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HOME LAWN DISEASE CONTROL GUIDE
(Revised: October, 1985)*

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Among the many problems that confront homeowners who want to complement their home with a beautiful lawn are diseases. These diseases can often be avoided by proper establishment of lawn plus proper maintenance. The first defense against a turfgrass disease is to follow fundamental rules in good turf management such as choosing a grass adapted to Oklahoma, providing good drainage, watering and fertilizing properly, and preventing thatch buildup. The most popular lawn grasses are the bermudagrass varieties for home lawns. Other grasses such as Zoysia, Centipedegrass, St. Augustine, Buffalograss, Bluegrass, Ryegrass and Fescues are grown occasionally.

LAWN DISEASE IDENTIFICATION AND MANAGEMENT

Diseases of turfgrass common to Oklahoma are only a few among many known to occur in other parts of this country. More of the diseases are caused by fungi and, when not prevented by cultural practices, may require certain fungicides for control (Table 1). Proper use of these chemicals can enhance the quality of the environment by producing a healthy lawn; however, careless use of these chemicals may harm the grass and be harmful to the environment. Proper disease diagnosis is important in order that correct control treatment can be used. This disease control guide is prepared to assist you in identification of disease problems and provide suggested control practices. Homeowners, lawn management consultants and lawn service companies should utilize the Compendium of Turfgrass Diseases, (American Phytopathological Society), commercial lawn disease publications, OSU ExtensionFact Sheets on turf diseases or persons familiar with lawn diseases to aid with identification. Disease symptoms differ under different environments, making it often difficult to distinguish specific diseases. To avoid serious errors that result from relying solely on visual symptoms, a diseased specimen should be sent to the OSU Plant Disease Diagnostic Laboratory for identification. For information on collecting, packaging and mailing of plant disease specimens, contact your local county OSU Extension Office. Reference: Plant Disease/Diagnostic Services, OSU Extension Facts No. 7612. In order to assist you in identification of disease problems, a key has been prepared for you to follow (Table 2).

BERMUDAGRASS DISEASES

"Dollar Spot": One of the most common diseases of bermudagrass occurring in Oklahoma is Dollar Spot. This disease is largely overlooked by the homeowner. It usually appears in early spring about the time that new growth begins and again in the fall after night-time temperatures begin dropping noticeably, usually in late August. However, Dollar Spot can cause extensive damage to bermudagrass lawns during a cool-wet summer. Dollar Spot is characterized by circular bleached spots about the size of a silver dollar. When infection is severe, spots tend to coalesce forming large irregular patches. When the fungus is active, a white cobweb-like fungal growth can be seen during early morning. Many times only the upper portions of leaves are killed, and the grass will recover quickly if treated with fungicides. For control, increase the nitrogen fertility level and use a recommended fungicide (Table 1).

"Brown Patch": We seldom see the commonly recognized Brown Patch symptoms in Oklahoma bermudagrass lawns. The common symptom of Brown Patch is development of irregular circular areas a few inches to several feet in diameter with a brownish discoloration. The Brown Patch fungus

*Reviewed annually and revised as needed.

Table 1

FUNGICIDES FOR TURF AREAS IN OKLAHOMA

Revised: October, 1985

Fungicides[1] and Rate of Formulation/1000 sq ft	DISEASES[2]					
Acti-dione Thiram 2-4 oz	BP	DS	HL			
Bayleton 25WP 1-2 oz	BP	DS			R	
Chipco 26019 1.5-2.0 oz	BP	DS	HL			
Daconil 4-8 oz (preventive-4 oz; curative-8oz)	BP	DS	HL		R	
Duosan 3-6 oz	BP	DS	HL		R	
Dyrene 4-6 oz	BP	DS	HL		R	
Fore 6 oz	BP		HL		R	A
Fungo 1-2 oz (10-14 day schedule)	BP	DS				
Tersan 1991 1-2 oz (10-14 day schedule)	BP	DS				
Tersan LSR 3-4 oz	BP		HL		R	
Turfside (Terraclor 10G 2-7.5 lbs)	BP					
Vorlan 2-4 oz	BP		HL	PB	R	
Banol 1.5-4 oz				PB		
Koban 4-6 oz				PB		
Subdue 2E 1-2 oz				PB		
Terrazole 35WP 4-8 oz				PB		

1/ Trade names are used rather than chemical names for brevity and clarity. This does not imply that one formulation or trade name is recommended over others containing the same ingredient.

