

MARYLAND TURFGRASS DISEASE CONTROL RECOMMENDATIONS



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Dr. Peter Dernoeden, Turfgrass Specialist

University of Maryland Department of Plant Sciences & Landscape Architecture

Diseases can seriously damage turfgrass plants and the appearance of turf. Promoting vigorous growth through sound cultural practices greatly aids in minimizing disease injury. Frequently, however, environmental stress, traffic, or poor management weakens plants and predisposes them to invasion by fungal pathogens.



Pythium blight of tall fescue in early summer

When disease symptoms appear, the turfgrass manager must make a rapid and accurate diagnosis of the disorder. The prudent manager also attempts to determine the cultural factors that may have contributed to the disease.

The most common cultural abuses that aggravate turf diseases include close and frequent mowing, poor drainage, excessive thatch, light and frequent irrigation, inadequate or excessive nitrogen fertility, shade and traffic. An example is summer patch, which is particularly damaging when turf is mown too closely, given light and frequent irrigations, and fertilized with excessive amounts of nitrogen.

Despite hard work and good management, disease frequently becomes a serious problem. This normally occurs when environmental conditions favor disease development instead of plant growth. For example, snow molds, Pythium blight, and brown patch are damaging when unfavorable temperatures stress plants, impairing their growth and recuperative capacity. In these situations, fungicides are generally recommended in conjunction with cultural practices that promote turf vigor.

Fungicides may be applied prior to disease outbreak in a preventive program or after disease symptoms appear as a curative treatment. Because of increasing costs of pesticides and application, it is an economic necessity that fungicides be chosen wisely. In selecting a fungicide consider its effectiveness, spectrum of activity, shelf-life, ease of application, availability, cost, and safety to the user, environment and plants. Ultimately, use of disease resistant cultivars and sound cultural practices will provide the most efficient means of discouraging disease. See TT-77 for current Maryland turfgrass cultivar recommendations.

The fungicides that are recommended for turfgrass disease control are listed on the following pages. Fungicides should be applied in one to two gallons of water per 1000ft². Consult the label for more information on spray frequency, tank-mixing and other important facts. See TT-32 for Diagnosis of Common Lawn and Athletic Field Diseases.

References to trade or brand names does not constitute an endorsement, guarantee or warranty by the Univ. of Maryland. No discrimination is intended against products not mentioned.

KEY POINTS

Accurate disease diagnosis is essential for effective control: Refer to TT-32 for assistance.

Fungicides are costly and may provide only 10 to 21 of days control.

Inappropriate cultural practices often contribute to disease development.

Fungicide application rates that are appropriate for preventive control may not stop active disease.

Before any pesticide application, be sure to consult the product label for directions regarding spray frequency, tank mixes and other important facts.

