Anthracnose

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

PATHOGEN

Colletotrichum graminicola

TURFGRASS AFFECTED

- *Poa Annua* is particularly susceptible
- Bentgrass, bluegrass, fescue, perennial ryegrass, bermudgrass, centipedegrass, St. Augustinegrass

APPEARS WHEN

In the cooler spring and early summer a basal rot develops

FAVORABLE CONDITIONS FOR DISEASE

- Basal rot anthracnose is favored by cool, wet conditions (50 – 60 F), while the foliar blight is favored by higher temperatures (80 – 95 F) and humidity
- Occurs in conditions of low soil fertility, stressed turf
- Can be particularly severe on turf exposed to soil compaction and excess thatch

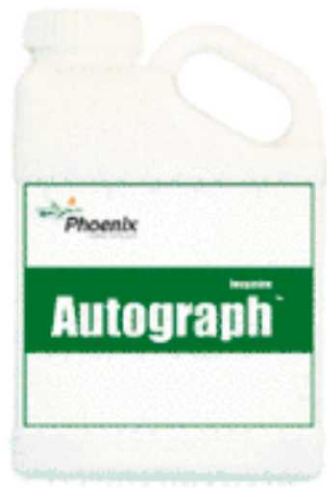
IDENTIFICATION

- Plants are killed in irregularly shaped patches that are an inch to a few feet in diameter
- On bentgrass, narrow diffuse patches of stressed turf may resemble localized dry spot
- Fungus can produce fruiting structures that have fine black hair-like projections (setae)

CULTURAL CONTROLS

- Maintain balanced nutrients, concentrating on potassium and phosphorus. Fertilize the turfgrass with low rates of nitrogen (0.1 to 0.2 pound/1,000 square feet) monthly, especially during late spring and through summer
- Irrigate deeply and infrequently based on evapotranspiration needs of turfgrass early in the morning
- Reduce compaction in fall and spring
- Increase mowing heights to reduce stress on affected turf
- Avoid irrigating in the evening
- Avoid drought stress

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL



Bermudagrass Decline

PATHOGEN

Gaeumannomyces graminis var. *graminis*

TURFGRASS AFFECTED

All warm-season turfgrasses

APPEARS WHEN

Mid summer through fall

FAVORABLE CONDITIONS FOR DISEASE

- Saturated rootzones over a period of several days harm rootzone development making plants more susceptible to disease
- Dense cloud cover reducing photosynthetic activity and storage of carbohydrates

