

DISEASE CONTROL

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Diseases are primary limiting factors to the successful culture of cool and warm season turfgrasses in South Carolina. The wide range of microclimates in the state allow culture of a wide variety of turfgrasses, but frequently the humid conditions allow disease development. Warm season grasses also come under stress from cold temperatures in transition zone habitats. Fortunately, grasses receiving proper cultural practices including proper irrigation, mowing, and fertilizing are less likely to develop diseases and are not as likely to be seriously damaged if a disease occurs. By enhancing plant vigor, diseases will be minimized and the need for the use of costly fungicides will be reduced. If used, alternate between classes of fungicides to prevent development of fungicide-resistant pathogens. NOTE: Products containing chlorothalonil, iprodione and vinclozolin are no longer labeled for use on home lawns.

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|--|--|--|--|--|-----------------------------|
| Algae (various species; primarily blue-green algae or cyanobacteria) All grasses Most prevalent on putting greens & other turf mowed excessively low. | Turf areas in partially shaded, damp locations become weak and begin to thin. Traffic and close-mowing enhance potential for algae development. Long-term overcast, rainy weather periods encourage algae on putting greens. These algae are commonly green or brown in color and can be sheet-like, leaf-like, or cushion-like in appearance. Due to their high water content, algae are often quite slippery. Algae growth may become so prolific that they cover turf plants and inhibit water penetration. | Improve air circulation and light exposure. Improve drainage and reduce irrigation frequency and amount. Reduce freely available nitrogen at site. On putting greens, verticut lightly, aerify, and/or topdress to disrupt and dry algal mats. Best results are with 5 gal water per 1,000 sq.ft. applied for 3 consecutive weeks when air temps. are at least 85 F. | chlorothalonil 54%F | 2-3.6 fl oz | 7-14 preventive |
| | | | 2-3.6 fl oz | 7-14 curative | |
| | | | 4-5.5 fl oz | 14 curative | |
| | | | chlorothalonil 38.54% F | 2.9-5.1 fl oz | 7-14 preventive |
| | | | 2.9-5.1 fl oz | 7-14 curative | |
| | | | 5.8-7.9 fl oz | 14 curative | |
| | | | chlorothalonil 82.5%WDG, DF | 1.8-3.2 oz | 7-14 preventive |
| | | | 1.8-3.2 oz | 7-14 curative | |
| | | | 3.6-5 oz | 14 curative | |
| | | | chlorothalonil + thiophanate methyl 90WDG | 2-5.76 | 7-14 |
| | | | mancozeb 80WP | 6 oz | 7-14 |
| | | | mancozeb 75DF | 6 oz | 7 |
| | | | mancozeb 37%F | 9.6 fl oz | 7-14 |
| mancozeb (15%) + copper hydroxide(46%) | 4-8 oz | 7-14 | | | |
| copper hydroxide 53.8% | 16 oz in 5 gal water | variable | | | |
| maneb (37%)+ zinc F | 9.6 fl oz | 7-14 | | | |
| <i>note:</i> chlorothalonil formulations have maximum use rates in effect that depends on site - see new labels for details. <i>note:</i> fungicides are most effective when used preventative. Fungicides containing copper hydroxide may be phytotoxic; read label carefully and use precautions. | | | | | |
| Anthracnose leaf blight and Anthracnose basal rot <i>(Colletotrichum graminicola)</i> | The causal fungus can infect leaves, sheaths, and tillers. In creeping bentgrass and <i>Poa annua</i> , stolons and crowns also may be rotted (anthracnose basal rot). Leaf infection appears as reddish-brown to brown lesions that are often surrounded by a yellow halo. Lesion size may span the blade width and often one lesion will cause | Avoid stressed turf caused by consistent low mowing and rolling of greens, other pests, fertility imbalances, or moisture extremes. Thatch removal will be helpful. In bentgrass greens, manage | azoxystrobin 50WDG | 0.2-0.4 oz | 14-28 |
| | | | azoxystrobin 8.8% MEC | 1-2 fl oz. | 14-28 |
| | | | azoxystrobin (5.73%) + propiconazole (9.54%) | 1.5-3.0 fl oz | 14-28 |
| | | | chlorothalonil 38.5%F | 4.3-5.1 fl oz. | 7-14 pre-disease |
| | | | >5.1-7.9 | 14 pre-disease | |
| chlorothalonil 54% F | 3-3.6 fl oz | 7-14 pre-disease | | | |
| >3.6-5.5 | 14 pre-disease | | | | |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|---|--|--|---|--|-----------------------------|
| All grasses | complete yellowing of a blade. Tiller infection results in stem girdling and the subsequent appearance of small, yellow patches of turf. The causal fungus can sometimes be observed with a hand lens. It will appear as dark, cushion-like reproductive structures (acervuli) with black spines (setae) extending from the margin of the cushion. Plants with anthracnose basal rot may have deep-seated infections that are not readily diagnosed with only a hand lens. | localized dry spots to prevent anthracnose basal rot from developing. | chlorothalonil 82.5% WDG | 2.7-3.2 oz | 7-14 pre-disease |
| | | | | >3.2-5 oz | 14 pre-disease |
| | | | fenarimol AS | 1.75-3.5 fl oz | 30 |
| | | | polyoxin 2.5 WP | 4.0 | 7-14 |
| | | | propiconazole 14.3% | 1-2 fl oz | 14-28 |
| | | | myclobutanil 40%WSP | 0.6 | 14-21 |
| | | | myclobutanil 20 EW | 1.2 fl oz | 14-21 |
| | | | triadimefon 50 WSP | 1.0 oz | 30 |
| | | | trifloxystrobin 50WDG | 0.15-0.25 oz | 14-21 |
| | | | trifloxystrobin + triadimefon 2.4 L | 1-2 fl oz | 14-28 |
| | | | trifloxystrobin + triadimefon 50WP | 0.6-1.2 oz | 14-28 |
| | | | chlorothalonil + thiophanate methyl 67WDG | 2-8 oz | 7-14 |
| | | | chlorothalonil + thiophanate methyl 90WDG | 3.72-5.76 | 7-14 |
| | | | mancozeb + thiophanate methyl | 3 oz | 5-14 |
| | | | pyraclostrobin 20 WDG | 0.5-0.9 oz | 14-28 |
| | | | thiophanate methyl 50WSB | 1-2 oz | 10-14 |
| | | | thiophanate methyl 46%F | 1-2 fl oz | 10-14 |
| thiophanate-methyl 41%F | 2-8 fl oz | 7-14 | | | |
| thiophanate methyl 50WP | 2-8 oz | 7-14 | | | |
| | | | <i>note:</i> chlorothalonil formulations have new maximum use rates in effect that depends on site - see new labels for details. | | |
