

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Chinch Bugs

- Management
  - Sound cultural practices are the best defense
  - Irrigated turf is better able to tolerate chinch bug damage
  - Endophyte infected turf can provide meaningful resistance

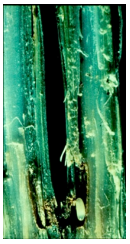
Billbugs

Pictures from PJ Liesch, UW-Madison

Billbug Feeding and Damage

- Adult billbugs cause only minor damage by chewing on stem
- Adults lay eggs within the turf stems
- Larvae emerge and chew up and down the stem and can cause significant damage
- Seem to prefer highly maintained bluegrass, most injury comes in mid-Summer

Billbug Feeding and Damage



Pictures from PJ Liesch, UW-Madison

Can perform a 'tug test' to test for billbug damage

Pictures from PJ Liesch, UW-Madison

Billbug Management

- Endophyte infected turfgrass can provide meaningful resistance
- Light fertilization and irrigation can mask low to moderate billbug damage
- Systemic insecticides timed at egg laying in the spring may be needed in severe infections

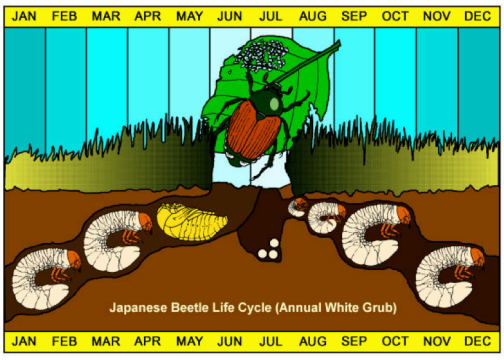
How can you tell?

What are the questions to ask?

- What do the symptoms look like? When did the symptoms show up? Have they gotten worse?
- What grass species is affected?
- Are there other healthy plants present within the symptoms?
- What have the recent weather conditions been like?
- Are there any obvious abiotic issues present?

Look for the culprit

Picture from PJ Liesch, UW-Madison



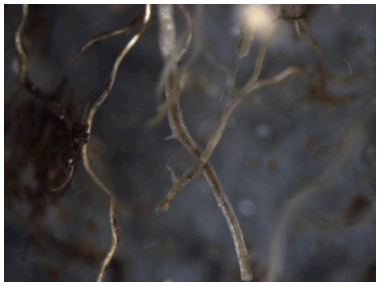
Slide from PJ Liesch, UW-Madison

Flotation method

Picture from PJ Liesch, UW-Madison

Look for the culprit!

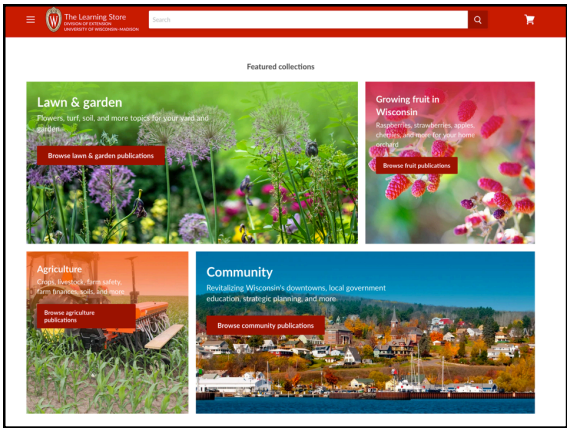
Look for the culprit!



Use your knowledge and process of elimination

- Using the symptoms, the species of grass, the time of year, and the recent weather conditions to narrow down the possibilities

Where can you turn for help?