IDENTIFICATION

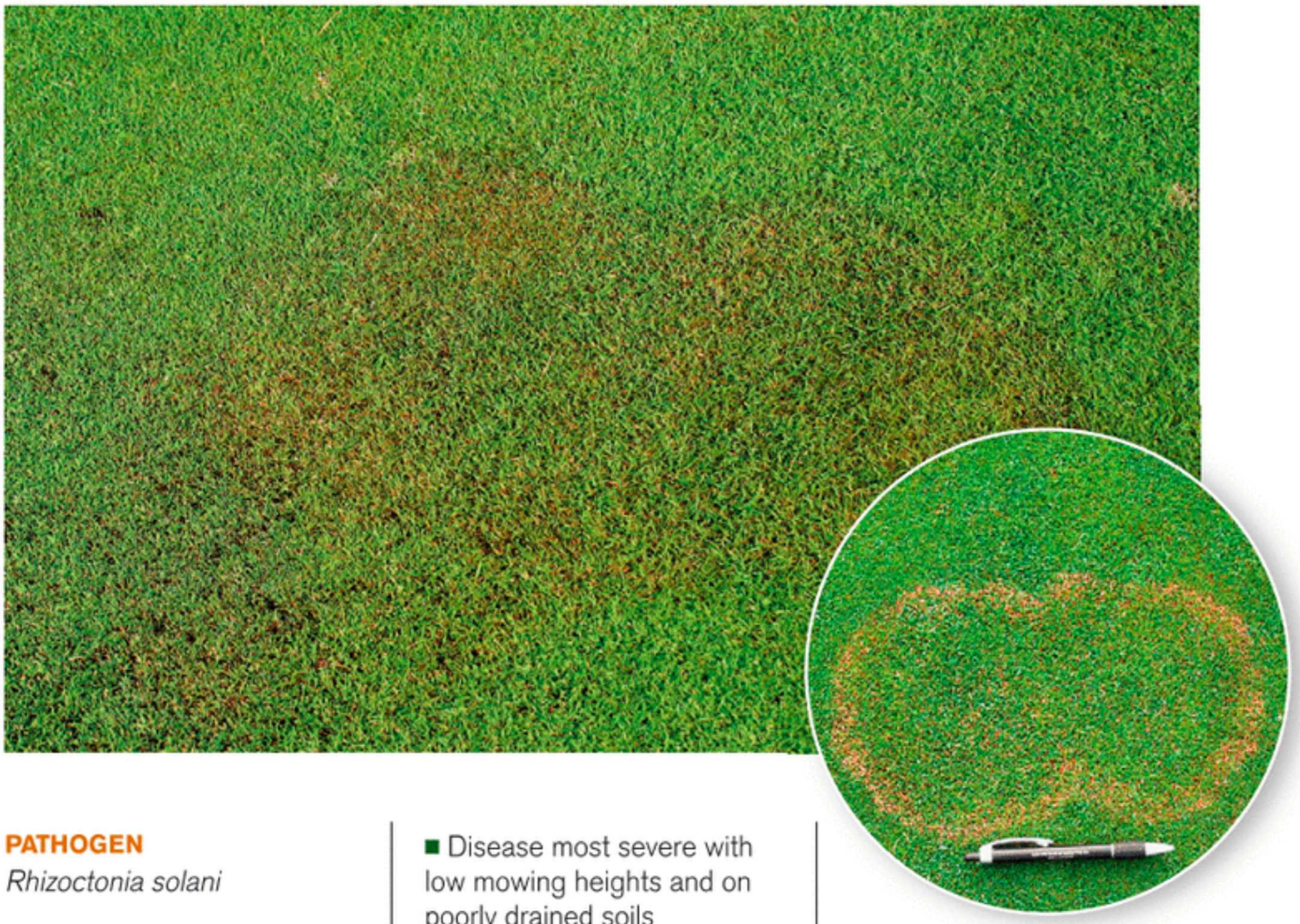
- Look for black or brown roots without feeder roots or root hairs in this root rot disease
- Signs of the fungus on the root surface appear as dark brown hypal runners
- Above-ground symptoms are irregular, yellow (chlorotic) or light-green patches ranging in diameter from a few inches to a few feet

CULTURAL CONTROLS

- Raise mowing height during periods of conducive weather
- Balance nitrogen applications with equal amount of elemental potassium
- When disease is active, frequent foliar feeding of all nutrients in small amounts

PHOTOS COURTESY: MARIA TOMASO-PETERSON, MISSISSIPPI STATE UNIVERSITY

Brown Patch



PATHOGEN

Rhizoctonia solani

TURFGRASS AFFECTED

- All cool-season species
- St. Augustine, bermudagrass, bahiagrass, centipedegrass

APPEARS WHEN

May through September

FAVORABLE CONDITIONS FOR DISEASE

- More than 10 hours of foliar wetness
- Night temperatures above 60 F
- Develops rapidly when temperatures are between 75 and 85 F
- Disease most severe with low mowing heights and on poorly drained soils

IDENTIFICATION

- Circular or irregularly shaped patches of light brown, thinned grass
- Turfgrass can be yellowish and may have a gray-brown smoke ring or outside edge
- Patches up to several yards in diameter, spreads rapidly