| | | | <i>note:</i> on bentgrass greens, be cautious when utilizing , propiconazole, fenarimol, triadimefon or myclobutanil at high rates in high heat conditions as unacceptable growth regulation may occur. | | |
| Brown Patch, Rhizoctonia Blight (<i>Rhizoctonia solani</i>) bluegrass creeping bentgrass fescues ryegrass | Grass is killed in circular to irregular areas that may expand to several feet in diameter. In close-cut cool season grasses, a darkened “smoke ring” border may be apparent. Brown patch in cool season grasses occurs during humid weather at >75°F. High N, thatch buildup, and excessive moisture favor disease. | Maintain adequate fertility. Avoid excess fast-release nitrogen. Irrigate deeply. Reduce thatch. | azoxystrobin 50%WG | 0.2-0.4 | 14-28 |
| | | | azoxystrobin 8.8% MEC | 1-2 fl oz. | 14-28 |
| | | | azoxystrobin (5.73%) + propiconazole (9.54%) | 1.5-3.0 fl oz | 14-28 |
| | | | chloroneb 65WP | 5 oz | 21-28 |
| | | | chlorothalonil 54.0%F | 2-3.6 fl oz | 7-14 pre-disease |
| | | | | 4-5.5 fl oz | 14 post-disease |
| | | | chlorothalonil 38.5%F | 2.9-5.1 fl oz | 7-14 pre-disease |
| | | | | 5.8-7.9 fl oz | 14 post-disease |
| | | | chlorothalonil 82.5% WG | 1.8-3.2 oz | 7-14 pre-disease |
| | | | | 3.6-5 oz | 14 post-disease |
| | | | chlorothalonil + thiophanate methyl 67WDG | 2-8 oz | 7-14 |
| | | | chlorothalonil + thiophanate methyl 90WDG | 3.72-5.76 | 7-14 |
| | | | fenarimol 11.6% AS | 1.5 fl oz | 7-14 |
| | | | fludioxonil 50%WP | 0.25 -0.5 oz | 7-14 |
| | | | flutolanil 50%WP | 2-3 oz | 14-21 |
| | | | flutolanil 70%WP | 1.5-3 oz | 14-21 |
| | | | iprodione 50%WP | 1.5-2 oz | 14-28 |
| iprodione 23.3%F | 3-4 fl oz | 14-28 | | | |
| mancozeb 37%F | 6.4 fl oz | 7 | | | |
| mancozeb 80%WP | 4 oz | 7 | | | |
| mancozeb 75%DF | 4 oz | 7 | | | |
| | | | <i>note:</i> chlorothalonil formulations have new maximum use rates that depend on site - see new labels for details | | |
| | | | <i>note:</i> Fungicides containing copper hydroxide may be phytotoxic; read label carefully & use precautions. | | |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|---|---|--|---|--|-----------------------------|
| | | | maneb (37%)+ zinc F | 4.8 fl oz | 7-14 |
| | | | myclobutanil 40% | 0.6 | 14 |
| | | | myclobutanil 20 EW | 1.2 fl oz | 14 |
| | | | polyoxin 2.5 WP | 4 oz | 7-14 |
| | | | PCNB 75%WP | 3-4 oz | 7-10 |
| | | | PCNB 10%G | 2-2.5 lb | 7-10 |
| | | | PCNB 15%G | 1.5-2 lb | 7-10 |
| | | | PCNB 40F | 4.5-6 fl oz | 7-10 |
| | | | propiconazole 14.3% | 1-2 fl oz | 14-21 |
| | | | pyraclostrobin 20 WDG | 0.5-0.9 oz | 14-28 |
| | | | thiophanate methyl 50WSB | 2 oz | 5-14 |
| | | | thiophanate methyl 46%F | 1-2 fl oz | 5-14 |
| | | | thiophanate methyl 50%WP | 2-4 oz | 7-14 |
| | | | thiophanate methyl 41%F | 2-4 fl oz | 7-14 |
| | | | thiram 75%WDG | 2.5-5 oz | 7-10 |
| | | | triadimefon 50%WSP | 0.5-1.0 oz | 15-30 |
| | | | vinclozolin 50 WG or DF | 1-2 oz | 14-28 |
| | | | trifloxystrobin 50%WDG | 0.1-0.25 oz | 14-21 |
| | | | trifloxystrobin + triadimefon 2.4L | 1-2 fl oz | 14-28 |
| | | | trifloxystrobin + triadimefon 50WP | 0.6-1.2 oz | 14-28 |
| | | | mancozeb (15%) + copper hydroxide(46%) | 4-8 oz | 7-14 |
| Bentgrass Dead Spot (<i>Ophiosphaerella agrostis</i>) | Small, copper-colored spots appear in mild weather, in open, exposed areas. Spots become gray to tan as grass is killed. Spots are circular and generally do not coalesce. | Encourage turf recovery with acidifying fertilizers. If spots are few, plug out and replace with healthy turf. | azoxystrobin (5.73%) + propiconazole (9.54%) | 1.5-3.0 fl oz | 14-28 |
| Creeping bentgrass | Spots expand slowly up to the size of a softball. Tiny black pseudothecia fruiting bodies may be visible with a hand lens. | | boscalid 70WDG | 0.18 oz | 14 |
| Bermudagrass | | | fludioxonil 50% WP | 0.3-0.5 oz | 14 |
| | | | pyraclostrobin 20 WDG | 0.5-0.9 oz | 14-28 |
| | | | thiophanate methyl 41%F | 4-8 fl oz | 7-14 |
| | | | thiophanate methyl 50WP | 4-8 oz | 7-14 |
| | | | chlorothalonil + thiophanate methyl 90WDG | 3.72-5.76 | 7-14 |
| Cercospora Leaf Spot (<i>Cercospora fusimaculans</i>) | Brown to purple leaf spots in patches 2-3" in diameter. In high disease severity, entire leaves will yellow, wither and die. Warm, humid weather favors disease incidence. Confused with gray leaf spot. | N may reduce disease. Water deeply only when needed in mornings. 'Bitter-blue' selections are more resistant. | None available. Fungicides used to control other leaf spot diseases will provide suppression. | | |
| St. Augustinegrass | | | | | |
| Curvularia Blight (<i>Curvularia</i> spp.) | Usually associated with stressed plants from heat, excess moisture, drought, compaction, or other causes. Bentgrass greens may develop yellow patches of 2-6 inches in diameter or greater when under high heat stress. The turf may thin slightly, but usually does not die from this disease. | Alleviate stress conditions that may occur. | thiophanate methyl 41%F | 4-8 fl oz | 7-14 |
| All turfgrasses | | | thiophanate methyl 50WP | 4-8 oz | 7-14 |
| Dollar Spot (<i>Sclerotinia homoeocarpa</i>) | On fine textured grasses, spots appear 1-2" in diameter. On tall or coarse grasses, patches may reach 5 or more inches in diameter. Often, straw-colored lesions | Avoid N deficiency. Irrigate in morning. Avoid thatch buildup. Wipe heavy dew off in | azoxystrobin (5.73%) + propiconazole (9.54%) | 1.5-3.0 fl oz | 14-28 |
| | | | boscalid 70WDG | 0.13-0.18 oz | 14-28 |
| | | | chlorothalonil 54.0%F | 1-2 fl oz | 7-10 pre-disease |
| | | | | 2-3.6 fl oz | 7-21 pre-disease |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|--|--|--|--|--|-----------------------------|
| bahiagrass bermudagrass centipedegrass creeping bentgrass ryegrass rough bluegrass St. Augustinegrass tall fescue zoysiagrasses | move in from leaf margins or occur as distinct bands across the leaf. Most active during 60-80°F in spring and fall. Moisture from fog, dew, or irrigation initiate disease. Low soil moisture, thatch, low N and K favor disease. <i>note:</i> chlorothalonil formulations have new maximum use rates in effect that depends on site - see new labels for details. <i>note:</i> Fungicides containing copper hydroxide may be phytotoxic; read label carefully and use precautions. | mornings. | chlorothalonil 38.5%F | 4-5.5 fl oz | 14 post-disease |
