







Learning Objectives

- Insect-related injury in the lawn
- Common insects affecting turfgrass in Georgia
- Preventing or controlling insect damage to turfgrass
- Symptoms of turfgrass diseases
- Preventing or controlling turfgrass diseases

Insects and Diseases of Turf

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Turf insect damage



White grub damage

Insect Problems in Turf

- Soil Inhabitants
- Thatch inhabitants



Steps to Managing Turf Pests

- Prevention
- Thatch removal
- Early detection



Sampling: Sweep net



Sampling: Flootation



Sampling: Irritation



Monitor pest populations



Fall armyworm damage

Correct Pest Identification



chemical damage, not insect...

Proper Selection of Control Materials



Correct Application Methods



When Applying Insecticides Consider:

- Distribution
- Irrigation requirements
- Insecticide formulation
- Timing of insecticide application
- Target zone of the insecticide application

PESTS

Identification, Life Cycle and Diagnosis

Ground Pearls



Mole Crickets



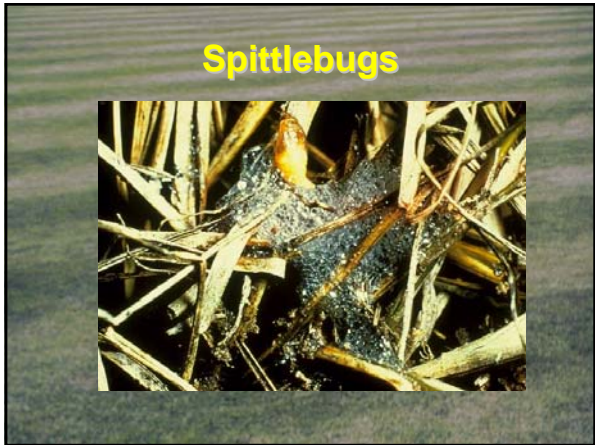
White Grubs

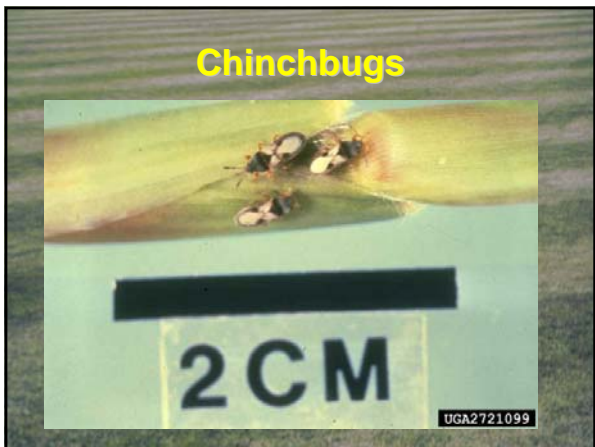


Billbugs

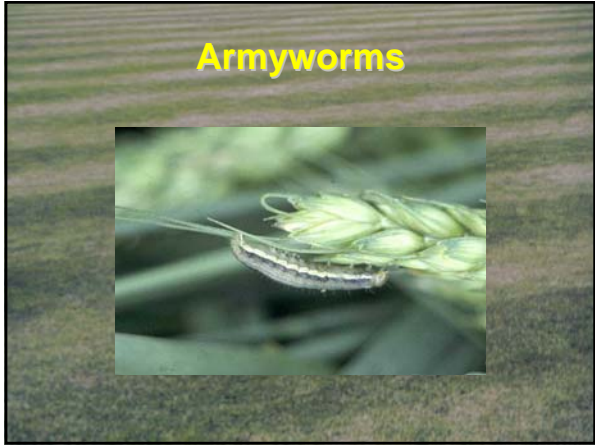


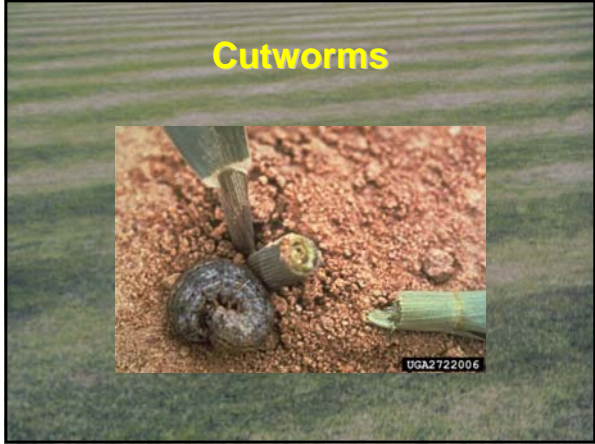






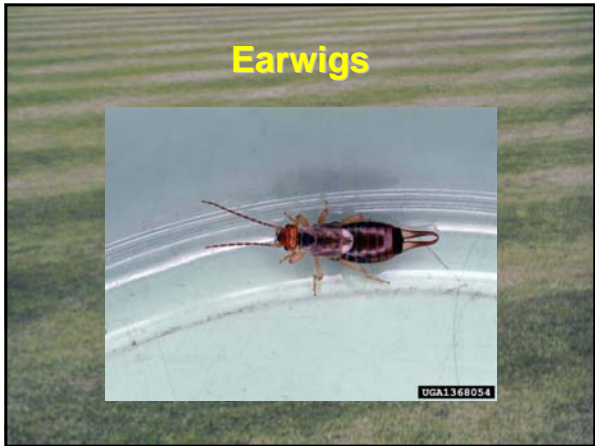












Millipedes & Centipedes



Sowbugs & Pillbugs

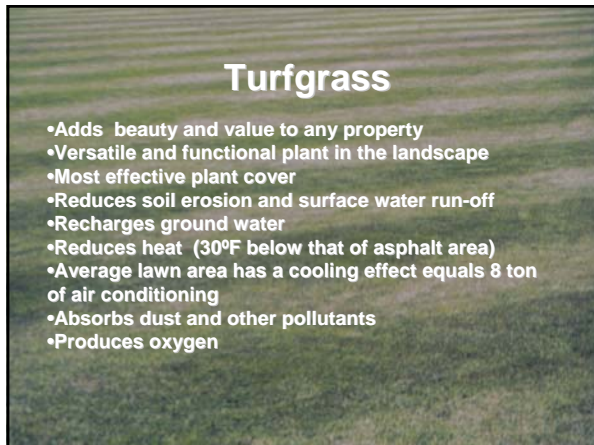


Questions?





Turfgrass Diseases



Turfgrass

- Adds beauty and value to any property
- Versatile and functional plant in the landscape
- Most effective plant cover
- Reduces soil erosion and surface water run-off