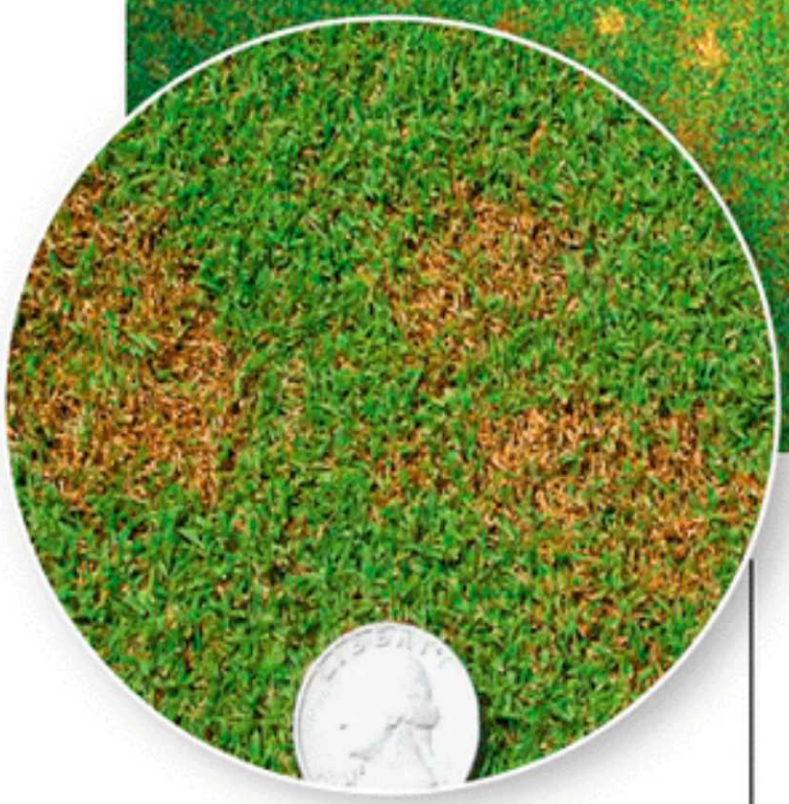
CULTURAL CONTROLS

- Improve soil drainage, remove dew in early morning by mowing, watering or whipping
- Cultivate by coring or slicing
- Avoid excessive nitrogen or irrigation
- Reduce shading and improve air movement

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

Copper Spot



PATHOGEN

Gloeocercospora sorghi

TURFGRASS AFFECTED

Bentgrass species, velvet bentgrass particularly susceptible, annual bluegrass

APPEARS WHEN

April to September

FAVORABLE CONDITIONS FOR DISEASE

- Develops during periods of warm, wet weather
- High humidity, persistent rainfall or over-irrigation encourage infection
- Disease most severe when soil pH is below 5.5

IDENTIFICATION

- Small spots (usually less than 3 inches in diameter) that are copper or salmon in color
- When turf is wet or humidity is high, infected leaves may be covered in thin, gelatinous coatings of fungal spores

CULTURAL CONTROLS

- Avoid excessive fertilizer
- Remove dew in the morning by mowing, whipping or dragging
- Deep and infrequent irrigation
- Prune nearby trees to allow sunlight and encourage air movement

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL

PHOTOS COURTESY: LANE TREDWAY, NORTH CAROLINA STATE UNIVERSITY (MAIN); JOE RIMELSPACH, THE OHIO STATE UNIVERSITY (INSET)

Dollar Spot

PATHOGEN

Lanzia and *Moellerodiscus* species

TURFGRASS AFFECTED

All grasses

APPEARS WHEN

June through September

FAVORABLE CONDITIONS FOR DISEASE

- Problems often surface when temperature changes, such as warm days and cool nights
- Drought-stressed turf more susceptible
- Closely mowed turf is susceptible
- Can be spread by mowers and other maintenance equipment
- More severe with turf under low fertility