| | | | | 1.4-2.9 fl oz | 7-10 pre-disease |
| | | | | 2.9-5.1 fl oz | 7-21 pre-disease |
| | | | | 5.8-7.9 fl oz | 14 post-disease |
| | | | chlorothalonil 82.5% WG | 0.9-1.8 oz | 7-10 pre-disease |
| | | | | 1.8-3.2 oz | 7-21 pre-disease |
| | | | | 3.6-5 oz | 14 post-disease |
| | | | chlorothalonil + thiophanate methyl 67WDG | 2-8 | 7-21 |
| | | | chlorothalonil + thiophanate methyl 90WDG | 2-5.76 | 7-14 |
| | | | fenarimol 11.6%AS | 0.75-1.5 fl oz | 10-28 |
| | | | iprodione 23.3%F | 3-4 | 14-28 |
| | | | iprodione 50WP | 1.5-2 | 14-28 |
| | | | mancozeb 75DF | 6-8 oz | 7-14 |
| | | | mancozeb 80WP | 6-8 oz | 7-14 |
| | | | mancozeb 37%F | 9.6-12.8 fl oz | 7-14 |
| | | | mancozeb (15%) + copper hydroxide(46%) | 4-8 oz | 7-14 |
| | | | maneb (37%)+ zinc F | 9.6-12.8 fl oz | 7-14 |
| | | | myclobutanil 40WSP | 0.5-1.2 oz | 14-28 |
| | | | myclobutanil 20 EW | 1.2 fl oz | 14-28 |
| | | | PCNB 75%WP | 7-10 oz | 28 |
| | | | PCNB 10G | 5-7.5 lb | 28 |
| | | | PCNB 15G | 3.3-5 lb | 28 |
| | | | PCNB 40F | 3 fl oz | 14 |
| | | | propiconazole 14.3% | 0.5-2 fl oz | 7-28 |
| | | | pyraclostrobin 20WDG | 0.9 | 14 (suppression only) |
| | | | triadimefon 50WSP | 0.25-1 oz | 14-30 |
| | | | trifloxystrobin + triadimefon 2.4L | 1-2 fl oz | 14-28 |
| | | | trifloxystrobin + triadimefon 50WP | 0.6-1.2 oz | 14-28 |
| thiophanate methyl 50WSB | 1-2 oz | 7-14 | | | |
| thiophanate methyl 46%F | 1-2 fl oz | 10-14 | | | |
| thiophanate methyl 50WP | 2-4 oz | 7-14 | | | |
| thiophanate methyl 41%F | 2-4 fl oz | 7-14 | | | |
| thiram 75WDG | 2.5-5 oz | 7-10 | | | |
| vinclozolin 50WP or DF | 2 oz | 14-28 | | | |
| Fairy Ring (<i>Agrocybe</i> , <i>Chlorophyllum</i> , <i>Lycoperdon</i> , <i>Marasmius</i> , <i>Tricholoma</i> spp., + other mushroom fungi). All grasses | Irregularly sized circular to semi-circular bands of lush green turf become apparent. Turf within circular area may decline, turn brown and thin. Toxins may be involved, but hydrophobic soil is a major problem. Mushrooms may be associated with the rings. Rings may persist for years. | Difficult to control. Plugging or aerating to allow more water and fertilizer to reach the roots may help. Some surfactants have helped water penetration. | azoxystrobin 50WDG (suppression of rings induced by <i>Lycoperdon</i> , <i>Agrocybe</i> , & <i>Bovista</i> sp.) | 0.4 oz | 28 |
| | | | azoxystrobin 8.8% MEC | 2 fl oz. | 28 |
| | | | azoxystrobin (5.73%) + propiconazole (9.54%) | 3.0 fl oz | 28 |
| | | | flutolanil 50WP | 6 oz | 30 |
| | | | flutolanil 70WP | 2.2-4.5 oz | 21-30 |
| | | | flutolanil + thiophanate methyl 80WDG | 3-6.12 | 21-28 |
| | | | pyraclostrobin 20WDG | 0.9 oz | 28 |
| Fusarium Patch and Pink Snow Mold | Fusarium Patch: Begins in late fall and early winter in wet, humid weather as | Avoid excess nitrogen fertilization, irrigate | azoxystrobin 50WDG | 0.2-0.4 | 14-28 |
| | | | azoxystrobin 8.8% MEC | 1-2 fl oz. | 14-28 |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|--|--|--|--|--|---------------------------------|
| <i>(Microdochium nivale)</i> Cool season grasses are mostly affected, including bentgrass, bluegrasses, ryegrasses, and fescues | small, water-soaked spots of 2 inches up to 8 inches in diameter. Patches may appear wet or slimy. Gray to pinkish colored mycelium may be noticeable in patches. Snow is not required for development of Fusarium Patch. The disease may kill grasses in these patches; frequently misdiagnosed as cool weather Pythium. Pink Snow Mold: Same causal agent as Fusarium Patch, but the disease occurs under snow cover. Preventive fungicide applications must be made prior to persistent snow cover. <i>note:</i> chlorothalonil formulations have new maximum use rates in effect that depends on site - see new labels for details. <i>note:</i> Fungicides containing copper hydroxide may be phytotoxic; read label carefully and use precautions. | infrequently but thoroughly, avoiding light frequent irrigations. Protect newly seeded areas that are highly susceptible. Reduce shade and increase air movement around greens. | azoxystrobin (5.73%) + propiconazole (9.54%) | 1.5-3.0 fl oz | 14-28 |
| | | | chlorothalonil 54%F | 5.5 fl oz | 21-28 pre-disease |
| | | | chlorothalonil 38.5%F | 7.9 fl oz | 21-28 pre-disease |
| | | | chlorothalonil 82.5%WDG | 5 oz | 21-28 pre-disease |
| | | | chlorothalonil + thiophanate methyl 67WDG | 6-8 oz | Single application |
| | | | chlorothalonil + thiophanate methyl 90WDG | 3.72-5.76 oz | 7-14 |
| | | | fenarimol 11.6%AS | 8 fl oz | 1-2 applications |
| | | | fludioxonil 50%WP | 0.5 oz | late fall before snow |
| | | | iprodione 23.3%F | 4-8 fl oz | 14-21 |
| | | | iprodione 50WP | 2-4 oz | 14-21 |
| | | | mancozeb 75DF | 6-8 oz | 2-6 wk |
| | | | mancozeb 80WP | 6-8 oz | 14-42 |
| | | | mancozeb 37%F | 9.6-12.8 oz | 14-42 |
| | | | maneb (37%)+ zinc F | 9.6-12.8 fl oz | 14-42 |
| | | | mancozeb (15%) + copper hydroxide(46%) | 4-8 oz | 7-14 |
| | | | myclobutanil 20 EW | 1.2-2.4 fl oz | Fall/winter prior to snow cover |
| | | | polyoxin 2.5 WP | 4 oz | 7-14 |
| | | | PCNB 75%WP | 8 oz | 4-6 wk |
| | | | PCNB 10G | 3-5 lb | 4-6 wk |
| | | | PCNB 15G | 2-3.3 lb | 4-6 wk |
| | | | PCNB 40F | 3 fl oz | 14 |
| | | | propiconazole 14.3% | 2-4 oz | Single application |
| | | | pyraclostrobin 20WDG | 0.5-0.9 oz | 14-28 |
| | | | triadimefon 50WSP | 1-2 oz | 5-14 |
| | | | thiophanate methyl 46%F | 1-2 fl oz | 5-14 |
| | | | thiophanate methyl 50WSB | 2 oz | 7-14 |
| | | | thiophanate methyl 50WP | 2-4 oz | 7-14 |
| thiophanate methyl 41%F | 2-4 fl oz | fall/early spring | | | |
| trifloxystrobin 50WG | 0.2-0.25 | 10-21 | | | |
| trifloxystrobin+ triadimefon 2.4L | 2 fl oz | fall/ early spring | | | |
