

# Turfgrass

## Key for the Identification of Some Southern Turfgrass Diseases

(prepared by G.E. Holcomb)

I. Grass affected in distinct patches; yellow to brown in color.	
A. Patches about 3 inches in diameter; leaf lesions present .....	<b>Dollar Spot</b>
B. Patches greater than 3 inches in diameter; no leaf lesions present.	
1. Ring or arc of lush growth or dead grass; mushrooms present or not .....	<b>Fairy Ring</b>
2. No ring or arc of lush growth present; no mushrooms present.	
a. Grass often affected in streaks with leaves matted; primarily on ryegrass overseeded on golf courses and bermudagrass greens .....	<b>Pythium Blight</b>
b. Patches more or less circular, may enlarge to several feet; leaves rotted at the base, can be pulled easily from the leaf sheath .....	<b>Brown (Large) Patch</b>
c. Affected areas irregular in shape, 8-24 inches in diameter (or larger) with a mixture of yellow and dead grass; roots are sparse, short and black; stolons may be rotted .....	<b>Take-all Root Rot</b>
II. Grass not affected in patches.	
A. Chlorotic spots and orange powder (spores that can be rubbed off) on leaves .....	
B. Leaf spots present, but no orange powder present.	
1. Leaf spots varying in size; occurring primarily on bermudagrass and ryegrass .....	<b>Melting Out or Leaf Spot</b>
2. Leaf spots oval to irregular in shape with brown borders and tan to gray centers; primarily on St. Augustinegrass .....	<b>Gray Leaf Spot</b>
3. Leaf spots reddish brown to brown surrounded by a yellow halo; primarily on centipedegrass .....	<b>Anthracnose</b>
C. No leaf spots present.	
1. Grass covered with an easily removed slimy or crusty growth .....	<b>Slime Mold (not a disease)</b>
2. Mottle, chlorosis or mosaic on leaves; on St. Augustinegrass or centipedegrass .....	<b>St. Augustine Decline or Centipede Mosaic (virus diseases caused by Panicum Mosaic Virus)</b>

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## Fungicide Uses on Commercial Turfgrasses

Fungicide Common Name <sup>a</sup>	Brown patch	Large patch	Dollar spot	Gray leaf spot	Leaf spots / melting out	Take-all root rot <sup>b</sup>	Fairy ring	Pythium blight	Algae
aluminum tris (fosetyl-al)								X	
azoxystrobin	X	X		X	X	X	X	X	
boscalid			X						
captan	X				X				
chloroneb	X							X	
chlorothalonil	X		X	X	X				X
cyazofamid								X	
ethazole (etridiazole)								X	
fenarimol	X		X			X			
fludioxonil	X			X	X				
fluoxastrobin	X			X	X	X		X	
flutolanil	X	X					X		
iprodione	X	X	X		X				
mancozeb	X		X	X	X			X	X
mefenoxam								X	
metalaxyl								X	
metconazole	X	X	X				X		
myclobutanil	X	X	X		X	X			
pentachloronitrobenzene (PCNB)	X		X		X				
polyoxin D	X	X		X	X		X <sup>c</sup>		
phosphites (various salts)								X	
propamocarb hydrochloride								X	
propiconazole	X	X	X	X	X	X			
pyraclostrobin	X		X <sup>c</sup>	X	X	X	X	X	
thiophanate-methyl	X	X	X	X	X	X			
thiram	X		X						
triadimefon	X <sup>c</sup>	X	X	X		X			
trifloxystrobin	X		X	X	X				
triticonazole	X	X	X			X			X
vinclozolin	X		X		X				
<b>COMBINATION PRODUCTS</b>									
azoxystrobin + propiconazole	X	X	X	X	X		X	X	

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Fungicide Common Name <sup>a</sup>	Brown patch	Large patch	Dollar spot	Gray leaf spot	Leaf spots / melting out	Take-all root rot <sup>b</sup>	Fairy ring	Pythium blight	Algae
chlorothalonil + fenarimol		X	X	X	X				
chlorothalonil + propiconazole + fludioxonil	X		X	X	X				
chlorothalonil + thiophanate-methyl	X		X	X	X				
mancozeb + copper hydroxide	X		X		X			X	X
thiophanate-methyl + flutolanil		X	X	X	X		X		
trifloxystrobin + triadimefon	X		X	X	X				

<sup>a</sup> Active ingredient.

<sup>b</sup> Also, Ggg root decline, Bermuda decline & spring dead spot.

<sup>c</sup> For disease suppression only.