2/ Diseases controlled: BP=Brown Patch; DS=Dollar Spot; HL=Helminthosporium Leafspot; PB=Pythium Blight; R-Rusts; A=Algae.

commonly attacks and weakens the bermudagrass root system. Dark brown, rotted areas on roots and underground rhizomes can be found in diseased grass. This soilborne disease can be overlooked because above-ground symptoms, consisting of low vigor, browning of grass, and thinning of the grass, are easily confused with low fertility, drought and other problems. The disease occurs during warm, wet weather. Brown Patch is most severe under high nitrogen fertility.

Soil fungicide applications protect the root system and have proven effective in maintaining and improving growth and density of bermudagrass turf (Table 1).

"Spring Dead Spot": This disease of bermudagrass, first appears as circular dead areas (six inches to two feet) in the spring when the rest of the turf area turns green with new growth. Normally, bermudagrass does not invade these dead areas as the growing season progresses nor do the dead areas increase in size. Dead areas enlarge during the dormant season and may coalesce to form large, irregular areas of dead turf. The cause of "Spring Dead Spot" disease is not definitely known. Research indicates that the disease is associated with thatch accumulation, soil high in clay content, soil having a high water holding capacity and certain soil fungi. If these are correct, then control of the disease may best start when a lawn is planted. Where the lawn is already established, temporary recovery of dead areas can be speeded up by cultivating dead areas thoroughly. This may not, however, prevent the spot from reappearing the following year. Dead areas can be removed to a depth of 6 to 8 inches and replaced with a more sandy soil. This area will not be dead the following spring, but new dead spots may appear some other place in the lawn. Probably the best over-all treatment of an established lawn is to insure that the lawn is well drained. In some cases, application of gypsum will improve soil condition and will aid in growth of grass. It is also advisable to remove thatch from bermudagrass lawns once a year, preferably in late February. This practice will minimize water accumulation and retention in the thatch layer, provide a smoother more uniform mowing surface and, therefore, a more beautiful lawn. Repeated applications of soil fungicides, Terraclor Super X, Turfcide or Tersan 1991, have helped in grass recovery and prevention of Spring Dead Spot symptoms from reappearing the following spring. "Helminthosporium Leaf Spot": Another disease which attacks leaf blades is

Table 2

KEY TO THE DISEASES OF TURFGRASS IN OKLAHOMA

Section	Description	
1	Leaves healthy	Move to section 8
1	Leaves spotted, usually not entirely yellow or brown	Move to section 3
1	Leaves yellow or turning brown	Move to section 2
1	Leaves and all other plant parts dead	Move to section 5
1	Leaves covered with white to light gray dirty mold	Powdery Mildew
1	Leaves covered with black to dark gray dusty mold	Slime Mold
2	Leaves mostly dead at the base, easily pulled from runners, runners not dead	Brown Patch
2	Leaves usually only yellowish, not dead, growth poor	St. Augustine Decline
3	Leaf spots graywith purple or black ring around the spot	Move to section 4
3	Leaf spots raised, yellowish, dusty	Rust
3	Leaf spots dark, often with yellowish area around the spot and often in irregular lines along the leaf	Helminthosporium Spot
4	Disease found on St. Augustine grass	Gray Leaf Spot
4	Disease mostly on Bermudagrass or grass other than St. Augustine grass forming small dead spots about the size of a silver dollar in the lawn	Dollar Spot
5	Dead areas appearing only in spring as grass turns green	Move to section 6
5	Dead areas appearing during summer growing season	Move to section 7
6	Dead areas regularly circular over 6 inches in diameter, in Bermudagrass	Spring Dead Spot
6	Dead areas irregular in shape, in other grasses as well as Bermudagrass	Winter Injury
7	Dead areas small, circular, usually with "wet" or "greasy" appearance, most often in shaded areas	Pythium Blight
7	Dead areas small, circular, often whitish or gray in color, about the size of a silver dollar	Dollar Spot
7	Dead areas usually over one foot in diameter, with wilted appearance, sometimes cobwebby fungus growth	Fusarium Blight
7	Dead areas inside a dark green ring of grass	Fairy Ring
8	Seed heads black with dusty appearance	Smut