| trifloxystrobin + triadimefon 50WP | 1.2 oz | fall/ early spring | | | |
| vinclizolin 50WP or DF | 2-4 oz | 14-42 | | | |
| Gray Leaf Spot <i>(Pyricularia grisea)</i> | Small brown to ash-colored leaf spots with purple to brown margins. Lesions become covered with the gray, velvety, fungal mycelium of <i>Pyricularia grisea</i> . In severe cases leaves appear scorched. Prevalent during rainy, summer months. Mainly on St. Augustinegrass, but recently epidemics have occurred on tall fescue and perennial ryegrass. | Avoid excess N. Irrigate deeply in early morning. Reduce traffic. Mostly a problem on newly planted St. Augustinegrass, especially in shade, or atrazine-treated St. Augustinegrass. | azoxystrobin 50WG ; no more than 2 sequential sprays | 0.2-0.4 oz | 14-28 |
| bahigrass bermudagrass centipedegrass ryegrass St. Augustinegrass tall fescue | | | azoxystrobin 8.8% MEC | 1-2 fl oz | 14-28 |
| | | | azoxystrobin (5.73%) + propiconazole (9.54%) | 1.5-3.0 fl oz | 14-28 |
| | | | chlorothalonil 54%F | 2-3.6 fl oz | 7-10 pre-disease |
| | | | | 4-5.5 fl oz | 14 post-disease |
| | | | chlorothalonil 38.5%F | 2.9-5.1 fl oz | 7-10 pre-disease |
| | | | | 5.8-7.9 fl oz | 14 post-disease |
| | | | chlorothalonil 82.5%WDG | 1.8-3.2 oz | 7-10 pre-disease |
| | | | | 3.6-5 oz | 14 post-disease |
| | | | chlorothalonil + fenarimol | 3 oz | 7-10 |
| chlorothalonil + thiophanate methyl 67WDG | 2-8 | 7-14 | | | |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|--|---|---|--|--|-----------------------------|
| | | | chlorothalonil + thiophanate methyl 90WDG | 3.72-5.76 | 7-14 |
| | | | mancozeb 80WP | 8 oz | 14 |
| | | | mancozeb 75DF | 8 oz | 14 |
| | | | mancozeb 37%F | 12.8 fl oz | 14 |
| | | | mancozeb + thiophanate methyl | 3-9 fl oz | 7-14 |
| | | | polyoxin 2.5 WP | 4 oz | 7-14 |
| | | | propiconazole 14.3% | 1-2 fl oz | 14 |
| | | | pyraclostrobin 20WDG | 0.5-0.9 oz | 14-28 |
| | | | thiophanate methyl 50WSB | 4-8 oz | 10-14 |
| | | | thiophanate methyl 41%F | 4-8 fl oz | 7-14 |
| | | | thiophanate methyl 50WP | 4-8 oz | 7-14 |
| | | | triadimefon 50WSP | 0.5-1 oz | 14 |
| | | | trifloxystrobin 50WDG | 0.15-0.25 oz | 14-21 |
| | | | trifloxystrobin + triadimefon 2.4L | 1-2 fl oz | 14-28 |
| | | | trifloxystrobin + triadimefon 50WP | 0.6-1.2 oz | 14-28 |
| "Helmintho-sporium" Leaf Spot (<i>Bipolaris</i> , <i>Drechslera</i> spp.) | Symptoms include leaf spotting and 'melting-out' phases. Leaves have circular to elongated, purplish or brown spots with straw-colored centers on older lesions. Numerous lesions cause leaves to turn reddish-brown, then yellow, and die. | Maintain a balanced fertility. Irrigate deeply in the mornings. Raise mower height during disease outbreaks. Reduce thatch. | azoxystrobin 50WDG | 0.2-0.4 | 14-21 |
| bahiagrass | Sheath and crown rot may be present. | | azoxystrobin 8.8% MEC | 1-2 fl oz. | 14-21 |
| bermudagrass | Ryegrass, bluegrasses (<i>Poa pratensis</i> and <i>P. trivialis</i>) and bermudagrass are most susceptible. Most prevalent when temperatures range from 68-95°F during mild periods of spring and fall. | | azoxystrobin (5.73%) + propiconazole (9.54%) | 1.5-3.0 fl oz | 14-28 |
| bluegrass | | | chlorothalonil 54.0%F | 2 fl oz | 7-10 pre-disease |
| creeping bentgrass | | | | 2-3.6 fl oz | 7-21 post-disease |
| ryegrass | | | | 4-5.5 fl oz | 14 post-disease |
| St. Augustinegrass | | | chlorothalonil 38.5%F | 2.9 fl oz | 7-10 pre-disease |
| zoysiagrasses | | | | 2.9-5.1 fl oz | 7-21 post-disease |
| | | | | 5.8-7.9 fl oz | 14 post-disease |
| | | | chlorothalonil 82.5% WDG | 1.8 oz | 7-10 pre-disease |
| | | | | 1.8-3.2 oz | 7-21 post-disease |
| | | | | 3.6-5 oz | 14 post-disease |
| | note: chlorothalonil formulations have new maximum use rates in effect that depends on site - see new labels for details. | | chlorothalonil + thiophanate methyl 67WDG | 2-8 | 7-14 |
| | note: Fungicides containing copper hydroxide may be phytotoxic; read label carefully and use precautions. | | chlorothalonil + thiophanate methyl 90WDG | 2-5.76 | 7-14 |
| | | | fludioxonil 50%WP | 0.25-0.5 oz | 14-21 |
| | | | iprodione 50WP | 1.50-2 oz | 14-28 |
| | | | iprodione 23.3%F | 3-4 fl oz | 14-28 |
| | | | mancozeb + thiophanate methyl | 3 | 5-14 |
| | | | mancozeb 80WP | 4 | 7-14 |
| | | | mancozeb 75DF | 4 oz | 7-14 |
| | | | mancozeb 37%F | 6.4 fl oz | 7-14 |
| | | | mancozeb (15%) + copper hydroxide(46%) | 4-8 oz | 7-14 |
| | | | maneb (37%)+ zinc F | 4.8-6.4 fl oz | 7-14 |
| | | | myclobutanil 40WDG | 0.6 oz | 14 |
| | | | myclobutanil 20 EW | 1.2 fl oz | 14 |
| | | | PCNB 75WP | 7-10 | 21-28 |
| | | | PCNB 10G | 5-7.5 lb | 21-28 |
| | | | PCNB 15G | 3.3-5 lb | 21-28 |
| | | | PCNB 40F | 10.5-15 fl oz | single application |
| | | | polyoxin 2.5 WP | 4 oz | 7-14 |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|--|--|---|---|--|--|
| | | | propiconazole 14.3% | 1-2 fl oz | 14 |
| | | | pyraclostrobin 20WDG | 0.5-0.9 oz | 14-28 |
| | | | thiophanate methyl 50WP | 4-8 oz | 7-14 |
| | | | thiophanate methyl 41%F | 4-8 fl oz | 7-14 |
| | | | trifloxystrobin 50WDG | 0.1-0.25 oz | 14-28 |
| | | | trifloxystrobin + triadimefon 2.4L | 1-2 fl oz | 14-28 |
| | | | trifloxystrobin + triadimefon 50WP | 0.6-1.2 oz | 14-28 |
| | | | vinclozolin 50WP or DF | 1-2 oz | 12-28 |
| Large Patch (brown patch in warm season grasses; Zoysia patch , large patch of zoysia) (<i>Rhizoctonia solani</i> AG 2, 2 LP) | With Large Patch disease of warm season grasses, leaf fascicles pull easily from plant due to rot at leaf base. Initial infections are in the fall, but symptoms are usually most apparent in the spring as grasses emerge from winter dormancy. | Maintain adequate fertility. Avoid excess fast-release nitrogen. Irrigate deeply. Reduce thatch. Correct compaction and areas of poor drainage. | azoxystrobin 50WDG | 0.4 | 14-28 (1, 2 or 3 application in fall) |
| | | | azoxystrobin 8.8% MEC | 1-2 fl oz. | 14-28 |
| | | | chloroneb 65 WP | 5 oz | 21-28 |
| | | | flutolanil 50WP | 3 oz | 30 |
