

TURF

INSECT CONTROL IN COMMERCIAL TURF

Will Hudson, Extension Entomologist

Note on insecticide selection and use for various turf sites:

Not all turfgrass sites are created equal. It is important to read the label on the product before purchasing an insecticide for a particular site use. An insecticide may not be labeled for all turfgrass uses (e.g., lawns, athletic field, sod farms, or golf course). Some products are only labeled for use on golf courses or sod farms. For example, Dursban 50W (chlorpyrifos) is not labeled for use on residential or commercial lawns. Furthermore, Orthene (acephate) formulations are labeled for use against fire ants in residential and commercial lawns, but not other pests.

In some instances, manufacturers will add GC as part of the title to inform users that a product can be used on golf courses when other formulations of that product are not labeled for that site. For example, Allectus SC is not labeled for use on golf courses but Allectus GC SC is. Labeling for sod farms will also follow similar rules. For example, Merit 0.5 G is not to be used on sod farms, but Merit 2 and Merit 75WP are labeled for use on sod farms.

If product restrictions are noted on the label, they may appear as a note next to the product names in this publication. For example, when you read, "landscape turf only" that product is not available for use on golf course or sod farms. When a product labeled for these other sites is available it is included but it may not have any restrictions noted. If no restrictions are noted, the product is likely labeled for general use on turfgrass or on all turfgrass sites. The label on your individual product may vary from the online version of the manufacturer's labels, therefore abide by all restrictions on the product label if they differ from those presented in this guide

Restricted Use Pesticides (RUPs), those that only a certified pesticide applicator may use, supervise the use of, or purchase, will be noted. Uncertified pesticide applicators may not purchase, use or supervise the use of these products.

PESTS	INSECTICIDE AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
Imported Fire Ants/Ants	Bait treatments: Indoxacarb Advion	4 Tbps/mound or 1.5 lb/acre	<p>The most effective method for control of ants over a broad area is the use of a broadcast bait two times per year (spring/fall) coupled with individual mound treatments as needed.</p> <p>Broadcast Bait Treatments Broadcast baits when ants are actively foraging for food (typically, warm, dry days in spring and fall). Some baits work within 48 hrs., some may take a month. Avoid applying baits just before or after irrigation or rain.</p> <p>Individual Mound Treatments Do not disturb mounds before treatment. <i>Drenches:</i> Drench mounds when queen and brood are located close to soil surface on warm, dry days. Generally, it takes 1-2 gallons of water to drench a fire ant mound effectively. <i>Granules:</i> Scatter granules around the edge of the nest, not on top.</p> <p><u>Products cleared for pasture/rangeland use</u> Amdro Award Extinguish Distance Logic Pounce Pyrenone Siege Pro</p>
	hydromethylnon Amdro	5 Tbps/mound or 1-1.5 lb/acre	
	fenoxycarb Award	1-3 Tbps/mound or 1-1.5 lb/acre	
	methoprene Extinguish	1.5 lb/acre	
	Mound Drench Treatments: acephate Orthene TTO 75WP	1 oz./5 gal	
	Orthene TTO 97	0.75 oz./5 gal	
	bifenthrin Talstar GC Flowable	RUP 1 tsp/gal	
	carbaryl Sevin SL	0.75 fl oz./gal	
	chlorpyrifos Dursban 50W (golf course and sod farms only)	RUP 0.24 oz./gal	
	Dursban Pro	1 fl oz./2 gal	
	deltamethrin DeltaGard GC 5SC	RUP 1.5 fl oz./gal	

INSECT CONTROL IN COMMERCIAL TURF (continued)