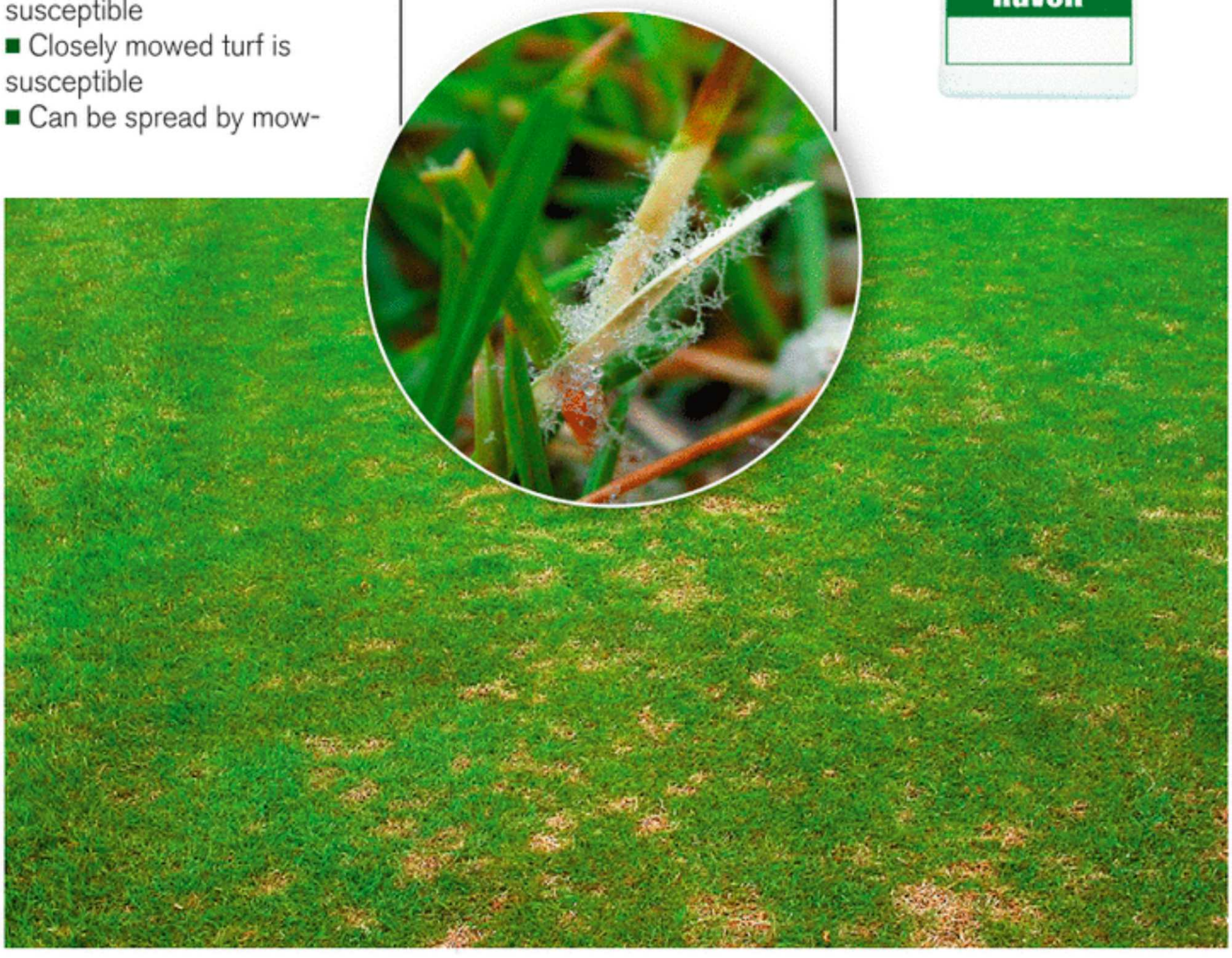
IDENTIFICATION

- Initially, affected leaves show yellow-green blotches or bands, which gradually bleach to white or straw color
- Individual lesions on the leaves often produce a constricted area resembling an hourglass
- White mycelium may be present with early-morning dew

CULTURAL CONTROLS

- Limit thatch
- Maintain balanced fertility throughout the growing season
- Avoid irrigating in the evening
- Avoid drought stress

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL



PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

Fairy Ring

PATHOGEN

Many varieties of *Basidiomycetes* fungi

TURFGRASS AFFECTED

All turfgrasses

APPEARS WHEN

- Year-round
- Generally during hot, dry weather

FAVORABLE CONDITIONS FOR DISEASE

- Lush turf with thick thatch
- Low to moderate soil moisture

IDENTIFICATION

- Rings in grass can range in size from a foot to 20 yards across or more, although most are a half-yard to 5-yards across
- Rings will form in same areas of turf each year
- Circles of mushrooms on the inner edge of rings, or wilted, dead or dark green turf
- White mat of fungal mycelium may be found in thatch or soil associated with the circles
- Rings often characterized by lush growth caused by release of nitrogen by the activity of the fungus living on the organic matter in the soil

CULTURAL CONTROLS

- Maintain moderate fertility levels
- Excavate ring and soil 12 inches deep and 24 inches beyond ring of arc and replace with new soil
- Remove sod, cultivate 6 to 8 inches deep in several directions, add wetting agent to soil, reseed or sod

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

Fusarium Patch (Pink Snow Mold)

PATHOGEN

Microdochium nivale

TURFGRASS AFFECTED

- All cool-season turfgrasses
- Creeping bentgrass, annual bluegrass and perennial ryegrass most susceptible