| | | | flutolanil 70WP | 2.2 oz | 30 |
| | | | triadimefon 50%WSP | 1-2 oz | First application in early fall, follow in spring if necessary |
| zoysiagrass bermudagrass St. Augustinegrass Centipedegrass Seashore Paspalum | | | iprodione 23.3% F | 4.0 fl oz | First application in fall, repeat in spring |
| | | | iprodione 50WP | 2.0 oz | 14-21 |
| | | | myclobutanil 40WDG | 1.2 oz | Apply in fall before dormancy, repeat 28 days |
| | | | myclobutanil 20 EW | 2.4 fl oz | Apply in fall before dormancy, repeat 28 days |
| | | | polyoxin 2.5 WSP | 4 oz | 7-14 |
| | | | PCNB 75%WP | 16 oz | 28 |
| | | | PCNB 10G | 7.5 lb | 28 |
| | | | PCNB 15G | 5 lb | 28 |
| | | | PCNB 40F | 16-24 fl oz | 28 |
| | | | propiconazole 14.3% | 3-4 fl oz | 1 application in early fall, prior to symptoms |
| | | | thiophanate methyl 41%F | 2-4 fl oz | 7 to 14 |
| | | | thiophanate methyl 50WP | 2-4 oz | 7 to 14 |
| Powdery Mildew (<i>Blumeria graminis</i>) | White, powdery like growth on the upper and lower leaf surfaces of grasses. The disease is most common in excessively shaded areas with high humidities. | Improve sunlight penetration and air movement or landscape the area with non-turfgrass plants that are shade tolerant. | azoxystrobin 50WDG | 0.2-0.4 | 14-28 |
| | | | azoxystrobin 8.8% MEC | 1-2 fl oz. | 14-28 |
| | | | fenarimol AS | 2-4 fl oz. | Single application |
| | | | myclobutanil 40WDG | 0.6 oz | 14-28 |
| | | | myclobutanil 20 EW | 1.2 fl oz | 14-28 |
| | | | propiconazole 14.3% | 1-2 fl oz | 14-28 |
| | | | triadimefon 50WP | 1-2 oz | 15-30 |
| Pythium Blight (<i>Pythium</i> spp.) | Grass dies in spots or streaks. Initially, the affected grass has a dark color and a greasy | Improve aeration and drainage. Avoid frequent, | azoxystrobin 50WG; no more than 2 sequential sprays | 0.4 oz | 10-14 |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|--|---|---|---|---|--|
| All grasses | appearance, particularly in spots. Spots may develop a copper color and eventually a bleached, straw color as affected tissues die and dry. After prolonged moist or foggy periods, the cottony mycelium may be seen on the turf (note: this symptom is NOT always evident). Pythium can be spread by foot traffic or mowers passing over infected grasses. Occurs during warm, humid, foggy weather in poorly drained soils. Ryegrass, rough bluegrass, and bentgrass used for overseeding are most susceptible. | shallow irrigation. Reduce mowings and minimize equipment or foot traffic across infected turf. Wash equipment that passes from infected to non-infected grass areas. | azoxystrobin 8.8% MEC; no more than 2 sequential sprays chloroneb 65WP ethazole 30WP ethazole 35WP fosetyl AI 80WDG metalaxyl 25.1% E metalaxyl 1.21%G mefenoxam 21.3% MC mefenoxam 43.6% WSP mancozeb 80WP mancozeb 75DF mancozeb 37%F mancozeb + metalaxyl mancozeb (15%) + copper hydroxide(46%) maneb (37%)+ zinc F pyraclostrobin 20 WDG propamocarb 66.5L phosphorous acid salts | 1-2 fl oz. 4 oz 2-5 oz 2-5 oz 4-8 oz 1-2 fl oz 12.5 oz 0.5-1 fl oz 0.11-0.56 8 oz 8 oz 12.8 fl oz 6.4 oz 4-8 oz 12.8 fl oz 0.5-0.9 oz 1.3-4 5-10 | 10-14 5-7 5-10 5-10 14-21 10-21 10-21 10-21 5 5 5 7-21 5 5 14-28 7-21 7-14 |
| <i>To minimize the potential for resistance, alternate between classes of fungicides.</i> | | | | | |
| <i>Note:</i> Fungicides containing copper hydroxide may be phytotoxic; read label carefully & use precautions. | | | | | |
| Pythium Root Rot (<i>Pythium</i> spp.) | Roots are off color, tan or light brown, water-soaked appearance with few or no feeder roots present. Sometimes, new roots may be initiated from crown regions as older roots become diseased. Root rot is favored in poorly drained or continuously wet soils. Areas will appear chlorotic and be less vigorous in growth, but usually do not die. Can occur year around, especially on over-irrigated sites. | Avoid overwatering. Aerate compacted and poorly drained soils. Foliar fertilizer treatments may be useful. | azoxystrobin 50WG; no more than 2 sequential sprays azoxystrobin 8.8% MEC; no more than 2 sequential sprays fosetyl AI 80WDG chloroneb 65WP ethazole 30WP phosphorous acid salts | 0.4 2 fl oz. 4-8 oz 4 2-5 5-10 | 10-14 10-14 14-21 5-7 7-14 7-14 |
| All grasses | | | Water into the root-zone. Only azoxystrobin, ethazole, fosetyl AI formulations have Pythium Root Rot on the label. | | |
| <i>To minimize the potential for resistance, alternate between classes of fungicides.</i> | | | | | |
| Rapid Blight (<i>Labyrinthula terrestris</i>) | Patches from a few inches up to a foot in diameter occur most commonly in salinity-stressed cool season grasses. Affected turf can be chlorotic and water-soaked. Individual leaves appear blotchy. The organism does not form a mycelium. | Manage salinity by core aeration, gypsum applications and leaching regime | mancozeb 80WP pyraclostrobin 20 WDG trifloxystrobin 50 WDG | 8 oz 0.5-0.9 oz 0.15-.25 oz | 14 14-28 14-21 |
| Red Thread (<i>Laetisaria fuciformis</i>) | In winter and early spring, leaf tips appear shriveled and ragged, occurring in patches up to 6 inches in diameter. Red to orange-colored fungal “threads” appear to grow from affected leaf tips. Turf appears as if it has been cut with a dull rotary mower. The disease is favored by cloudy, cold, | Maintain adequate fertility, and avoid transient drought conditions. Mow frequently at the correct cutting height. | azoxystrobin 50WDG azoxystrobin 8.8% MEC chlorothalonil 54.0%F chlorothalonil 38.5%F | 0.2-0.4 1-2 fl oz. 2-3.6 fl oz >3.6-5.5 fl oz 5.5 fl oz 2.9-5.1 fl oz >5.1-7.9 fl oz | 14-28 14-28 7-10 pre-disease 14 post-disease 14 post-disease 7-10 pre-disease 14 post-disease |
| fescues and ryegrasses | | | | | |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|---|---|---|--|--|---|
| | humid weather. | | chlorothalonil 82.5%WDG | 7.9 fl oz 1.8-3.2 oz >3.2-5 oz 5 oz | 14 post-disease 7-10 pre-disease 14 post-disease 14 post-disease |