PESTS	INSECTICIDE AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
Imported Fire Ants/Ants (cont.)	imidacloprid + bifenthrin Allectus GC SC <i>(golf course and sod farms only)</i>	RUP 0.33 fl oz./gal	
	Allectus SC <i>(landscape turf only)</i>	0.33 fl oz./gal	
	lambda-cyhalothrin Scimitar CS <i>(landscape turf only)</i>	RUP 0.5 fl oz./2.5 gal	
	Scimitar GC	0.5 fl oz./2.5 gal	
	permethrin Astro <i>(landscape turf only)</i>	RUP 1.6 fl oz./gal	
	spinosad Conserve	0.1 fl oz./gal	
	Dry mound treatments:		
	acephate Orthene TTO 75WP	1-2 tsp/mound	
	cyfluthrin Bayer Fire Ant Killer	1 tsp/mound	
	deltamethrin Bengal Ultra Dust Fire Ant Killer (0.05%)	RUP 1 Tbsp/mound	
	Terro Fire Ant Killer (0.05%)	1 Tbsp/mound	
	DeltaGard G <i>(landscape turf only)</i>	2 Tbsp/mound**	
	imidacloprid + bifenthrin Allectus GC <i>(golf course and sod farms only)</i>	RUP 4 oz./mound**	
	Allectus G <i>(landscape turf only)</i>	4 oz./mound**	
	Broadcast Treatments:		
	bifenthrin Talstar GC Flowable	RUP 0.5 fl oz./1,000 sq ft	
	Talstar EZ Golf Granular	2.3-4.6 lb/1,000 sq ft	
	carbaryl Sevin SL	3 fl oz./1,000 sq ft	
	chlorpyrifos Dursban 50W <i>(golf course and sod farms only)</i>	RUP 16 lb/acre	
	Dursban Pro	1.5 fl oz./1,000 sq ft	

** Follow with 1-2 gallons water for best results

INSECT CONTROL IN COMMERCIAL TURF (continued)

PESTS	INSECTICIDE AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
Imported Fire Ants/Ants (cont.)	cyfluthrin Tempo SC Ultra <i>(landscape turf only)</i>	RUP 8 ml/1,000 sq ft	
	Tempo WP Ultra <i>(landscape turf only)</i>	5-10 g (1-2 scoops) / 1,000 sq ft	
	Tempo WP GC <i>(golf course and sod farms only)</i>	1 packet/7,800 sq ft	
	deltamethrin DeltaGard GC 5SC	RUP 1.5 fl oz./gal	
	DeltaGard T&O 5SC <i>(landscape turf only)</i>	1.5 fl oz./gal	
	DeltaGard G <i>(landscape turf only)</i>	1.5 fl oz./gal	
	fipronil Quali-Pro Fipronil 0.0143% Fipronil 0.1% Chipco Choice	<i>(See labels for rates and restrictions.)</i>	
	imidacloprid + bifenthrin Allectus GC SC	RUP 1.32-1.65 fl oz./1,000 sq ft	
	Allectus SC <i>(landscape turf only)</i>	1.32-1.65 fl oz./1,000 sq ft	
	Allectus GC	1.7-2.9 lb/1,000 sq ft	
	Allectus G <i>(landscape turf only)</i>	1.7-2.9 lb/1,000 sq ft	
	lambda cyhalothrin Scimitar CS <i>(landscape turf only)</i>	RUP 7 ml/1,000 sq ft	
	Scimitar GC	7 ml/1,000 sq ft	
Bees and Wasps (burrowing)	acephate Surrender, others	1-2 tsp/hole <i>(do not exceed this amount in 1 sq ft)</i>	Apply in late afternoon or early evening at insect entrance/exit holes.
	carbaryl 10% Sevin granules	1.4-1.9 lb/1,000 sq ft <i>Water in after application</i>	Bee, wasp, and hornet sprays in pressurized cans are also effective. Follow label instructions.
	various pyrethroids*	See label	

INSECT CONTROL IN COMMERCIAL TURF (continued)