- Recharges ground water
- Reduces heat (30°F below that of asphalt area)
- Average lawn area has a cooling effect equals 8 ton of air conditioning
- Absorbs dust and other pollutants
- Produces oxygen



Diseases

- Due to diverse environmental conditions and clientele choices in GA there are a wide variety of turfgrass species grown

- Variety of turfgrass pathogens flourish

- In 2000, disease losses and control costs account for over \$200 million

Most turfgrass diseases can be avoided using proper management strategies

- Reduction in expenses
- Save water resources
- Reduce pesticide use
- Reduce negative impact on the environment

Management practices to reduce turf disease problems


- Prepare the soil properly
Take soil samples, remove debris, ensure proper water drainage
- Plant locally adapted turf species
- Purchase high quality disease-free seed, sod or sprigs
- Follow proper irrigation practices

- Apply fertilizer according to soil analysis
- Mow at recommended height
- Remove excessive thatch
- Allow for adequate light and air movement
- Follow recommended disease control practices




Brown Patch

- Caused by the fungus *Rhizoctonia solani*
- Disease symptoms are circular patterns of dead grass
- Turf turns brown and grass blades rot off

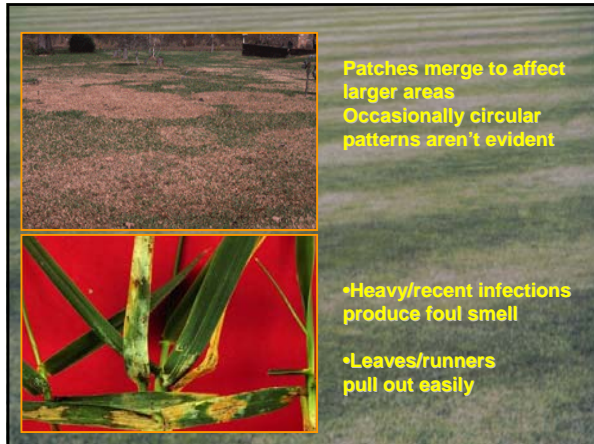


Most common in
St. Augustine, Zoysiagrass
Bentgrass
Ryegrass
Centipede
Bermuda

- Brown Patch can spread in an area from 1-50'.
- New leaves may emerge in the center of the circular patch giving the diseased areas a doughnut-shaped appearance.