| | <i>Note:</i> chlorothalonil formulations have new maximum use rates in effect that depends on site - see new labels for details. | | fenarimol AS flutolanil 50WP flutolanil 70WP iprodione 50WP iprodione 23.3%F mancozeb 80WP mancozeb 75DF mancozeb 37%F mancozeb (15%) + copper hydroxide(46%) maneb (37%)+ zinc F myclobutanil 40%WSP myclobutanil 20 EW polyoxin 2.5 WSP propiconazole 14.3% pyraclostrobin 20WDG thiophanate methyl 50WSB thiophanate methyl 50WP thiophanate methyl 41%F triadimefon 50WSP trifloxystrobin 50WDG trifloxystrobin + triadimefon 2.4L trifloxystrobin + triadimefon 50WP vinclozolin 50WP or DF | 8 fl oz 2 oz 1.5 oz 2 oz 4 fl oz 4-8 oz 4-8 oz 6.4-12.8 fl oz 4-8 oz 6.4-12.8 fl oz 0.6 1.2 fl oz 4 oz 2 fl oz 0.5-0.9 oz 2 oz 2-4 oz 2-4 fl oz 0.5-1 oz 0.1-0.25 oz 1-2 fl oz 0.6-1.2 oz 1-2 oz | 30 21-28 21-28 14 14 7-14 7-14 7-14 7-14 14-21 14-21 7-14 14-21 14-28 5-14 7-14 7-14 15-30 14-21 14-28 14-28 14-28 |
| Rust (<i>Puccinia</i> and <i>Uromyces</i> spp.) | Small yellow to orange or reddish-brown pustules on the leaves. Heavily infected area appears thin and chlorotic. Ryegrass and zoysiagrasses are most susceptible. Humid weather following a drought period favors epidemics. | Plant resistant or tolerant varieties. Maintain growth by fertilizing and irrigating adequately. Mow frequently and remove clippings. | azoxystrobin 50WDG azoxystrobin 8.8% MEC azoxystrobin (5.73%) + propiconazole (9.54%) chlorothalonil 54.0%F | 0.2-0.4 1-2 fl oz. 1.5-3.0 fl oz 4-5.5 fl oz 5.5 fl oz | 14-28 14-28 14-28 14 pre-disease 14 post-disease |
| bermudagrass ryegrass, St. Augustinegrass tall fescue zoysiagrasses | <i>note:</i> chlorothalonil formulations have new maximum use rates in effect that depends on site - see new labels for details. | | chlorothalonil 38.5% F chlorothalonil 82.5% WDG mancozeb 75DF mancozeb 80WP mancozeb 75DF mancozeb 37% F maneb (37%)+ zinc F mycobutanil 40%WSP myclobutanil 20 EW propiconazole 14.3% pyraclostrobin 20 WDG | 5.8-7.9 fl oz 7.9 fl oz 3.6-5 oz 5 oz 4 oz 4 oz 3-8 oz 6.4 fl oz 1.76 fl oz 0.6 oz 1.2 fl oz 1-2 fl oz 0.5-0.9 oz | 14 pre-disease 14 post-disease 14 pre-disease 14 post-disease 14 pre-disease 14 post-disease 7-14 7-14 3-10 7-14 7-14 14-28 14-28 14-28 14-28 |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|---|--|---|------------------------------------|--|--|
| | | | triadimefon 50WSP | 0.5-1 oz | 15-30 |
| | | | trifloxystrobin 50WDG | 0.1-0.25 oz | 14-21 |
| | | | trifloxystrobin + triadimefon 2.4L | 1-2 fl oz | 14-28 |
| | | | trifloxystrobin + triadimefon 50WP | 0.6-1.2 oz | 14-28 |
| | | | thiophanate methyl 41%F | 4-8 fl oz | 7-14 |
| | | | thiophanate methyl 50WP | 4-8 oz | 7-14 |
| Southern Blight (<i>Sclerotium rolfsii</i>) | Yellow, circular or crescent shaped patches up to 1 ft in diameter, sometimes with “frog-eye” symptoms or less affected grass in the center of patches. Affected turf is a reddish-brown or bronze coloration, turning brown as it dies. Off-white or tan fungi sclerotia may be visible in the mat or thatch with a hand lens. | Avoid drought conditions preceding hot, humid or wet weather; improve poorly drained soils and improve aeration to roots and crowns. | azoxystrobin 50WDG | 0.2-0.4 oz | 14-28 |
| Creeping bentgrass, bluegrasses, fescues, and ryegrasses | | | azoxystrobin 8.8% MEC | 1-2 fl oz. | 14-28 |
| | | | chloroneb 65WP | 4 oz | 5-7 |
| | | | flutolanil 50WP | 2 oz | 21 |
| | | | flutolanil 70WP | 1.5 oz | 21 |
| | | | triadimefon 50WSP | 0.5-2 oz | 14-28 |
| | | | trifloxystrobin + triadimefon 2.4L | 1-2 fl oz | 14 |
| | | | trifloxystrobin + triadimefon 50WP | 0.6-1.2 oz | 14 |
| Spring Dead Spot - (<i>Ophiosphaerella korrae</i> , <i>Ophiosphaerella narmari</i> , or <i>Ophiosphaerella herpotricha</i>) | First appears as circular dead areas 6 inches up to 2 feet in diameter in the spring when the rest of the turf area turns green with new growth. Normally bermudagrass does not invade the dead areas as the growing season progresses nor do the dead areas increase in size until the next spring. <i>note:</i> scout and map diseased spots in spring, treat with fungicides in late summer through early fall. | In established bermudagrass, thorough cultivation of dead areas may provide temporary recovery. Manage thatch by cultural methods, and avoid excess, unbalanced N fertilization in late summer or early fall. | azoxystrobin 50WDG | 0.4 oz | Fall, 1 or 2 applications 1 month prior to dormancy, reapply 14-28 days later. |
| bermudagrass, especially sterile hybrids | | | azoxystrobin 8.8% MEC | 2 fl oz. | Fall, 1 or 2 applications 1 month prior to dormancy, reapply 14-28 days later. |
| | | | fenarimol 11.6%AS | 4-6 fl oz | Up to 3 applications beginning in August. |
| | | | myclobutanil 40%WSP | 0.6-1.2 oz | Fall, 28 days |
| | | | myclobutanil 20 EW | 2.4 fl oz | Fall, 28 days |
| | | | propiconazole 14.3% | 4 fl oz | 1-3 applications, 30 day interval, beginning August, if 3 applications. |
| | | | thiophanate methyl 41%F | 4-8 fl oz | Apply in fall before dormancy/reapply in spring when soil temperatures reach 55-60F. |
| | | | thiophanate methyl 50WP | 4-8 oz | |
| Slime Mold (<i>Physarum</i> sp., and <i>Fuligo</i> sp.) | Bluish-gray encrustations on leaf blades. In spring and summer during heavy rain, prominent white or yellow slimy masses may develop. Slime molds are not parasites of turf. | Brush off or wash off the mold with a strong stream of water. Mow. | mancozeb 80WP | 4-8 oz | 7-14 |
| All grasses | | | mancozeb 75DF | 4-8 oz | 7-14 |
| | | | mancozeb 37%F | 6.4-12.8 fl oz | 7-14 |
| Stripe Smut (<i>Ustilago striiformis</i>) | Tall fescue and Kentucky Bluegrass stands may become clumpy in appearance. Individual leaves appear shredded, with black linear streaks evident in the shredded | General good agronomic practices for culture of the turfgrasses. | fenarimol 11.5% A.S. | 15 fl oz. | Single application in Oct. or early spring. |
| | | | myclobutanil 40WSP | 0.6 oz | 14 |
| | | | myclobutanil 20 EW | 1.2 fl oz. | 14-21 |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|---|--|--|--|--|---|