APPEARS WHEN

- Fall through spring
- Pink snow mold generally refers to the disease that develops under snow cover
- When it develops without snow cover or on the edges of snow cover, it's referred to as fusarium patch, a separate but related disease

FAVORABLE CONDITIONS FOR DISEASE

- Temperatures 40 F to 50 F wet weather for fusarium patch
- Pink snow mold common after at least 60 days of snow cover, but particularly severe when snow covers unfrozen ground

IDENTIFICATION

- In the fall starts as 1-inch to 2-inch orange to red-brown circular spots and will grow into larger spots
- Dead leaves may have gelatinous spore masses
- White or pink fungal threads may be observed in the early morning, giving the turf a pink cast

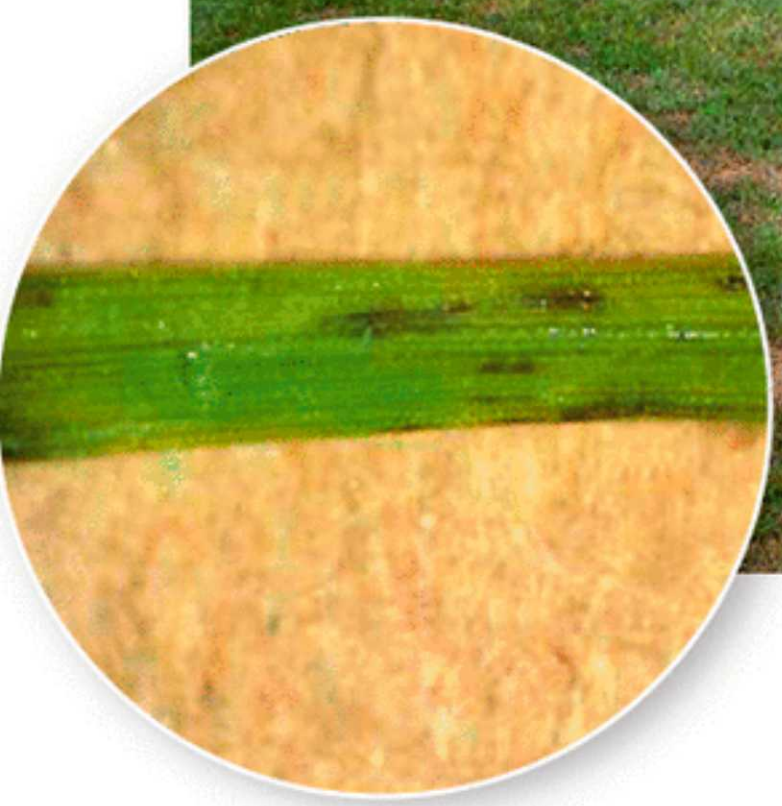
CULTURAL CONTROLS

- Remove dew from greens
- Physically remove snow in spring
- Promote good air circulation and encourage morning sun exposure through pruning of surrounding trees
- Manage thatch levels
- Avoid excessive nitrogen applications in mid-fall

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

Gray Leaf Spot



PATHOGEN

Pyricularia grisea

TURFGRASS AFFECTED

- Most warm-season turfgrasses, especially St. Augustine
- Ryegrasses and fescues may exhibit symptoms under prolonged wet, warm weather
- Most severe in newly established plantings

APPEARS WHEN

Early spring through August

FAVORABLE CONDITIONS FOR DISEASE

- Night temperatures above 70 F
- More than 10 hours of leaf wetness per day for several days
- Disease is severe in shaded areas or during periods of extended overcast weather

IDENTIFICATION

- Turf may have gray cast
- Round or oval gray spots on leaves
- Spots surrounded by brown or yellow borders
- Leaves may be blighted gray, usually from tip downward

CULTURAL CONTROLS

- To reduce the severity of the disease, avoid applying soluble nitrogen on moderately shaded turf during the summer
- Maintain balanced fertility throughout the growing season
- Avoid late-afternoon and evening watering, which keeps the leaf blades moist for extended periods
- Decrease shade and increase air circulation to enhance drying of turf

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

Moss

SPECIES

Bryum argenteum
(Silvery thread moss)

TURFGRASS AFFECTED

All turfgrasses, but mostly a problem on putting greens

APPEARS WHEN

Any season

FAVORABLE CONDITIONS FOR DISEASE

- Moss grows in areas poorly suited to turfgrass growth, areas with poor drainage, inadequate sunlight, compaction, low fertility

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

IDENTIFICATION

- Mosses are green plants with leaves arising from all sides of a central axis. Moss typically forms a thick, green mat at the soil surface. They are very competitive in cool, moist, shaded locations.