PESTS	INSECTICIDE AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
Chinch bugs	acephate Orthene TTO 75WP	1.2-2.4 oz./1,000 sq ft	Reducing the number of treatments and applying spot treatments (which is most effective especially early in the season) will allow for the conservation of natural enemies, as native parasites and predators can play a significant role in chinch bug management.
	Orthene TTO 97 <i>(golf course and sod farm only)</i>	0.9-1.8 oz./1,000 sq ft	
	bifenthrin Talstar EZ Golf Granular	RUP 2.3-4.6 lb/1,000 sq ft	
	Talstar GC Flowable	0.25-0.5 fl oz./1,000 sq ft	Pyrethroids are effective, but they provide no residual control and evidence of resistance has already surfaced for bifenthrin (Talstar, Bifen), with cross-resistance to other pyrethroids expected. Rotation of chemistries is, therefore, important.
	carbaryl Sevin 80 WSP	7.5-10 lb/acre	
	Sevin SL	6-8 fl oz./1,000	
	clothianidin Arena 50WDG	10.67 oz./acre	In most cases, irrigate turf area prior to application unless noted otherwise on the product label.
	Arena 0.5G	66.67 lb/acre	
	cyfluthrin Tempo SC Ultra <i>(landscape turf only)</i>	RUP 8 ml/1,000 sq ft	Granules can be used but must be watered in thoroughly. Use high volume application (5 gal/1000 ft ²) especially with pyrethroids.
	Tempo WP Ultra <i>(landscape turf only)</i>	7.7-15.4 oz./acre	
	Tempo 20 WP <i>(golf course only)</i>	1 packet/7,800 sq ft	
	deltamethrin DeltaGard T&O 5SC <i>(landscape turf only)</i>	RUP 0.6-0.9 fl oz./1,000 sq ft	
	DeltaGard GC 5SC	0.6-0.9 fl oz./1,000 sq ft	
	DeltaGard G <i>(landscape turf only)</i>	2-3 lb/1,000 sq ft	
	DeltaGard T&O Granular	2-3 lb/1,000 sq ft	
	imidacloprid + bifenthrin Allectus SC <i>(landscape turf only)</i>	RUP 0.4-1.65 fl oz./1,000 sq ft	
	Allectus GC	1.7-2.9 lb/1,000 sq ft	
	lambda-cyhalothrin Scimitar CS <i>(landscape turf only)</i>	RUP 19.2 oz./acre	
Scimitar GC	19.2 oz./acre		
trichlorofon Dylox 80	3.75 oz./1,000 sq ft		

INSECT CONTROL IN COMMERCIAL TURF (continued)