called "Helminthosporium (or usually called 'Helminth') Leaf Spot". This disease is usually found during hot, humid periods of summer, and is usually more severe on wide-bladed, common strains of bermudagrass. The spots are dark reddish-purple and frequently occur in irregular lines among leaf blades. If the disease is not controlled leaves will wither and die. Later, leaf sheaths, stems, stolons and roots may be attacked, producing large irregular areas of dead grass. Infections are seldom severe for lawn varieties of bermudagrass, but can occur under favorable weather conditions. Lawns under a high maintenance program and during weather favorable for the disease may require fungicide sprays to maintain quality turf (Table 1).

"Fairy Ring": This disease can be recognized by a circular pattern of dark green grass surrounding areas of light colored or dead grass. After periods of wet weather, usually in spring and fall, toadstools or mushrooms appear in the green ring of grass. These mushrooms are the above ground part of the fungus causing fairy ring. Fairy ring is usually caused by one of the various fungi that grow on non-living plant material and may occur deep in the soil. Fairy ring frequently develops from an old tree stump or pieces of wood left and buried during construction. For this

reason, care should be taken that all construction debris, especially wood material, is removed and not buried.

Control of "Fairy Ring" is difficult. Best control can be obtained by removing the original source (wood debris), from which fairy ring developed and fumigate the soil. Control can be obtained by digging the entire fairy ring out. Mark the area at least one foot beyond the ring and remove sod within the area to a depth of one foot. Be sure to remove all soil that could be infested with the fairy ring fungus. Then fill the hole with noninfested soil and reseed or resod the area with fairy ring free soil. Soil can be fumigated with methyl bromide. Follow the manufacturer's directions for proper amounts.

"Rust": Almost all types of grass have a disease called "Rust", and bermudagrass is no exception. These are fungal diseases that produce a small rough, raised, yellow, or reddish yellow spot on the leaf. Quite frequently the leaf blade is almost completely covered with these spots. If the leaf blade is pulled between fingers, the surface feels rough and a yellowish dust from the spots will come off on the fingers. The leaf looks and feels like a piece of rusted metal, consequently the name "Rust". The disease attacks only the leaf blade and leaf sheath, but if disease is severe and not controlled, grass will be weakened and will be susceptible to winter injury, drought, or other adverse conditions. Also, the lawn will be unsightly, and yellowish dust will accumulate on shoes or clothes brought in to contact with grass.

Fortunately, only a few varieties of bermudagrass, such as Sunturf, are susceptible. Like the disease "Helminthosporium Leaf Spot", "Rust" requires several days from infection to development of the raised spots. Therefore, more frequent mowing may be sufficient to control the disease. Also, "Rust" usually occurs only during warmest parts of summer when night time temperatures remain close to 80 degrees. If frequent mowing is not practical, or if weather favors disease more frequent mowing does not give adequate control, then one or two fungicide sprays may be applied (Table 1).

"Slime Mold": These are a group of fungi that grow and cover grass during wet weather. Slime molds usually form a mass of bluish-gray, black or yellow material in spots on the grass. These fungi are not parasitic on the grass, but merely grow on the surface of leaves. Damage to grass is from shade, which causes a yellowing of the grass. The slime mold fungus can be removed by washing it off with a garden hose, sweeping with a broom, or mowing. During extended periods of high humidity, slime molds may persist and chemical control may be required. Most of the broad spectrum turf fungicides will control slime molds.

"Smut": This disease of bermudagrass may occur with infrequent mowing. The fungus is "systemic" in the grass plant; that is, it invades all parts of the plant, but the only signs of infection are in seed-head portions of plant. These seed-head portions turn black and have a dusty appearance. This black dust (fungus spores) may accumulate on shoes or clothes brought into contact with grass. The growth of grass is not materially affected by the disease, so the only real need is to prevent seed-heads from appearing. This can be done by frequent mowing, particularly in the latter part of the summer and early fall. Only U-3 and common bermudagrass are affected at present, and there are no chemical controls for this disease. If it is necessary to completely control it, the only way known at this time is to destroy the infected area completely, allow the area to remain out of bermudagrass for at least one season, and then replant from a source of grass known to be free of this disease. If a new lawn is established with either U-3 or common bermudagrass, it is well to insure that the source of grass is free of "Smut".