CULTURAL CONTROLS

- Maintain proper pH and nutrient levels
- Increase mowing height
- Improve light penetration
- Use shade tolerant grasses

Nematodes

Plant Parasitic (PPN)

PATHOGEN

Approximately 12 different species damage various species of turfgrass

TURFGRASS AFFECTED

All turfgrasses are susceptible

APPEARS WHEN

- PPN feed most actively when turfgrass is vigorously growing.
- They are most active on warm-season grasses during the summer and autumn, on cool-season grasses on mid to late spring and again in autumn

FAVORABLE CONDITIONS FOR INFESTATION

- PPN, which are microscopic, worm-like creatures that live in the soil and feed on turfgrass roots, are most active and create most damage in light, sandy soils that are low in nutrients and water-holding capacity

IDENTIFICATION

- Aboveground symptoms include chlorosis (yellowing) of leaves, slow growth, gradual thinning of turf, turf that responds poorly to fertilization and irrigation
- The only way to determine if nematodes are responsible for poorly performing turfgrass is to have soil samples assayed for nematodes

CULTURAL CONTROLS

- Selection of the most tolerance types of turfgrass
- Good management practices

PHOTOS COURTESY: LANE TREDWAY, NORTH CAROLINA STATE UNIVERSITY

Pythium Blight

PATHOGEN

Pythium aphanidermatum and other species of Pythium

TURFGRASS AFFECTED

- All turfgrasses
- Annual bluegrass and perennial ryegrass are particularly susceptible

APPEARS WHEN

- Generally in mid summer
- When day temperatures exceed 85 F and night temperatures exceed 70 F

FAVORABLE CONDITIONS FOR DISEASE

- Prolonged leaf wetness for several days in a row
- More prevalent in areas of poor drainage

IDENTIFICATION

- Irregularly shaped area of greasy-looking dark green, yellow brown or reddish grass that spreads rapidly
- Patches concentrate on the wettest areas of the property