| | leaves | | propiconazole 14.3% thiophanate methyl 50WSB thiophanate methyl 41%F thiophanate methyl 50WP triadimefon 50WSP trifloxystrobin + triadimefon 2.4L | 1-2 fl oz. 4-8 oz 4-8 fl oz 4-8 oz 1 oz 1 fl oz | Fall or Spring. 7-14 7-14 14-21 Spring, Summer & Fall via label. 3 apps per season/ see label |
| Bermudagrass Decline (<i>Gaeumannomyces graminis</i> var. <i>graminis</i>) Bermudagrass | Disorder first appears as chlorotic patches 8-24" in diameter, usually in late summer during prolonged cloudy weather. Without control, patches will expand. Grass thins and develops bare areas. Green shoots next to chlorotic ones are common. Plants in the affected areas have poor root system, no rhizomes and very few stolons. Usually observed first on outside edge of golf course putting greens. Associated with consistent, low mowing heights. | Raise cutting height to increase photosynthetic area. Do not scalp St. Augustinegrass when mowed. Increased fertility may help by encouraging rapid cover of affected areas. Topdress golf course greens frequently. Alleviate all stresses on the grass. | thiophanate methyl 41%F thiophanate methyl 50WP triadimefon 50WSP | 4-8 fl oz 4-8 oz 1-2 oz | 7-14 in mid-July 7-14 in mid-July 21-28 Irrigate thoroughly after fungicide application to move into the root zone. |
| Take-all Root Rot (same pathogen as above) St. Augustinegrass | | | | | |
| Take-all Patch (<i>Gaeumannomyces graminis</i> var. <i>avenae</i>) creeping bentgrass | Disease appears in spring or summer as patches of discolored turf which may or may not exhibit a "frog-eye" symptom; more common on fairways than greens. In severe cases, nonsusceptible ryegrass or bluegrasses may colonize the center of patches, giving the "frog-eye" symptom. Roots and crowns are rotted and symptoms may become more severe as heat and water stresses become greater. More common on newly constructed sand-based greens, fumigated greens, and/or soils with pH levels > 6.0. | Utilized acidifying fertilizers, such as ammonium sulfate or ammonium chloride, but at rates of N agronomically acceptable for bentgrass growth. Apply Mn at rates recommended by soil tests. Improve root health by aeration and other accepted cultural practices. | azoxystrobin 50%WG azoxystrobin 8.8% MEC fenarimol 11.6%AS myclobutanil 20EW propiconazole 14.3% pyraclostrobin 20WDG thiophanate methyl 41%F thiophanate methyl 50WP triadimefon 50%WSP | 0.4 oz 2 fl oz. 4-8 fl oz 2.4 fl oz 2-4 fl oz 0.9 oz 4-8 fl oz 4-8 oz 1-2 oz | 2 applications, 28 days apart in spring & fall. 2 applications, 28 days apart in spring & fall. 1-2 applications 30 day apart in fall. Fall/spring 28 day Up to 2 applications in spring & fall. 2 applications, 28 days apart in spring & fall When disease symptoms appear, 7-14 day interval. 21-28 Early fall & early spring. |
| Rhizoctonia Leaf and Sheath Spot (<i>R. oryzae</i> , <i>R. zeae</i>) bermudagrass centipedegrass creeping bentgrass | Occurs during summer months when weather is hot and humid. In cool season grasses, symptoms can closely mimic brown patch, caused by <i>R. solani</i> . In bermudagrass, the most commonly observed symptoms are necrotic rings or partial rings that vary from a few inches to a few feet in diameter. Spots may be | Unknown at this time | azoxystrobin 50WDG azoxystrobin 8.8% MEC chlorothalonil 54.0%F chlorothalonil 38.5%F chlorothalonil 82.5% WG | 0.4 2 fl oz. 2-3.6 fl oz 4-5.5 fl oz 2.9-5.1 fl oz 5.8-7.9 1.8-3.2 oz | 14-28 14-28 7-14 pre-disease. 14 post-disease. 7-14 pre-disease. 14 post-disease. 7-14 pre-disease. |

| Disease & Affected Grasses | Symptoms | Cultural Controls | Fungicides ¹ | Formulation Rate, (oz/1000 ft ²) | Application Interval (Days) |
|---|--|--|---|--|--|
| | | | 3.6-5 oz 14 post-disease. | | |
| | | | <p><i>note:</i> chlorothalonil formulations have new maximum use rates in effect that depends on site - see new labels for details. Some other active ingredients may be useful for control but are not specifically labeled for this disease – thiophanate methyl and other fungicides in the benzimidazole class are ineffective.</p> | | |
| Yellow Patch (Cool weather brown patch) (<i>Rhizoctonia cerealis</i>) bentgrass, rough bluegrass, perennial ryegrass, zoysiagrass | Common in cold weather under prolonged cloudy conditions on bentgrass greens or overseeded bermudagrass greens. Yellow to orange irregular rings, with few leafspots in cool season grasses. Also in zoysia in early fall, causing leafspot symptoms in a ring-shaped pattern. | Improve drainage, manage thatch accumulations | azoxystrobin azoxystrobin 8.8% MEC azoxystrobin (5.73%) + propiconazole (9.54%) fludioxonil 50%WP flutolanil 50WP flutolanil 70WP propiconazole 14.3% polyoxin 2.5 WP thiophanate methy 41%F thiophanate methyl 50WP | 0.4 2 fl oz. 3.0 fl oz 0.5 oz 2 oz 1.5 oz 3-4 fl oz 4 oz 4-8 fl oz 4-8 oz | 28 28 28 late fall. 30 days 30 days Apply preventively in fall before growth slows and in spring after growth resumes. |
| Yellow Tuft (downy mildew) (<i>Sclerophthora macrospora</i>) Creeping bentgrass, St. Augustinegrass | In creeping bentgrass, the disease is usually associated with compacted, overly wet areas. In cool season grasses, individual plants will be yellow in color, with excessive proliferation of shoots, giving a “bunchy” appearance. In St. Augustinegrass, linear, gray raised pustules can be seen in the leaves, and leaves will shred longitudinally. | Improve drainage, sunlight penetration; relieve compaction; provide good growing conditions. | fosetyl AI 80WDG mefenoxam 21.3% phosphorous acid salts | 4-8 oz 0.5-1 fl oz 5-10 | 14-21 10-21 7-14 |

Trade Names for Common Turf Fungicides

| Common Name | Trade Name ¹ |
|--------------------------------|---|
| azoxystrobin | Heritage, Heritage TL |
| azoxystrobin + propiconazole | Headway |
| boscalid | Emerald |
| chloroneb | Terraneb SP, Terremec SP |
| chlorothalonil | Daconil formulations, Manicure, Thalonil, Concorde, Echo, others |
| ethazole | Koban, Terrazole |
| fenarimol | Rubigan ² , Patchwork |