Disease, Turfgrass Host and Season	Fungicide	Rate of Formulated Material/1000ft ²	Schedule and Comments
Algae All turfgrasses, especially putting greens May to October	^x Chlorothalonil (Daconil, others)	3-6 oz.	Apply preventively on 10-14 day intervals. Alleviate compaction and poor surface drainage. Increase mowing height and ensure proper N-P-K nutrition. Junction may discolor turf; apply in 5.0 gal. water/1000ft ² ; do not use in sprayers with aluminum parts.
	Fore, Dithane Junction	6-8 oz. 2-6 oz.	
Anthracnose <i>Colletotrichum cereale</i> Annual bluegrass and bentgrass March to October	^y *Banner MAXX	1-2 oz.	Apply as needed on 7 to 14 day intervals. Alleviate compaction and use modest levels of N-fertilizer in summer. On greens, avoid abrasive cultural practices and spoon feed by syringing 0.10 lb N per 1000ft ² weekly when disease is active. Increase mowing height and reduce mowing frequency. [*] Apply preventively on 14 to 21 day intervals and tank-mix with chlorothalonil or Medallion for best results, especially for curative activity.
	*Bayleton 50W	1-2 oz.	
	^a CL3336	6-8 oz.	
	Compass	0.15-0.25 oz.	
	^x Chlorothalonil (Daconil, others)	3-6 oz.	
	Endorse	4.0 oz.	
	Heritage	0.2- 0.4 oz.	
	Insignia	0.5-0.9 oz.	
Bacterial Wilt <i>Xanthomonas</i> spp. Annual bluegrass May to October	^x Chlorothalonil (Daconil, others)	0.25-0.50 oz.	Copper-based products are contact protectants that may slow spread of the bacteria. These products do not control the disease in infected plants. Apply on a 5-7 day interval. Disease can rapidly redevelop after rain. Increase mowing height and avoid abrasive cultural practices.
	*Rubigan AS	0.75-3.5 fl. oz.	
	*Signature	4-6 oz.	
	*Triton	1-2 oz.	
Bentgrass Dead Spot <i>Ophiosphaerella agrostis</i> Bentgrass June to October	COCS	0.5-1.0 oz.	Apply as needed on a 7-14 day interval and tank-mix with 0.10 lb N/1000ft to promote recovery.
	Junction	1.0-2.0 oz.	
	Kocide	1.0-2.0 oz.	
	Banner MAXX	1-2 oz.	
Brown Patch <i>Rhizoctonia solani</i> All turfgrasses, Particularly ryegrasses, bentgrasses, and tall fescue June to September	^z Chipco 26GT	4-6 oz.	Apply during hot humid weather especially when night temperatures exceed 68°F, and avoid excessive N and night irrigation. [*] Banner MAXX and Bayleton are more effective when tank-mixed with either chlorothalonil, Chipco 26GT, Fore or Medallion. [‡] Compass, Endorse, Heritage, Insignia and ProStar can provide 21 days or longer control.
	CL 3336	4-6 oz.	
	[‡] Compass	0.15-0.25 oz.	
	Curalan, Touche	4-6 oz.	
	^x Chlorothalonil (Daconil, others)	3-6 oz.	
	[‡] Endorse	4.0 oz.	
	Fore, Dithane	6-8 oz.	
	Eagle	0.6-1.2 oz.	
[‡] Heritage	0.2-0.4 oz.		
Copper Spot <i>Gloeocercospora sorghi</i> Bentgrasses; particularly velvet bentgrass July to September	Bayleton 50W	1-2 oz.	Apply as needed. Copper spot rarely occurs in Maryland.
	CL 3336, T-Storm	4-6 oz.	
	^x Chlorothalonil (Daconil, others) Rubigan	3-6 oz. 0.7-1.5 oz.	

^x Chlorothalonil is sold under the following trade names: Daconil Ultrex, Daconil Weatherstik, Concorde, Echo, and Manicare. There are several formulations and rates vary. See the label for more specific rate information.

^y Propiconazole is sold under the following trade names: Banner MAXX, Propiconazole Pro, and Spectator. There are two formulations and rates vary. See the label for more specific rate information.

^z Iprodione is sold under the trade names of Chipco 26GT and Iprodione Pro.

^a Thiophanate methyl is sold under the trade name of Cleary 3336, T-Storm, and T-Methyl Pro.

Disease, Turfgrass Host and Season	Fungicide	Rate of Formulated Material/1000ft ²	Schedule and Comments
Dollar Spot	^y Banner MAXX	1-2 oz.	Maintain adequate N levels, increase mowing height, and maintain good soil moisture during dry periods in late summer.
<i>Sclerotinia homoeocarpa</i>	Bayleton 50W	0.5-1.0 oz.	
All turfgrasses	^z Chipco 26GT	2-4 oz.	Alternate fungicides with different modes of action to avoid development of resistant strains. Avoid Heritage and ProStar when dollar spot is active.
	CL 3336	2-4 oz.	
May to November	Curalan, Touche	2-4 oz.	
	^x Chlorothalonil	3-6 oz.	
	(Daconil, others)		
	Emerald	0.13-0.18 oz.	
	Eagle	0.6-1.2 oz.	
	Rubigan AS	0.75-1.5 fl. oz.	
	Triton	1-2 oz.	
Fairy Rings	Bayleton	2-4 oz.	Frequent aeration, water injection into dry "fairy ring" soil with a tree root feeder or water fork, wetting agents and maintaining adequate N fertility alleviates symptoms.
	Heritage	0.4 oz.	
<i>Marasmius oreades</i> , <i>Agaricus</i> spp., <i>Lycoperdon</i> spp., and others	ProStar	2.2-4.5 oz.	Drench ProStar or Heritage on a 4 week interval or Endorse twice on a 7 day interval after aeration. Tank-mixing Bayleton with ProStar may improve performance. Tank-mix fungicide with a soil wetting agent to improve penetration. Aerify or spike prior to drenching-in fungicide + wetting agent.
All turfgrasses	Endorse	4.0 oz.	
All year			