### Relative Efficacy of Various Fungicides Against Diseases of Turfgrass<sup>a</sup>

Fungicide Common Name <sup>b</sup>	Brown patch	Large patch	Dollar spot	Gray leaf spot	Leaf spots / melting out	Take-all root rot <sup>c,d</sup>	Fairy ring	Pythium blight	Algae
aluminum tris (fosetyl-al)								2+	
azoxystrobin	3	4		4	3+	(3+)	3	2	
boscalid			4						
chlorothalonil	3		3	2+	2+				3+
cyazofamid								3	
ethazole (etridiazole)								1	
fenarimol	2		3			(2+)			
fludioxonil	3+				3+				
fluoxastrobin	3+							2+	
flutolanil	3+	4					3		
iprodione	3	2	3+		4				
mancozeb	3		1	2	3+			2	3

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Fungicide Common Name <sup>b</sup>	Brown patch	Large patch	Dollar spot	Gray leaf spot	Leaf spots / melting out	Take-all root rot <sup>c,d</sup>	Fairy ring	Pythium blight	Algae
mefenoxam								2+	
metalaxyl								2+	
metconazole	3		3+	2			3		
myclobutanil	2+	2+	4		1				
pentachloronitrobenzene (PCNB)	2	4			2				
polyoxin D	3+	1		1			2+		
phosphites (various salts)								2	
propamocarb hydrochloride								2+	
propiconazole	3	2	4	2	2	(2+)			
pyraclostrobin	4	2+	<sup>2</sup>	4	3	(3)	3	2+	
thiophanate-methyl	2+		4	4	2				
thiram	2		1						
triadimefon	2	4	4	2		(2+)	3		
trifloxystrobin	4			3+	2+				
triticonazole	3	3	3+						2
vinclozolin	1.5		4		3.5				

<sup>a</sup> Efficacy ratings are on a scale from 1 (inconsistent but performs well in some instances) to 4 (consistently good to excellent results) and are based on trials using commercial formulations of the fungicides, not the formulations readily available to homeowners. Ratings were compiled by Dr. Paul Vincelli and Dr. David Williams at the University of Kentucky from published reports over the past 33 years. Source: PPA-1 Chemical Control of Turfgrass Diseases 2010; [http://www.turf.uconn.edu/pdf/research/factsheets/Fungicides-UK\\_2010.pdf](http://www.turf.uconn.edu/pdf/research/factsheets/Fungicides-UK_2010.pdf).

<sup>b</sup> Active ingredient.

<sup>c</sup> Also, Ggg root decline, Bermuda decline & spring dead spot.

<sup>d</sup> Ratings within parentheses are for take-all patch caused by *Gaeumannomyces graminis* var. *avenae*.

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## Fungicides for Use on Commercial Turfgrass

Common Name	Trade Name (example)	Formulation(s)	Rate(s) (/1,000 sq ft)	Comments	FRAC Code
aluminum tris (fosetyl AI)	Chipco Signature Prodigy Signature	80% WDG	4-8 oz	<b>Not for use on home lawns!</b> 14- to 21-day interval	33
azoxystrobin	Heritage Ortho Disease Control Pro	50% WG 8.8% L	0.2-0.4 oz 1-2 fl oz	14- to 28-day interval; no more than 3.7 oz or 18.5 fl oz/1000 sq ft/year	11
boscalid	Emerald	70% WG	0.13-0.18 oz	<b>For golf course use only.</b> 14- to 28-day interval; no more than 1.1 oz/1000 sq ft/year	7
captan	Captan Pro	50% WP 80% WDG	0.125-0.2 lb 0.125 lb	<b>For use on golf courses and sod farms only.</b> 7- to 14-day interval	M4
chloroneb	Teremec	65% SP	4 or 5 oz	See label.	14
chlorothalonil	Applause, Chlorostar, Chlorothalonil, Countdown, Daconil, Echo, Ensign, Equus, Initiate, Mainsail, Manicure	38.5% F 54% F 82.5 WDG	1.5-8.3 fl oz 1-5.5 fl oz 1-5 oz (see label)	<b>Not for use on home lawns!</b>	M5
cyazofamid	Segway	34.5% F	0.45-0.9 fl oz	No more than 3 applications or 2.7 fl oz/1000 sq ft/yr	21
etridiazole (ethazole)	Terrazole	35% WP	2-4 oz	<b>For use on golf course tees and greens only.</b> 10- to 14-day interval; no more than 10 oz/1000 sq ft/year	14
fenarimol	Rubigan	11.6% L	0.75-8 fl oz (see label)	No more than 32 fl oz/1000 sq ft/year	3
fludioxonil	Medallion	50% WP	0.25-0.5 oz (see label)	No more than 1.5 oz/1000 sq ft/year	12
fluoxastrobin	Disarm G	480 SC	0.09-0.36 fl oz (see label)	14- to 28-day interval; no more than 0.4 fl oz/1000 sq ft/year	11
flutolanil	Prostar	70% WP	1.5-4.5 oz (see label)	No more than 4.5 oz/1000 sq ft/year	7
iprodione	26GT Chipco 26019 Iprodione Pro	23.3% F 50% WP	3-8 fl oz 1.5-4 oz	<b>Not for use on residential lawns!</b> no more than 35 fl oz or 17.6 oz/1000 sq ft/year	2
mancozeb	Dithane, Fore, Manzate, Penncozeb, Pentathlon, Protect	37% F 75% DF 80% WP	6.4-12.8 fl oz 4-8 oz 4-8 oz	See label	M3
mefenoxam	Fenox Mefenoxam Subdue Ultra Flourish	1% G 21.3% L 22.5% F 25.1% 45% WP	12.5-25 oz 0.5-1 fl oz 0.2-1 fl oz 0.5-1 fl oz 0.28-0.56 oz	No more than three applications of mefenoxam per season	4
metconazole	Tourney	50% WDG	0.18-0.44 oz	<b>Do not use on bermudagrass!</b> No more than 4 lb/A/yr	3