| fenarimol + chlorothalonil | Twosome Flowable Fungicide |
| fludioxonil | Medallion |
| flutolanil | Prostar |
| fosetyl Al | Aliette, Aliette Signature, Prodigy |
| iprodione | Chipco 26019, Chipco 26GT Flo |
| maneb | Manex, Maneb + zinc, Dithane M-22 Special, plus others |
| maneb (37%)+ zinc F | Pentathlon F |
| mancozeb | Fore, Dithane T&O, Tersan LSR, Manzate 200 Flowable, Protect T/O, Pentathlon DF, + others |
| mefenoxam | Subdue Maxx |
| metalaxyl | Subdue 2E, Pythium Control, Apron ⁴ |
| metalaxyl + mancozeb | Pace |
| myclobutanil | Eagle, Systhane WSP |
| PCNB | Terraclor, Turfcide, Engage, Penstar, Revere, Defend, PCNB, plus others |
| polyoxin D | Endorse |
| propiconazole ³ | Banner MAXX, Alamo |
| phosphorous acid salts | Alude, Magellan, Biophos, Resyst, Vital |
| propamocarb | Banol |
| pyraclostrobin | Insignia |
| thiophanate methyl | Cleary 3336, Fungo, SysTec 1998, Cavalier, Scotts Systemic Fungicide |
| thiophanate + chloroneb | Scotts Fungicide IV |
| thiophanate + chlorothalonil | ConSyst, Spectro 90 |
| thiophanate + iprodione | Scotts Fluid Fungicide |
| thiophanate + maneb (mancozeb) | Duosan |
| thiophanate + thiram | Bromosan |
| thiram | Spotrete 75, Spotrete-F, Thiramad, plus others |
| triadimefon | Bayleton, Scotts Proturf Fungicide 7, Accost 1G, Granular Turf Fungicide, Strike 25WP |
| triadimefon + metalaxyl | Scotts Fluid Fungicide II |
| triadimefon + thiram | Scotts Fluid Fungicide III |
| trifloxystrobin | Compass |
| trifloxystrobin + triadimefon | Tartan 2.4L, Armada 50WP |
| vinclozolin | Curalan, Vorlan, Touche |

¹Presence of a fungicide in this list does not constitute a recommendation. Trade names are used with the understanding that no endorsement is intended nor is criticism implied of similar products which are not mentioned. All chemicals should be used in accordance with the manufacturer's instructions. Do not add adjuvants, surfactants, etc. to fungicides unless specified by the label. Check labels carefully to determine usage on residential, or commercial turf areas and other restrictions.

²Usage of this product may lead to decline of *Poa annua* in treated turf areas.

³Not for use on bermudagrass greens when temperatures exceed 90°F.

⁴This product is for seed treatment only.

Cross reference table of fungicides for major turfgrass diseases (cont.).

| Fungicide | Turf Diseases | | | | | | | | | | | |
|---------------------------|----------------|------------------|------------|--------------------------------|------|-----------------|------------------|-------------|--------------|----------------|---|----------------------------|
| | Pythium Blight | Pythium Root Rot | Red Thread | Rhizoctonia Leaf & Sheath Spot | Rust | Southern Blight | Spring Dead Spot | Stripe Smut | Summer Patch | Take-all Patch | Yellow Patch (Cool Weather Brown Patch) | Yellow Tuft (Downy Mildew) |
| Aliette, Chipco Signature | ✓ | ✓ | | | | | | | | | | ✓ |
| Banner Maxx | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Banol | ✓ | ✓ | | | | | | | | | | |
| Bavleton | | | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | | |
| Chipco 26019 | | | ✓ | | | | | | | | | |
| Clearv 3336 | | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | |
| Compass | | | ✓ | | ✓ | | | | ✓ | | | |
| Curalan | | | ✓ | | | | | | | | | |
| Daconil | | | ✓ | ✓ | ✓ | | | | | | ✓ | |
| Eagle | | | ✓ | | ✓ | | ✓ | ✓ | | | | |
| Endorse | | | ✓ | | | | | | | | ✓ | |
| Fore | ✓ | | ✓ | | ✓ | | | | | | | |
| Insignia | ✓ | | ✓ | | ✓ | | | | ✓ | ✓ | | |
| Heritage | ✓ | ✓ | ✓ | | | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Koban/Terrazole | ✓ | ✓ | | | | | | | | | | |
| Medallion | | | | | | | | | ✓ | | ✓ | |
| PCNB | | | | | | | | | | | | |
| Phosphorous acids | ✓ | ✓ | | | | | | | | | | ✓ |
| Prostar | | | ✓ | | | ✓ | | | | | ✓ | |
| Rubigan | | | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | |
| Sentinel | | | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | |
| Spotrete | | | | | | | | | | | | |
| Subdue Maxx | ✓ | | | | | | | | | | | ✓ |
| Terraneb | ✓ | ✓ | | | | ✓ | | | | | | |

Turfgrass fungicides classified by chemical fungicide group.

| Chemical Group (activity) | Common Name | Trade Name Examples |
|--|---------------------------|--|
| Anilide (Upward Mobile; Curative and Protective) | boscalid | Emerald |
| Acetanilide (Upward Mobile; Curative and Protective) | Metalaxyl | Subdue, Apron (seed treatment only) |
| | Mefanoxam | Subdue Maxx |
| Aromatic Hydrocarbons (Contact; Protective) | Chloroneb | Terraneb, Teremec |
| | Ethazole (Etridiazole) | Koban, Terrazole |
| | PCNB (Quintozene) | Terraclor, PCNB, Engage, Revere, Penstar, Turfcide |
| Benzamide (Upward Mobile; Curative and Protective) | Flutolanil | ProStar |
| Benzimidazoles (Upward Mobile; Curative and Protective) | Thiophanate Methyl | Fungo 50, Fungo Flo, Cleary 3336 |
| Benzonitrile (Contact; Protective) | Chlorothalonil | Daconil Ultrex |
| Carbamates (Upward Mobile; Curative and Protective) | Propamocarb Hydrochloride | Banol |
| Demethylation Inhibitors (DMI) (Upward Mobile; Curative and Protective) | Fenarimol | Rubigan |
| | Myclobutanil | Eagle WSP |
| | Propiconazole | Banner |
| | Triadimefon | Bayleton, Scotts Proturf Fungicide 7 |
| Dicarboximides (Local-penetrant; Protective) | Iprodione | Chipco 26019 |
| | Vinclozolin | Vorlan, Curalan, Touche |
| Dithiocarbamates (Contact; Protective) | Mancozeb | Fore, Tersan LSR, Dithane M-45, Manzate 200FL, Protect |
| | Maneb | Manex, security Maneb Spray, Dithane -22 Special |
| | Thiram | Spotrete 75, Spotrete-F, Thiramed |
| Phosphonates (Systemic; Curative and Protective) | Fosetyl-Al | Aliette, Chipco Signature, Prodigy |
| | phosphorous acid salts | Alude, Magellan, Biophos, Resyst, Vital |
| Strobilurines (methoxyacrylates) (Upward mobile, Curative and Protective-azoxystrobin) (local penetrant or mesostemic, curative and protective – trifloxystrobin) | Azoxystrobin | Heritage |
| | Trifloxystrobin | Compass |
| | Pyraclostrobin | Insignia |