PESTS	INSECTICIDE AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
Turf caterpillars (cutworms, armyworms, webworms, loopers)	acephate Orthene TTO 75WP	0.5-1.2 oz./1,000 sq ft	Caterpillar pests are best controlled with insecticides in the early instars when they are still small. Higher rates must be used for larger caterpillars. Reduced-risk products like B.t., Mach 2, and Conserve are also more effective against younger caterpillars. On larger caterpillars even higher rates of these products may not be effective. A number of chemicals listed for control are broad-spectrum and fairly economical, especially chlorpyrifos, acephate, carbaryl and several labeled pyrethroids. Newer products such as spinosad and halofenozide are also effective but not as economical as some of the other choices. Treat in late afternoon. DO NOT cut grass for 1-3 days after application. B.t. is not toxic to non-lepidopterous pests.
	Orthene TTO 97 <i>(golf course and sod farm use only)</i>	0.4-0.9 oz./1,000 sq ft	
	bifenthrin Talstar GC Flowable	RUP 0.25-0.5 fl oz./1,000 sq ft or 10 fl oz./acre	
	carbaryl Sevin 80 WSP	2.5-5 lb/acre	
	Sevin SL	1.5-3 fl oz./1,000 or 2-4 qt/acre	
	cyfluthrin Tempo SC Ultra <i>(landscape turf only)</i>	RUP 4-8 mL/1,000 sq ft or 6-12 fl oz./acre	
	Tempo 20 WP <i>(golf course only)</i>	55 g/7,800-11,000 sq ft	
	deltamethrin DeltaGard GC 5SC	RUP 0.2-0.4 fl oz./1,000 sq ft or 8.75-17.5 fl oz./acre	
	Acelepyrn	2-16 ozs./acre	
	Aloft LCSC	11.65-23 .3 fl. oz./acre	
	halofenozide Mach 2 2SC	1.5 fl oz./1,000 sq ft or 2 qt/acre	
	lambda-cyhalothrin Scimitar CS <i>(landscape turf only)</i>	RUP 3.4-7 ml/1,000 sq ft or 5-10 fl oz./acre	
spinosad Conserve 1SC	0.25-0.8 fl oz./1,000 sq ft or 10-35 fl oz./acre		
trichlorfon Dylox 80 T&O	2.5-3.75 oz./1,000 sq ft or 6.8-10.2 lb/acre		
Ground Pearls	None		No effective chemical control. Practice good management.
Mole Crickets	acephate Orthene TTO 75WP	1-1.9 oz./1,000 sq ft	Best results with early instar nymphs. Fipornil is a widely used insecticide that has proven to be the most effective and most expensive single application approach. Since it provides season-long control the economics must be considered in that context. Indoxacarb, acephate, the bifenthrin + imidacloprid combination and chlorpyrifos baits are available for use against larger nymphs in late summer. The pyrethroids and imidacloprid are less effective, particularly on larger nymphs and adults. Imidacloprid should be applied at or just before egg hatch.
	Orthene TTO 97 <i>(golf course and sod farm use only)</i>	0.8-1.4 oz./1,000 sq ft	
	bifenthrin Talstar GC Flowable	RUP 0.25-0.5 fl oz./1,000 sq ft	
	Talstar GC Granular	2.3-4.6 lb/1,000 sq ft	
	carbaryl Mole Cricket Bait	0.75-0.9 lb/1,000 sq ft	
	clothianidin Arena 50 WDG	Suppression only 10.67 oz./acre	
	Aloft LC SC	11.65-23.3 ozs.	

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PESTS	INSECTICIDE AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
Mole Crickets (continued)	cyfluthrin Tempo WP Ultra	RUP 7.7-15.4 oz./acre	
	Tempo SC Ultra	8 mL/1,000 sq ft or 12 fl oz./acre	Clothianidin less susceptible to photodegradation than imidacloprid
	deltamethrin DeltaGard GC 5SC	RUP 0.6-0.9 fl oz./1,000 sq ft	
	DeltaGard T&O Granular (<i>landscape turf only</i>)	2-3 lb/1,000 sq ft	For most treatments irrigate 24 hrs. before treatment if soil is dry. Apply in late afternoon to dry turf, then do not irrigate for 48 hrs.
	fipronil Chipco Topchoice	2 lb/1,000 sq ft	
	imidacloprid Merit 75 WSP	1.6 oz./8,250 sq ft	Many brands and formulations of imidacloprid are available. Read label carefully.
	Merit 0.5G (<i>not for sod farms</i>)	1.8 lb/1,000 sq ft	
	imidacloprid + bifenthrin Allectus SC (<i>landscape turf only</i>)	RUP 1.32-1.65 fl oz./1,000 sq ft	
	Allectus GC	2.9 lb/1,000 sq ft or 4.6-5.7 lb/1,000 sq ft	
	lambda-cyhalothrin Scimitar CS (<i>landscape turf only</i>)	RUP Nymphs: 7 mL/1,000 sq ft Adults: 14 mL/1,000 sq ft	
	Scimitar GC	Nymphs: 7 mL/1,000 sq ft Adults: 14 mL/1,000 sq ft	
	permethrin Astro (<i>landscape turf only</i>)	RUP 1.6 fl oz./gal	
	trichlorfon Dylox 80 T&O	3.75 oz./1,000 sq ft	
	Dylox 6.2 G	3 lb/1,000 sq ft	
Spittlebugs	acephate Orthene TTO 75WP	1 – 1.9 oz. /1,000 sq ft	Pesticides used to suppress two-lined spittlebugs have historically included chlorpyrifos, acephate and diazinon. With their removal from the residential turf arena, very few effective chemical options are available.
	Orthene TTO 97	0.8 – 1.4 oz. / 10,000 sq ft	
	bifenthrin Onyx	RUP 0.07 – 0.15 fl oz. / 1,000 sq ft	Pyrethroids applied with sufficient volume of water have been effective but not always consistently.
	carbaryl Sevin SL	1.5 – 3 fl oz. /1,000 sq ft or 2 - 4 qt / acre	
	Sevin 80 WSP	2.5 – 5 lb/acre	
	deltamethrin DeltaGard GC 5SC	RUP 0.2 – 0.4 fl oz. / 1,000 sq ft or 8.75 – 17.5 fl oz./acre	Cut grass to its recommended height and remove clippings prior to application.
	DeltaGard T&O 5 SC (<i>landscape turf only</i>)	0.2 – 0.4 fl oz. / 1,000 sq ft or 8.75 – 17.5 fl oz./acre	
	Aloft LCSC	11.65-23 .3 ozs./acre	