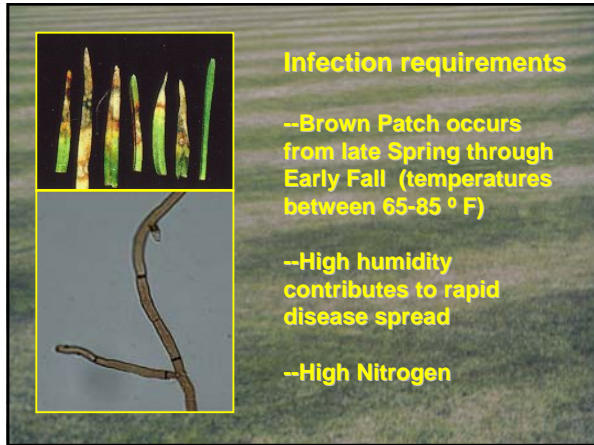
BP Accounts for 65% of UGA
Disease Clinic Turf Samples



Patches merge to affect larger areas
Occasionally circular patterns aren't evident

•Heavy/recent infections produce foul smell

•Leaves/runners pull out easily

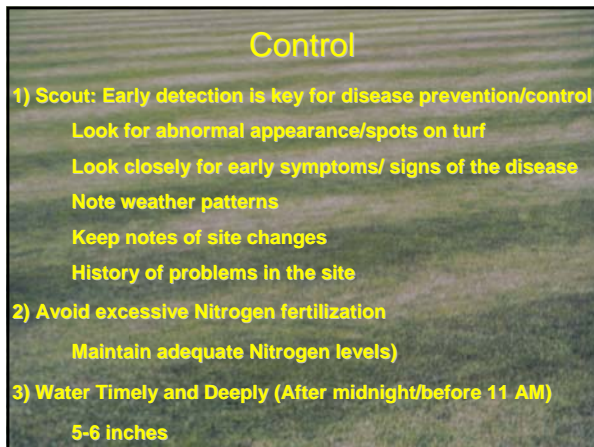


Infection requirements

--Brown Patch occurs from late Spring through Early Fall (temperatures between 65-85 ° F)

--High humidity contributes to rapid disease spread

--High Nitrogen



Control

1) Scout: Early detection is key for disease prevention/control

Look for abnormal appearance/spots on turf

Look closely for early symptoms/ signs of the disease

Note weather patterns

Keep notes of site changes

History of problems in the site

2) Avoid excessive Nitrogen fertilization

Maintain adequate Nitrogen levels)

3) Water Timely and Deeply (After midnight/before 11 AM)

5-6 inches

4) Avoid frequent light irrigation to reduce humidity
Allow time during the day to allow plant canopy to dry

5) Increase air circulation
Shrub and tree barriers contribute to shade
and lack of air circulation

6) Reduce thatch (no more than 1 inch thick)
Excessive thatch: restricts water and air movement
Promote shallow root growth
Promotes an ideal environment for pathogens


Chemical control for Brown Patch

There are many fungicides available, become familiar with the "Georgia Pest Management Handbook

Among others:
Azoxystrobin (Heritage 50 WG)
Propiconazole (Banner)
Triadimefon (Bayleton)
Ipropidione (Chipco 26091)
Trifloxystrobin (Compass)
Thiophanate Methyl (Cleary's)

Dollar Spot

- Causal agent is *Sclerotinia homoeocarpa*
- White patches up to 2 inches in diameter
- All warm and cool season turfgrasses are susceptible.

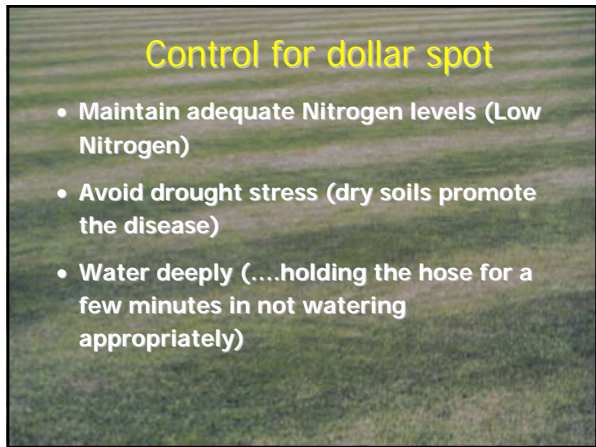


- Infection requirements
 - 50°F - 85°F (Early Spring
Late Fall)
 - Cool nights/Warm days
 - > 10 hrs leaf wetness/day
 - Dry Soils
 - Low Nitrogen promotes growth of the fungus