"Pythium Blight": Although species of Pythium can be part of the soil disease complex, Pythium blight, as known in Bentgrasses, Rye and Fescue grasses,is not a common problem among the Bermudagrasses.

ZOYSIA GRASS DISEASES

Zoysia grass is becoming increasingly popular in Oklahoma and is being used in home lawns. Zoysia will need a management program that differs from the program carried out on bermudagrass. Special emphasis is needed on fertilization, thatch management, watering and mowing. Being a slow grower, foliar diseases that are reduced by more frequent mowing will have more time to become established. Hence, the disease management program may differ from the faster growing bermudagrasses.

"Rust": One of the major diseases found on zoysia grass in Oklahoma is "Rust". The disease is characterized by small rough, raised, reddish-yellow spots on leaves, similar to those found on bermuda. Varieties Meyer and Emerald are found often more severely affected by rust than any other varieties of Zoysia (Table 1).

"Brown Patch": Deterioration of zoysia grass lawns has been associated with the Rhizotonia fungus, the cause of Brown Patch. The distinct circular to irregular brown patches of dying grass associated with the Brown Patch disease rarely occur in Zoysia. This fungus seems to attack Zoysia much like bermudagrass, by damaging leaf sheaths, stems, crowns and roots, and is more severe when high nitrogen and thatch are present. Nematodes feeding on roots increase severity of disease. Control of this disease would include a fertility thatch management program and a soil-fungicide (Table 1).

"Other Diseases": Zoysia grass is susceptible to Sclerotinia Dollar Spot and Helminthosporium diseases. However, they are not a problem in Oklahoma at this time.

ST. AUGUSTINE GRASS DISEASES

A long time favorite in the deep South, St. Augustine has large flat stems and broad, coarse leaves, and is highly susceptible to Brown Patch, Gray Leafspot and St. Augustine Decline Virus (SADV). Dollar Spot and Downy Mildew have been reported on St. Augustine grass in other states. "Gray Leaf Spot" disease in St. Augustine grass is similar to a disease called "Helminthosporium Leaf Spot" of bermudagrass. The name of the disease comes from color of the dead spot on the leaf blade. These gray spots are usually surrounded with a very narrow band of red to brownish color. Disease develops during periods of high temperature and high humidity and may be severe enough to make leaves wither and die.

Irrigation should be avoided whenever possible and should be applied in the very early morning when required. In contrast to "Dollar Spot", which is often called a "poor man's disease", "Gray Leaf Spot" is called "rich man's disease" because it occurs more severely on grass that has been fertilized well, or over fertilized with nitrogen. Therefore, nitrogen in St. Augustine grass lawns should be maintained at a minimum level that will give good lawn color and texture, especially during the mid-summer period of high temperatures and high humidities. During periods of wet weather or high humidity, fungicides may be needed at weekly intervals. "Brown Patch" symptoms in St. Augustine grass are circular or often irregular patches of brown grass 6 inches to several feet in diameter surrounded by a dark green or blue-green band 1 to 3 inches wide--or may be indistinct, such as thinning of grass in the affected patches. The disease is caused by the Rhizoctonia fungus that resides in the soil and may kill the entire plant. Sheaths of leaves are usually affected first, which causes wilt and death of leaf blades; then the stem is entered, and finally, crowns and roots of plants are killed. Progress of disease is usually slow, and disease symptoms usually appear when the leaf sheath is first attacked. Therefore, if control measures are applied when symptoms first appear, the disease can be stopped before death of the plant.

Water the lawn early in the morning so the soil surface will not remain wet any longer than is necessary. Excessive applications of nitrogen should be avoided during months of June and July. In spite of these efforts, however, "Brown Patch" may yet appear in St. Augustine grass, particularly after rain showers. A fungicide will be needed to control disease spread. If a wet soil condition persists, fungicide sprays may be necessary every 7 days (Table 1).