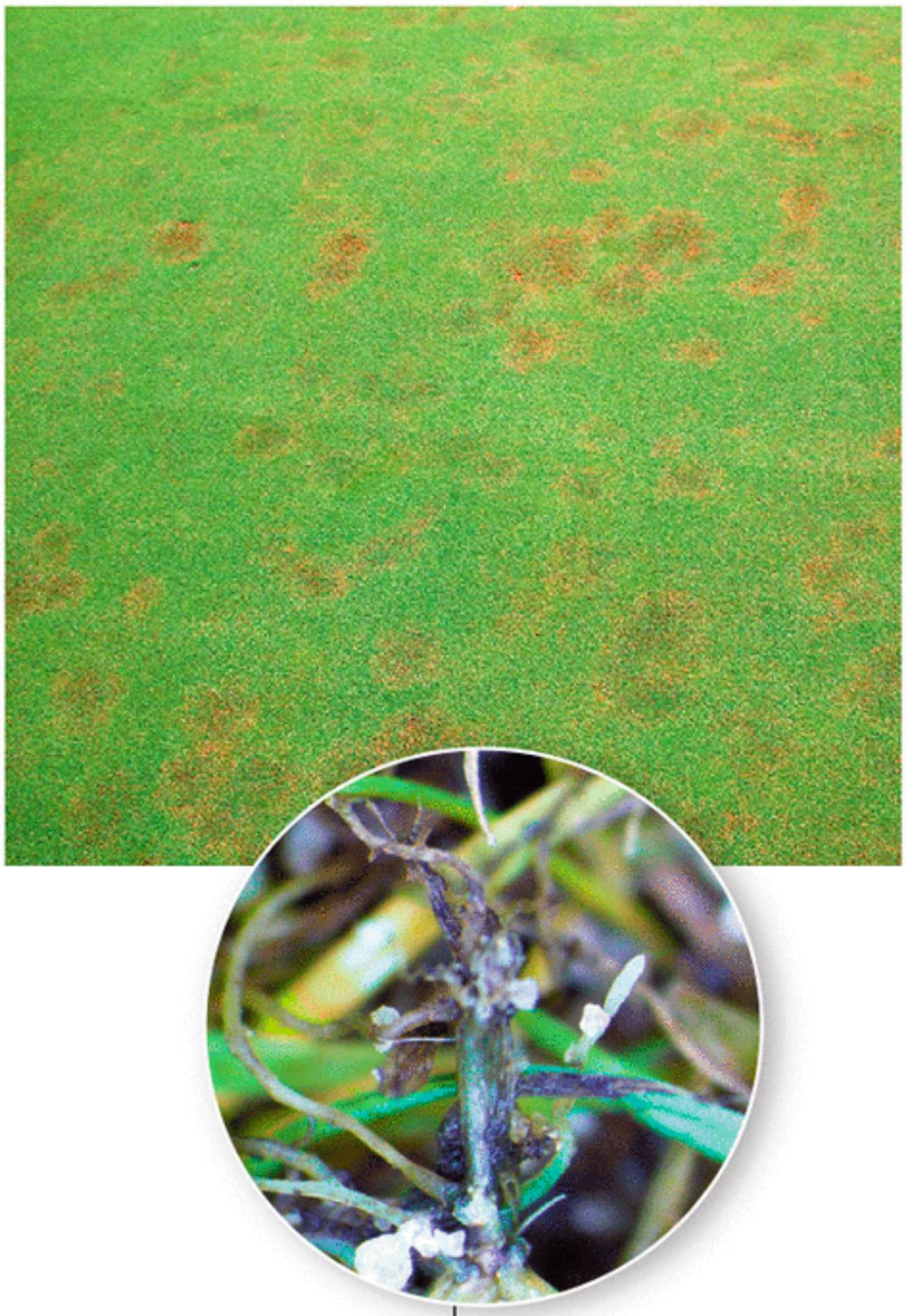
CULTURAL CONTROLS

- Avoid excess nitrogen fertility
- Maintain optimum plant calcium levels
- Decrease shade, increase air circulation, promote drying
- Don't irrigate in the evening or at night
- Don't mow when turf is wet and night temperatures exceed 70 F

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

Pythium Root Rot



PATHOGEN

Pythium spp.

TURFGRASS AFFECTED

All

APPEARS WHEN

Because there are many species of *Pythium*, the disease can appear any time of the year

FAVORABLE CONDITIONS FOR DISEASE

- Soil that remains saturated for an extended period of time
- Poor surface or subsurface drainage
- Excessive thatch and accumulated organic matter buildup

IDENTIFICATION

- Foliar symptoms include dieback from the leaf tip and leaf blighting
- Leaves may develop a tan, yellow or orange tint
- Roots, stolon, rhizomes and crowns will turn dark brown or black

CULTURAL CONTROLS

- Control moisture is vital
- Aerify and topdress often to control thatch
- Open the turfgrass to sunlight and air movement

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL

PHOTOS COURTESY: LANE TREDWAY, NORTH CAROLINA STATE UNIVERSITY (MAIN); DR. BRUCE MARTIN, CLEMSON UNIVERSITY

Red Thread

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

PATHOGEN

Laetisaria fuciformis

TURFGRASS AFFECTED

- Bentgrass, bluegrass, bermudagrass
- Fine-leaf fescue and perennial ryegrass are particularly susceptible

APPEARS WHEN

Spring and fall

FAVORABLE CONDITIONS FOR DISEASE

- More prevalent on slow-growing, nitrogen-deficient turf
- Cool temperatures of 40 F to 70 F
- More than 10 hours of leaf wetness for several days
- Occurs more on higher mown turfgrasses

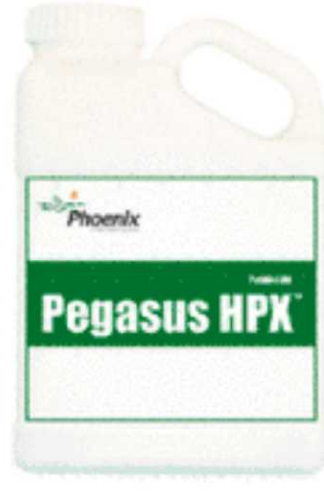
IDENTIFICATION

- Red-brown patches of turf 1 inch to 8 inches in diameter
- Pink-red mycelium grows from tips of infected leaf-blades