Turfgrass Diagnostic Lab

Kurt Hockemeyer
608-845-2535
hockemeyer@wisc.edu
www.tdl.wisc.edu

Turfgrass Diagnostic Lab
2502 S. Pleasant View Rd
Verona, WI 53593

TDL
TURFGRASS DIAGNOSTIC LAB

What we look for in a submission

- Take a 4" diameter sample with half the sample being affected grass and half being healthy
- Go down into the soil approximately 3-4" to include some roots
- Wrap in tinfoil (NOT PLASTIC BAG) and ship overnight to TDL
- Submit pictures!!!

www.tdl.wisc.edu

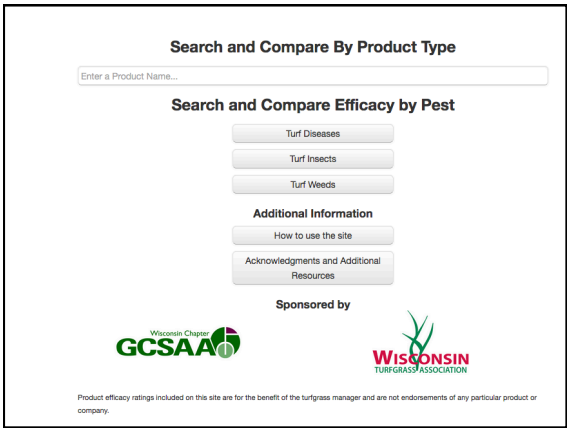
Common Mistakes

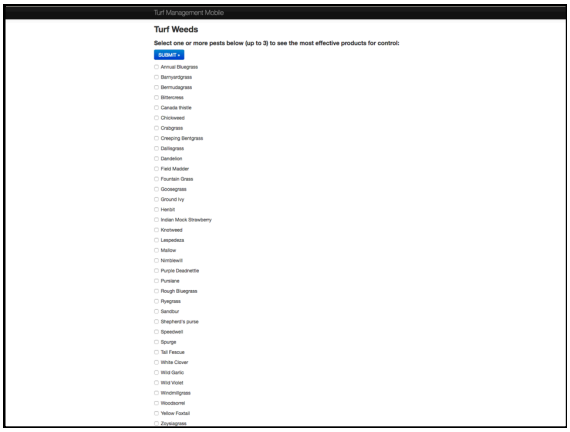
- Not filling out the submission form completely
- Not leaving contact information
- Packing sample in plastic bag
- Packing submission form with sample
- Spraying right before shipping the sample
- SENDING DEAD GRASS!!!

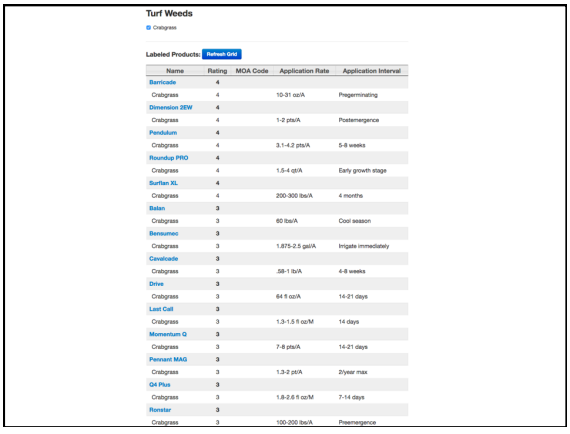
www.tdl.wisc.edu

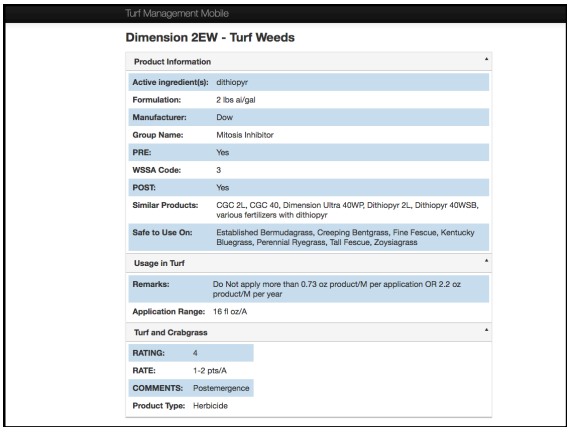
Additional Resources

- Turf Pest Management Mobile
  - Turfpests.wisc.edu
  - Pesticide efficacy ratings for herbicides and fungicides, list of labeled insecticides
  - Herbicide ratings based on research from Dr. Aaron Patton and published annually in 'Turfgrass Weed Control for Professionals'
  - Fungicide ratings based on research from Dr. Bruce Clarke and published annually in 'Chemical Control of Turfgrass Diseases'









Thank you!

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