"St. Augustine Decline" (SAD). In the disease of St. Augustinegrass the lawn area slowly becomes light-green and then yellowish-green in color; grass lacks vigor in spite of proper fertilization. There is no response to chemical spray, and eventually the grass dies out in irregular patches until the entire lawn area is dead. The cause of the disease is a virus. A reported resistant cultivar of St. Augustine-grass was released by cooperative efforts between the University of Florida and Texas A&M University. This virus resistant cultivar is called Floratam. However, it lacks winter hardiness, and has poor leaf texture. St. Augustine should be planted only in southern Oklahoma.

TALL FESCUE GRASS DISEASES

Tall fescue grasses are susceptible to Pythium blight, Helminthosporium net blotch, Dollar Spot, White Spot, leafspot, Crown rust, Fusarium blight, Ophiobolus patch and Rhizoctonia brown patch. Pythium blight and Rhizoctonia brown patch probably are the only diseases that would create a problem on fescue grown in Oklahoma.

"Pythium Blight": This disease may also occur on other lawn grasses, but it is particularly destructive to tall fescue grass. The disease is caused by a fungus in the soil, and therefore, the plant is usually attacked at or near the soil surface. Grass seems to melt, become water soaked, mats together and appear greasy or slimy. This disease is very dependent upon wet conditions, so it does not appear often, but when it does, it is extremely severe, destroying large areas of grass in a matter of hours. A wet soil, high temperatures and high humidity are essential for disease to develop. Since these conditions occur most frequently in mid-summer, and in shade or at night, these are times and places where we expect disease to develop.

During the mid-summer period, and particularly in shaded areas, irrigation should be avoided unless absolutely necessary. Fungicide sprays can be applied for disease control; however, by the time the disease is usually seen and identified, it is too late for the fungicide to be effective. It is necessary, therefore, to anticipate disease and apply a fungicide that has longevity before disease appears. For example, if the soil surface is wet, and high temperatures, particularly at night, are forecast, then it would be advisable to apply a spray to the lawn. Many chemicals available for this disease do not persist very long, so when weather conditions favor development of this disease, daily spray applications may be required, particularly in shaded areas. For recommended fungicides, see Table 1. "Brown Patch" appears as light brown areas of dying grass, irregular to circular in shape, a few inches to several feet in diameter. Unlike bermudagrass and zoysiagrass, disease is more visible above ground. However, the Rhizoctonia fungus will cause extensive damage to grass roots and crowns. Soil and foliar fungicides may be required for effective disease control (Table 1).

FINE FESCUE GRASS DISEASES

The fine leaf fescues are becoming morewidely used in Oklahoma lawns, particularly in shady areas under trees, etc., and are known to be susceptible to Fusarium blight, Helminthosporiuim leafspot, Dollar spot, Anthracnose, Corticum redthread, Rust and high temperatures.

"Fusarium Blight Syndrome" is usually not considered a disease of southern turf areas, but it does occur in the western high-plains area of Oklahoma. The disease in that area and in more eastern parts of the State is similar to "Pythium Blight" of tall fescue grasses. Typically disease starts as a small gray to yellowish-white spot 6 to 12 inches in diameter. Many spots may appear enlarged and join together to form large, irregular areas of dead grass. Disease may develop very rapidly in the hot part of summer if the soil surface is wet. It may occur so rapidly that the first symptoms of disease, small spots, are not noticed until large areas of grass are dead.

Watering should be avoided as much as possible during the hot summer. If irrigation is necessary, it should be done very early so that the soil surface can dry as quickly as possible. Grass should be cut at the shortest recommended height during this period so that as much sunlight will reach the soil surface as possible. When soil surface is wet, and high nighttime temperatures are forecast, a fungicide should be applied (Table 1).

BLUEGRASS AND RYEGRASS DISEASES

Kentucky bluegrasses are grown successfully in northern Oklahoma. Ryegrasses are used

throughout the state, mostly in shade areas. These grasses are susceptible to Powdery mildew, Rust, Helminthosporium blight, Fusarium blight, Rhizoctonia brown patch and Pythium blight. However, there is variation in susceptibility among the various cultivars. "Powdery mildew": Most everyone is familiar with the disease called "Mildew". It causes a white to gray powdery layer over the leaf surface which most of us have seen on lilacs and roses. This disease also occurs on bluegrass in Oklahoma, and if not controlled, can be quite destructive. In order to survive high summer temperatures in Oklahoma, bluegrass needs almost constant irrigation. This contributes to high humidity close to the soil surface and greatly favors disease development. Since the grass will die if irrigation is withheld, it may be necessary to spray a fungicide for control of this disease. (Table 1).