Control for dollar spot

- Maintain adequate Nitrogen levels (Low Nitrogen)
- Avoid drought stress (dry soils promote the disease)
- Water deeply (...holding the hose for a few minutes in not watering appropriately)




- Avoid extended moisture on leaves /remove dew in morning
- Increase air circulation
- Mow at recommended height



Chemical control for Dollar Spot

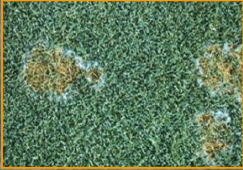

Use the "Georgia Pest Management Handbook as reference

- Chlorothalonil
- Thiophanate-methyl
- Iprodione, vinclozolin
- Triadimefon, myclobutanil, fenarimol, propiconazole





Pythium blight

- Causal agent *Pythium spp*
- Disease is characterized small, irregular water-soaked areas. Brown, orange/bronze, light/tan
- Numerous spots, merge in wettest areas



- Turf dies rapidly, collapses and appear matted
- Infected tissue feels oily to touch
- If high humidity present fluffy, cottony white mycelium present (can be seen early in the morning)





Control measures for Pythium Blight

- Water management is essential
- Correct over watering/drainage problems
- Avoid pockets of excessive humidity
- Use treated seed when Re-seeding
- Do not over fertilize with Nitrogen
- Promote light and air penetration



Chemical control for Pythium

Use the "Georgia Pest Management Handbook as reference



Fairy ring

- Different Basidiomycetous fungi
- Mushroom (basidiocarp) producing fungi
- In Nature, wood-rooting
- Circular or semi-circular band



- Affects all turf types
- Most common and damaging on Centipede, Zoysiagrass and St. Augustinegrass.
- Most on sandy soils of low fertility
- Also favored by heavy thatch
- Sometimes associated with buried debris



Management for fairy ring

- Spike or aerate affected areas
- If necessary for aesthetic purposes
Water heavily
Extra fertilizer where appropriate
- Soil replacement
- Fungicide treatment



Fungicides for fairy ring control

- Flutolanyl
- Several others with marginal effect

'Fading' and 'melting out'
Curvularia and *Helminthosporium* sp.

- Both fungi are common thatch and soil inhabitants
- Can cause disease when K is low and drought stress occurs
- Bermudagrass, zoysiagrass, centipedegrass
- Common during the past 2 to 3 years

Curvularia:
large overall decline

Helminthosporium:
light colored spots
dark edges

Factors that promote disease incidence

- High Temperature
- Drought stress
- Low aeration
- Low light intensity
- Excessive Nitrogen

Management for Curvularia and Helminthosporium diseases

- Prevent drought stress to the turf
- Water properly
- Soil test/insure adequate K
- Address excessive thatch
- Protectant fungicides available
- Consult the GA Pest Management Handbook for proper chemical control

Gray leaf spot

Pyricularia grisea



- Leaf spot disease
- Straw-gray lesions with purple/brown margins
- Rapid spread
- Severely affected leaf blades wither and turn brown



Gray leaf spot

- Affects St. Augustinegrass and Tall Fescue
- Favored by high N and excess moisture
- Optimal temps 77 to 86 °F

Management of gray leaf spot

- 'Roselawn' and 'Tamlawn' have some resistance
- Avoid excessive applications of N
- Proper watering practices
- Reduce thatch when excessive
- Reduce shade
- Avoid herbicide use above 85 °F
- Protectant fungicides available

Take-all root rot (*Gaeummanomyces graminis*)

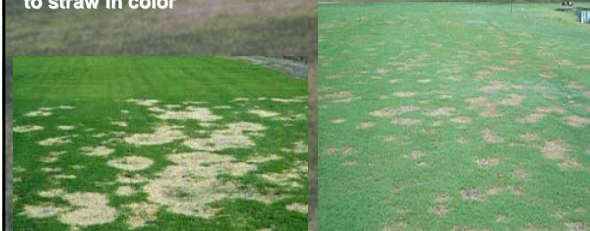


Symptoms

Starts as small light brown-straw colored death patches

Circular (dead spots, few centimeters to 1 or more meters)