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Common Name	Trade Name (example)	Formulation(s)	Rate(s) (/1,000 sq ft)	Comments	FRAC Code
myclobutanil	Eagle Hoist	20EW 40% WP	1-2.4 fl oz 0.6-1.2 oz	No more than 13.8 fl oz or 7.2 oz/1000 sq ft/year	3
pentachloro-nitrobenzene (PCNB)	Glacier, Parflo, PCNB, Revere, Terraclor, Turfcide	10% G 38.3% F 75% WP	5-7.5 lb 11-24 fl oz 7-16 oz	See label	14
phosphite (salts of phosphorous acid)	Alude, Exel, Fosphite, Fungi-phite, Helena Prophyt, Primera Magellan, Vital	Phosphorous acid equivalent (lb/gal) 3.35 3.9 4.2 4.32	5-10 fl oz 2-3 fl oz 4-6 fl oz 4.1-8.2 fl oz	Helena Prophyt for sod farms only; see label	33
polyoxin D	Endorse	2.5% WP	see label		19
propamocarb hydrochloride	Banol	66.5% L	1.33-4 fl oz (see label)	No more than 12.5 fl oz/1000 sq ft/year	28
propiconazole	Banner, Dorado, Fathom, Headway, Honor Guard, Propensity, Propiconazole, Savvi, Spectator	14.3% L 41.8% L	0.5-4 fl oz 0.18-1.44 fl oz (see label)	No more than 16 or 5.8 fl oz/1000 sq ft/year	3
pyraclostrobin	Insignia	20% WG	0.5-0.9 oz	No more than 5.5 oz/1000 sq ft/year	11
thiophanate-methyl	3336, Allban, Cavalier, Quali-Pro TM, T-Methyl, Transom, T-Storm	2% G 41.25% L 46.2% F 50% WP	1.5-9 lb 2-6 fl oz 1-5 fl oz 2-6 oz (see label)	See label	1
thiram	Defiant, Spotrete, Thiram	42.1% L 75% WDG	3.75-7.5 fl oz 2.5-5 oz	See label	M3
triadimefon	Bayleton	50% WP	0.25-2 oz	See label	3
trifloxystrobin	Compass	50% WDG	0.1-0.25 oz	No more than 2-3 sequential applications	11
triticonazole	Trinity	19.2% L	0.5-2 fl oz	No more than 6 fl oz/1000 sq ft/year	3
vinclozolin	Curalan Touché	50 EG	1 oz	<b>Not for use on residential lawns!</b> 10- to 21-day interval; maximum of 3 oz/1000 sq ft/year.	2
<b>Combination Products</b>					
azoxystrobin + propiconazole	Headway		0.75-3 fl oz (see label)	No more than 2-3 sequential applications; no more than 23.75 fl oz/1000 sq ft/year	11 + 3

## Turfgrass

Common Name	Trade Name (example)	Formulation(s)	Rate(s) (/1,000 sq ft)	Comments	FRAC Code
chlorothalonil + azoxystrobin	Renown	45% + 3%	2.5-4.5 fl. oz.	<b>Not for use on home lawns or turf associated with apartments, daycare centers, playgrowunds, athletic fields next to schools (elementary through high school)!</b> See label	M5 + 11
chlorothalonil + fenarimol	Twosome		2.9-7.8 fl oz	<b>Not for use on home lawns!</b> See label	M5 + 3
chlorothalonil + propiconazole + fludioxonil	Instrata		2.75-11 fl oz (see label)	<b>Not for use on home lawns!</b> See label	M5 + 3 + 12
chlorothalonil + thiophanate-methyl	Consys Spectro 90 Peregrine Quali-Pro TM/C	67% WDG 90% WDG	2-5 oz 3-5.76 oz	<b>Not for use on residential lawns!</b> See label	M5 + 1
fluopicolide + propamocarb hydrochloride	Stellar	5.54% + 55.4% SC	1.2 fl oz	<b>For use on golf courses and sod farms only.</b> See label.	43 + 28
iprodione + thiophanate-methyl	26/36 Emblem TM + IP		1-4 fl oz (see label)	<b>Not for use on residential lawns or commercial sod!</b> No more than 14.5 fl oz/1000 sq ft/year; no more than 6 applications/year	2 + 1
mancozeb + copper hydroxide	Junction	DF	2-4 oz	Do not apply in spray solution with pH less than 6.5	M3 + M1
pyraclostrobin + boscalid	Honor	WG	0.55-1.1 oz.	<b>For use on golf courses only!</b> See label.	11 + 7
thiophanate-methyl + flutolanil	SysStar	80% WDG	2-3 oz	See label	1 + 7
trifloxystrobin + triadimefon	Armada Tartan	25% L 50% WP	1-2 fl oz 0.6-1.2 oz	No more than 2-3 sequential applications (see label)	11 + 3