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Gray Leaf Spot	^x Chlorothalonil (Daconil, Others)	3-6 oz.	Apply as needed on a 10-14 day interval beginning mid-July. [†] Banner MAXX and Bayleton alone are weak, but tank-mixes with chlorothalonil or Fore may provide up to 21 days control during low to moderate disease pressure periods. Collect clippings and mow when turf is dry. Avoid using Compass, Heritage, and Insignia more than twice annually.
<i>Pyricularia grisea</i>	CL3336	6-8 oz	
Perennial ryegrass	Compass	0.15-0.25oz.	
	Endorse	4.0 oz.	
Mid July to early November	Fore, Dithane	6 oz.	
	Heritage	0.2-0.4 oz.	
	Insignia	0.5-0.9 oz.	
	^{Y, †} Banner MAXX + Chlorothalonil	1.0 + 3.2 oz.	
	[†] Bayleton 50W+ Chlorothalonil	0.5-0.3.2 oz.	

Leaf Spot, Melting-Out, and Net-blotch	^z Chipco 26GT	2-4 oz.	Apply as needed on 14-21 day intervals. Avoid drought stress, light and frequent watering, excessive thatch, applications of broadleaf herbicides and high N fertility in spring. Overseed with improved cultivars.
<i>Drechslera</i> spp., <i>Bipolaris</i> spp. (Formerly <i>Helminthosporium</i> spp.)	Compass	0.15-0.25 oz.	
	Curalan, Touche	2-4 oz.	
All turfgrasses April to November	^x Chlorothalonil (Daconil, others)	3-6 oz.	
	Fore, Dithane	4-6 oz.	
	Medallion	0.25 oz.	
	Terraclor 75	4-6 oz.	

Microdochium Patch	^Y □ Banner MAXX	2-4 oz.	Symptoms appear during cool, wet weather in the presence or absence of snow cover. Where chronic, apply just prior to cold and wet weather. Disease can be most damaging in April and May. [†] See label restrictions. □ Tank-mix with chlorothalonil or Chipco 26GT for best results. [‡] Tank-mix with Terraclor or Chipco 26GT. ^{**} Tank-mix with Banner MAXX. [*] Rates shown may discolor greens, <i>see label</i> .
<i>Microdochium nivale</i> (a.k.a. Pink Snow Mold and Fusarium Patch)	□ Bayleton 50W	1-2 oz..	
	^{z†} □ Chipco 26GT	4-8 oz.	
All turfgrasses, esp. bentgrass and annual bluegrass	[‡] □ Chlorothalonil (Daconil, Others)	3-6 oz.	
	[‡] Heritage	0.4-0.7 oz.	
	[‡] Insignia	0.9 oz.	
November to May	[‡] Compass	0.25 oz.	
	CL3336	2-4 oz.	
	□** Medallion	0.5 oz.	
	□** Terraclor 75 WP	6-8 oz.	

Moss	Junction	2-6 oz.	Use of fatty acid soaps and Junction reduce moss invasion, but they may discolor; apply Junction in 5.0 gal. water/1000ft ² . Physically remove by verticutting; increase mowing height; and increase N fertility in fall [ammonium sulfate (3.0 lb N/M ² /yr)].
All turfgrasses, especially putting greens	Fatty acid soaps	See label	
All year, especially summer	TerraCyte	See label	
	Quicksilver	See label	

Disease, Turfgrass Host and Season	Fungicide	Rate of Formulated Material/1000ft ²	Schedule and Comments
Necrotic Ring Spot	Banner MAXX	4.0 oz.	Apply fungicide in April and May, and water-in prior to drying on leaves. The symptoms of this disease mimic summer patch. Necrotic ring spot is uncommon in Maryland, but can be severe in some cultivars.
<i>Ophiosphaerella korrae</i>	Eagle	1.2 oz.	
	CL 3336	4.0 oz.	
Kentucky bluegrass and creeping red fescue	Heritage	0.2-0.4 oz	
	Rubigan AS	4.0-6.0 fl. oz.	
All year, especially April to November			
Nematodes	Nemacur	See label	See label.

All turfgrasses, especially bentgrass, bluegrasses, and zoysiagrass

Summer

Nemacur is for commercial use only, and cannot be applied to home lawns, and must be applied by a certified applicator. Increase mowing height and irrigate deeply but infrequently.