During hot dry weather turf appears bronze to straw in color



Many cases St. Augustinegrass turns tan, straw colored

Roots and bases of shoots appear brown to dark

Leaves pull out easily from roots and crown, but entire plants pull out due to lack of roots (or rotten roots)

Dark roots

Yellow leaves

Thinning of turf

Necrotic areas on crown



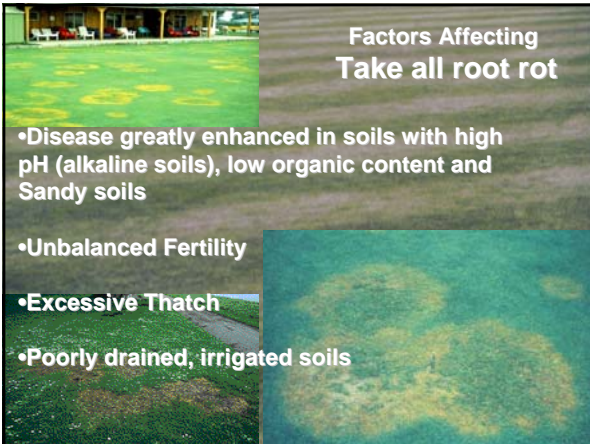
Factors Affecting Take all root rot

•Disease greatly enhanced in soils with high pH (alkaline soils), low organic content and Sandy soils

•Unbalanced Fertility

•Excessive Thatch

•Poorly drained, irrigated soils



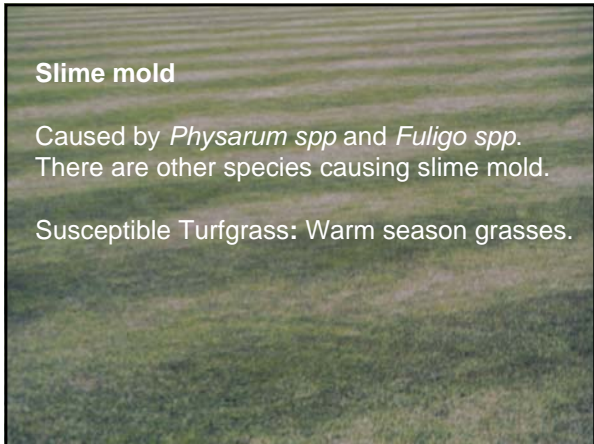


Control

- Use of acidifying fertilizers
- (Ammonium sulfate)
- Phosphorous/potassium fertilizer
- If liming necessary, use the coarsest ground material
- Maintain adequate Nitrogen levels
- Water Timely and Deeply (After midnight/before 11 AM)
- Allow time during the day to allow plant canopy to dry



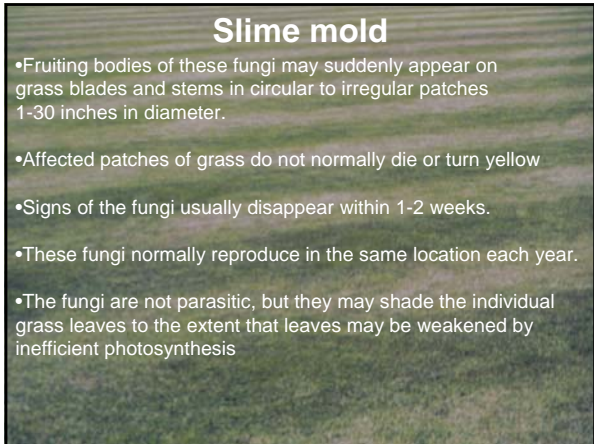
- Increase air circulation (Shrub and tree barriers contribute to shade and lack of air circulation)
- Reduce thatch (Excessive thatch restricts water and air movement. Promote shallow root growth. Promotes an ideal environment for pathogens)
- Avoid late summer heavy fertilization
- Aerification
- Soil pH 5.5 - 6.0
- Consult the GA Pest Management Control Handbook for proper chemical control



Slime mold

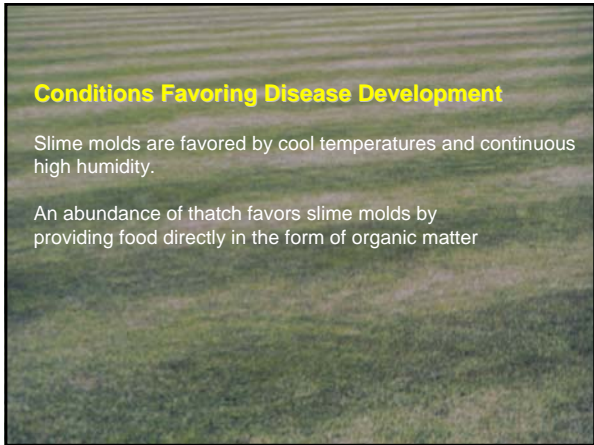
Caused by *Physarum spp* and *Fuligo spp*.
There are other species causing slime mold.