CULTURAL CONTROLS

- Maintain moderate to high levels of potassium and phosphorus according to soil tests
- Reduce shade and increase air circulation
- Mow turf at least once per week to remove disease portion of leaf blades

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL



Southern Blight

PATHOGEN

Sclerotilum rolfsii

TURFGRASS AFFECTED

Bentgrasses, bluegrasses, ryegrasses, bermudagrass, fescues

APPEARS WHEN

Spring into the fall

FAVORABLE CONDITIONS FOR DISEASE

- Extended periods of warm or hot weather combined with high moisture and heavy thatch
- Optimal conditions for disease development are air temperatures of 85 F to 95 F with heavy precipitation or over irrigation

IDENTIFICATION

- Affected circular or crescent-shaped areas of turf, enlarging up to 9 feet in diameter
- Turfgrass turns reddish brown as it dies
- As disease spreads, abundant mycelia appear on the turfgrass
- Dark-brown sclerotia, which are tiny and hard and resemble mustard seeds, develop at the base of stems

CULTURAL CONTROLS

- Disease is less destructive on well-fertilized, actively growing turf
- Maintain good sanitation on equipment to prevent the spread of fungus sclerotia
- Avoid overirrigation

PHOTOS COURTESY: DR. ALI HARIVANDI, UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

Spring Dead Spot

PHOTOS COURTESY: LANE TREDWAY, NORTH CAROLINA STATE UNIVERSITY

PATHOGEN

Ophiosphaerella korrae and *O. herpotricha*

TURFGRASS AFFECTED

Bermudagrass

APPEARS WHEN

Infection incurs in the fall, symptoms appear the following spring

FAVORABLE CONDITIONS FOR DISEASE

- Any factor that reduces bermudagrass root growth makes turf more susceptible
- Poor surface or subsurface drainage
- Low mowing height
- High soil moisture

IDENTIFICATION

- Circular patches of straw-colored turf up to several feet in diameter evident after winter dormancy
- Roots at edges of patches are dark brown to black
- Turfgrass roots and rhizomes of turf are black and rotten

CULTURAL CONTROLS

- Any factor that reduces bermudagrass root growth makes turf more susceptible
- Improve drainage
- Aerify at least three times annually
- Mow at recommended height
- Syringe turf when temperature is above 85 F

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL

Summer Patch

PATHOGEN

Magnaporthe poae

TURFGRASS AFFECTED

- Bluegrasses and fine-leaf fescues
- Less damaging to annual bluegrass, creeping bentgrass

APPEARS WHEN

June through August

FAVORABLE CONDITIONS FOR DISEASE

- Daytime temperatures of 85 F and above
- High soil moisture, poor surface or subsurface drainage
- Low mowing height

IDENTIFICATION

- Sometimes called frogeye patch, small patches of turf 2 inches to 6 inches in diameter
- Grass blades in the patch can change to a dull reddish-brown, then tan
- Affected areas may overlap and blight large areas of turf with "frogeye" pattern

CULTURAL CONTROLS

- Maintain balanced fertility throughout growing season
- Improve surface and subsurface drainage
- Reduce compaction

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY

Take-all Patch

PATHOGEN

Gaeumannomyces graminis var. avenae

TURFGRASS AFFECTED

Bentgrass

APPEARS WHEN

May – June and late fall (60 F to 75 F)

FAVORABLE CONDITIONS FOR DISEASE

- Develops rapidly on cool, wet soils with pH greater than 5.5
- Usually more severe on sandy soils

IDENTIFICATION

- Wilted to reddish brown or bronz circular patches of turf up to several feet in diameter
- Roots along margins of patches are dark brown

CULTURAL CONTROLS

- Disease is more severe under low or unbalanced fertility conditions
- Irrigate based on turf ET needs
- Fertilize in fall with ammonium sulfate
- Maintain moderate to high levels of phosphorus, potassium and minor elements according to soil tests
- Improve surface and subsurface drainage
- Avoid use of lime if pH is greater than 5.0
- Avoid heavy, frequent irrigation

WHAT PHOENIX OFFERS FOR CHEMICAL CONTROL

PHOTOS COURTESY: JOE RIMELSPACH, THE OHIO STATE UNIVERSITY