Powdery Mildew <i>Blumeria graminis</i> (Formerly <i>Erysiphe graminis</i>) Bluegrasses and fine fescues in shaded sites April to November	^y Banner MAXX Bayleton 50W Eagle	1-2 oz. 1.0 oz. 1.2 oz.	Apply as needed. Reduce shade and improve air movement. Avoid excessive N fertility, drought stress, and increase mowing height.
Pythium Blight <i>Pythium</i> spp. All turfgrasses, particularly ryegrass, bentgrass, annual bluegrass, and fescues. Spring or summer seeded stands are especially vulnerable. June to September	Alude (other K phosphites) *Banol [†] Koban *Signature *Subdue MAXX [†] Terramec SP	5-10 oz. 1.5-4 oz. 4-6 oz. 4-6 oz. 0.5-1.0 oz. 4-6 oz.	[†] Koban and SP are best for curative treatment. Water early in the day, and improve drainage and air circulation. Avoid excessive N fertility. Most of these materials can discolor greens when applied during hot weather. [*] Tank-mixing with Fore/Dithane WP (4.0-6.0 oz/1000ft ²) is suggested. Signature, Banol and Subdue provide 14-21 days of control or longer when applied in 3.5 gal/water/1000ft ² . Signature and Banol should be applied preventively for best results.
Pythium Root Diseases <i>Pythium</i> spp. Annual bluegrass and bentgrass Spring and autumn during excessively wet periods	[†] Banol [†] Koban **Insignia *Signature [†] Subdue MAXX [†] Terramec SP	1.5-4 oz. 4-6 oz. 0.9 oz. 4-6 oz. 0.5-1.0 oz. 4-6 oz.	Apply as needed on 14- 21 day intervals. Improve drainage and increase mowing height. [†] Water-in to a 0.5-1.0 inch soil depth. [†] Tank mix with Fore WP (4-6 oz/1000ft ²) and do not water-in. Fore flowable is not compatible with Signature. ** Insignia drenches were shown to be effective on patch-type root Pythium.
Red Thread / Pink Patch <i>Laetisaria fuciformis</i> and Pink Patch (<i>Limonomyces</i> spp.) All turfgrasses, particularly ryegrasses and creeping red fescue All year during wet, overcast periods (especially April to June)	^y Banner MAXX Bayleton 50W Curalan, Touche ^z Chipco 26GT Compass ^x Chlorothalonil (Daconil, others) Endorse Heritage Insignia ProStar	2 oz. 0.5- 1.0 oz. 2-4 oz. 4 oz. 0.10-0.25 oz. 3-6 oz. 4.0 oz. 0.2-0.4 oz. 0.5-0.9 oz. 2.2 oz.	Apply as needed on 14-21 day intervals. Maintain adequate N fertility levels. Apply 1.0 lb N/1000ft ² in the spring when the disease is evident.

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Disease, Turfgrass Host and Season	Fungicide	Rate of Formulated Material/1000ft ²	Schedule and Comments
Rust <i>Puccinia graminis</i> and other <i>Puccinia</i> spp. Bluegrasses (especially Merion), ryegrass and zoysiagrass	^y Banner MAXX *Bayleton 50W ^{x,†} Chlorothalonil (Daconil, others) Fore, Dithane *Heritage *Insignia	2 oz. 0.5 -1.0 oz. 3-6 oz. 4.0-6.0 oz. 0.2-0.4 oz. 0.5-0.9 oz.	Apply [†] contact fungicides on a 7-10 day interval as needed or apply a *penetrant fungicide once when symptoms appear. Improve turf vigor by maintaining adequate N levels.
July to October			
Spring Dead Spot <i>Ophiosphaerella korrae</i> Bermudagrass, esp. Tufcote	^y Banner MAXX Eagle Heritage *Rubigan AS	4.0 fl. oz. 2.4 oz. 0.4 oz. 4.0-6.0 fl. oz.	Apply a fungicide once in mid-Sept. or about 30 days prior to expected bermudagrass dormancy. Expect only 30-60% reduction in disease. Spring and summer applications of ammonium sulfate + KCl help to reduce disease severity over time. Avoid applying N after mid-August. Avoid nitrate forms of N. *Rubigan applied at 4.0 fl. oz. per 1000ft ² , three times on a 14 day interval ending prior to bermudagrass dormancy also provides preemergence <i>Poa annua</i> control.
Stripe Smut <i>Ustilago striiformis</i> and Flag Smut <i>Urocystis agropyri</i> Bluegrasses (particularly Merion), ryegrasses, and tall fescue Primarily spring and fall	^y Banner MAXX Bayleton 50W Eagle	1-2 oz. 1-2 oz. 1.2 oz.	A single application in May or during mid to late October provides good control. Avoid drought stress and control excessive thatch.
Slime Molds <i>Physarum cinereum</i> and others All turfgrasses Moist periods, moderate temperature of spring, summer and fall	No fungicide necessary		Remove fruiting structures from turfgrass leaves by mowing, poling, dragging, or hosing with water.
Southern Blight <i>Sclerotium rolfsii</i> Bluegrass and bentgrass Summer	Heritage ProStar	0.4 oz. 2.2-4.0 oz.	Apply or spot apply fungicide as needed. This disease rarely occurs in Maryland.
Summer Patch <i>Magnaporthe poae</i> Kentucky bluegrass, annual bluegrass, and fine leaf fescue July to September	^y Banner MAXX Bayleton 50W [†] Compass CL 3336 Eagle Heritage [†] Insignia	2-4 oz. 1-2 oz. 0.25 oz. 4-8 oz. 1.2-2.4 oz. 0.2-0.4 oz. 0.9 oz.	Apply in early June and early July to lawns. For greens, begin treatment in mid-May and apply on 28 day intervals. Increase mowing height, and irrigate deeply at onset of drought. Avoid excessive thatch, compaction, high N fertility in spring, and nitrate forms of N. Use slow release and acidifying N fertilizers such as sulfur coated urea. Water-in fungicide ([†] except Compass and Insignia) before it dries on leaves may improve effectiveness. *Rubigan may injure and thin annual bluegrass at the rates shown.