Susceptible Turfgrass: Warm season grasses.



Slime mold

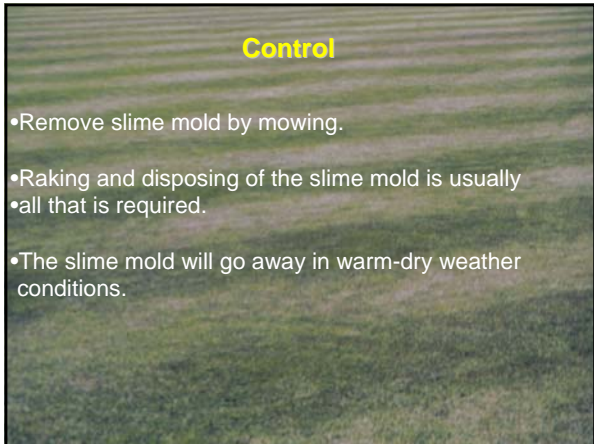
- Fruiting bodies of these fungi may suddenly appear on grass blades and stems in circular to irregular patches 1-30 inches in diameter.
- Affected patches of grass do not normally die or turn yellow
- Signs of the fungi usually disappear within 1-2 weeks.
- These fungi normally reproduce in the same location each year.
- The fungi are not parasitic, but they may shade the individual grass leaves to the extent that leaves may be weakened by inefficient photosynthesis



Conditions Favoring Disease Development

Slime molds are favored by cool temperatures and continuous high humidity.

An abundance of thatch favors slime molds by providing food directly in the form of organic matter

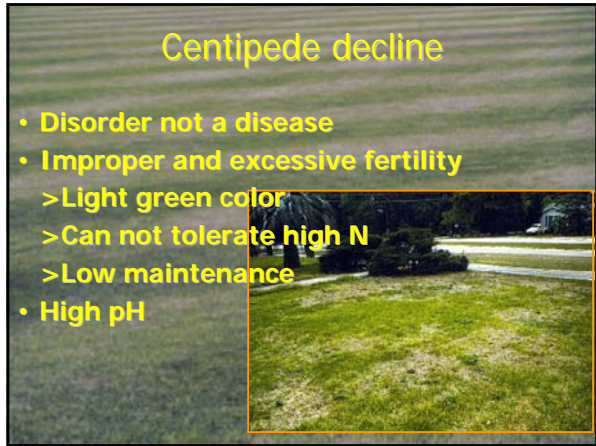


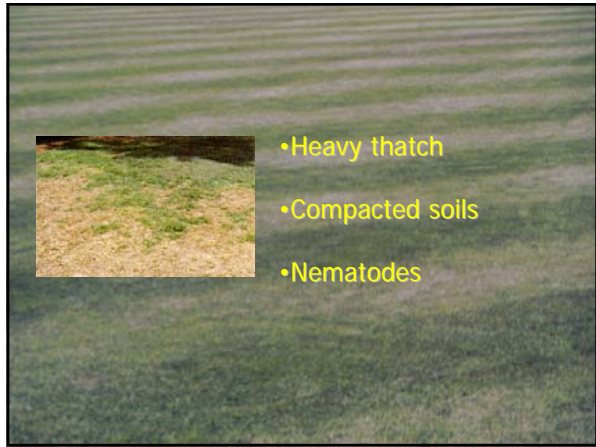
Control

- Remove slime mold by mowing.
- Raking and disposing of the slime mold is usually all that is required.
- The slime mold will go away in warm-dry weather conditions.

Centipede decline

- Disorder not a disease
- Improper and excessive fertility
 - > Light green color
 - > Can not tolerate high N
 - > Low maintenance
- High pH





- Heavy thatch
- Compacted soils
- Nematodes

Management for centipede decline

- Soil test
- Avoid over or improper fertilization
- Use 3-1-2 fertilizer ratio
- Aerate to improve root growth
- Dethatch

Remember: Most of the diseases in turf can be avoided using proper management strategies