"Rust" occurs also on bluegrass. Symptoms and control practices are similar to those of other grasses. Please refer to previous sections.

"Pythium blight" is sometimes called cottony blight because of white masses of fungus growth on dense populations of newly seeded ryegrass or bluegrass under very moist conditions. This can be a very destructive disease when environmental conditions are favorable. This disease is more commonly found in moist, shaded areas of established or newly seeded lawns and spreads quite rapidly. Infected leaves seem to melt, become water soaked, mat together and appear greasy or slimy. Under more moist conditions, masses of white to gray mycelium will mat the plants together. Spread of the disease can be reduced by allowing area to dry; however, the most effective control is obtained with use of fungicides (Table 1).

"Rhizoctonia brown patch" is similar in appearance and control to the disease on fescue. See previous discussion.

FACTORS IN A GENERAL DISEASE CONTROL PROGRAM

1. Diseases are less likely to cause extensive damage to grass that has been properly maintained according to recommended cultural practices. Good drainage is essential. Proper watering, fertility and mowing practices reduce disease potential and provide a more thrifty grass.
2. Diseases are most likely to occur during periods when the weather is warm and when there is an abundance of moisture. Moisture may result from rain, heavy dews, or watering practices.
3. Many types of injury such as those caused by insects, spilled toxic materials, excess fertilizer and improper mowing can be confused with fungal disease damage.

Individuals should eliminate the possibility Of injury by these causes before assuming fungal disease is present. Hence, presence of disease is indicated when either the grass continiues to decline or the condition spreads to new areas.

4. When a disease is found in a planting of grass, it should be identified and proper control measures started as soon as possible.
5. Fungicides do not control diseases in the same manner that insecticides control insects. Most fungicides are protectants; they do not kill the disease as an insecticide kills an insect. Fungicides control the spread or increase of disease incidence by preventing the fungus from infecting healthy plants. Diseased grass parts die and healthy grass fills in this area of turf.
6. Control of a fungal disease is often best accomplished by use of a fungicide. When using a fungicide, the following points should be kept in mind:

   a. In most cases it is best to spray the entire planting or if lawn if quite large, spray areas conducive to disease and not just the diseased area
   b. Directions and precautions on fungicide containers should be followed carefully.
   c. Fungicides should be sprayed on the area so that there is complete and even distribution; otherwise, grass may be injured and disease not controlled.
   d. Use enough water to wet grass thoroughly (2 to 5 gallons per 1000) square feet is usually sufficient).
   e. Repeated application may be necessary to keep disease under control. Intervals between sprays will depend on chemical used, environmental conditions, and disease pressure.
   f. Do not mow grass immediately after applying a fungicide.

SOIL FUNGICIDE SUGGESTED FOR TURFGRASS IN OKLAHOMA

For Bermuda, St.Augustine and similar grasses, apply Turfcide 10G at the rate of 7.5 lbs of formulation per 1000 sq ft to prevent a root rot disease caused by the fungus Rhizoctonia solani. Apply in the spring and fall at first indication of infection. Following fungicide application, treated areas should be watered to wash chemical from the grass and move it into soil. If soilborne disease is severe or reappears, area should be retreated 3 to 4 weeks later. Be sure grass is dry when granular Turfcide is applied.

For Bluegrass, Fescue, Ryegrass and similar grasses, Turfcide 10G can be safely applied at 2 to 2½ lbs formulation per 1000 sq ft at first indication of infected root systems. If disease is severe, treatment may need to be repeated every 7 to 10 days during warm, humid weather. Following the application of Turfcide 10G, treated area should be watered to wash chemical from the grass and move it into soil. Be sure grass is dry when granular Turfcide is applied.

Note: Under certain growing conditions, a temporary discoloration of the grass may occur. This causes no harm and will disappear in a short time.

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