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Disease, Turfgrass Host and Season	Fungicide	Rate of Formulated Material/1000ft ²	Schedule and Comments
Take-all Patch <i>Gaeumannomyces graminis</i> var. <i>avenae</i> Bentgrasses Infection periods spring and fall; damage may not appear until late spring or summer	Bayleton ^y Banner MAXX Rubigan AS Heritage Insignia	2.0-4.0 oz. 2.0-4.0 oz. 4.0 oz. 0.4 oz. 0.9 oz.	Disease injury is best alleviated by acidifying soil with ammonium sulfate (A.S.) or ammonium chloride (A.C.). Substitute A.S. or A.C. for other water soluble N fertilizers, and apply 3-4 lbs N/1000ft ² annually, with one application during April. Maintain soil pH = 5.5, and avoid use of limestone unless pH falls below 5.2. Apply potassium (2-4 lbs/1000ft ²) from KCl and phosphorus (1-2 lbs/1000ft ²) annually. Apply MnSO ₄ (Mn at 1-2 lb/acre) monthly, except winter. Fungicides applied 2 to 4 times curatively or preventively in Oct., Nov., Apr., and May will alleviate disease injury. Rubigan may injure annual bluegrass.
Typhula Blight or Gray Snow Mold <i>Typhula incarnata</i> <i>Typhula ishikariensis</i> All turfgrasses December to April	^y †Banner MAXX ‡Bayleton 50W ‡Compass ^z ‡Chipco 26GT ^x ‡Chlorothalonil (Daconil, others) ‡Heritage ‡Insignia **Medallion ‡ProStar *Terraclor 75 WP Terramec SP	2-4 oz. 1-2 oz. 0.25 oz. 4-8 oz. 3-6 oz. 0.4 oz. 0.9 oz. 0.5 oz. 3.0-4.5 oz. 6-8 oz. 6-9 oz.	Apply before the first heavy snow or onset of cold, rainy weather. Generally, only one early winter application is sufficient in Maryland. †See label restrictions. ‡Tank-mix with Chlorothalonil, Chipco 26GT or Terraclor for best results. *Rates shown may discolor, <i>see label</i> . **Tank-mix with Banner MAXX or Chlorothalonil.
Yellow Patch or Cool Temperature Brown Patch <i>Rhizoctonia cerealis</i> Bentgrass, annual bluegrass and perennial ryegrass November to May	^z □ Chipco 26GT ^x □ Chlorothalonil (Daconil, others) Endorse Heritage Medallion ‡ProStar †Terraclor 75WP	4-6 oz. 3-6 oz. 4-0 oz. 0.2-0.4 oz. 0.5 oz. 3.0-4.5 oz. 4-6 oz.	Apply as needed on a 14 day interval. ‡ ProStar has both preventive and curative activity. † Terraclor may yellow turf. □ Tank-mix with chlorothalonil or Chipco 26GT for best results.
Yellow Tuft <i>Sclerophthora macrospora</i> All turfgrasses All year, especially late fall to spring	*Subdue MAXX	0.5-1.0 oz.	Make one or two annual applications preventively in spring or fall. Apply three times on a two week interval for curative control; curative control can be erratic. Improve drainage. Tank-mix with chlorothalonil for best results.

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