INSECT CONTROL IN COMMERCIAL TURF

PESTS	INSECTICIDE AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
White Grubs (Japanese Beetle, Chafers, Green June Beetle)	carbaryl Sevin SL	6 fl oz./1,000 sq ft or 8 qt/acre	<p>Best results can be expected if early instars are treated.</p> <p>The number of grubs per square foot or damage threshold varies by grub species, grass species and variety, and management intensity or use.</p> <p>Identification of pest grub species is important for effective control recommendations. Consult your County Extension Agent.</p> <p>Carbaryl and chlorpyrifos excellent for June beetle control, less effective on other species. Generally a good adult control.</p> <p>Clothianidin may not be as effective on grubs or have as long of a residual as imidacloprid.</p> <p>In areas with historical grub infestations, preventive treatments of imidacloprid or halofenozide provide excellent control of young grubs.</p> <p>Curative control of older larvae is excellent with trichlorfon for most grub species and good with bifenthrin, chlorpyrifos and carbaryl against green June beetle grubs.</p>
	Sevin 80 WSP	10 lb /acre	
	clothianidin Arena 50WDG	8 oz. / acre	
	Arena 0.5G	50 lb /acre	
	halofenozide Mach 21.5 G	133 lb / acre	
	Mach 2 SC	2.9 fl oz. /1,000 sq ft	
	imidacloprid Merit 75 WSP	8.6 oz. / acre	
	Merit 0.5 G	1.4 lb / 1,000 sq ft or 60 lb / acre	
	imidacloprid + bifenthrin Allectus SC <i>(landscape turf only)</i>	RUP 1.32 – 1.65 fl oz./1,000 sq ft	
	Allectus GC	2.3 – 2.9 lb / 1,000 sq ft	
	trichlorfon Dylox 80 T&O	3.75 oz. / 1,000 sq ft or 10.2 lb / acre	
	Dylox 6.2 G	3 lb / 1,000 sq ft or 130 lb / acre	
Acelepryn	8-16 ozs./acre		
Billbugs	bifenthrin Talstar EZ Golf Granular	RUP 1.15 – 2.3 lb/ 1,000 sq ft	<p>The sporadic occurrence and multiple generation of this pest make its appearance unpredictable. Some areas that consistently experience billbug injury may be treated in a prophylactic manner.</p>
	Talstar GC flowable carbaryl Sevin SL	0.25 – 0.5 fl oz./ 1,000 sq ft 6 fl oz./1,000 sq ft or 8 qt/acre	
	Sevin 80 WSP	10 lb/acre	
	chlorpyrifos Dursban 50W	RUP 2 – 4 lb/acre	
	chlorthiandin Arena 50WDG	8 oz./acre	
	Arena 0.5G	50 lb/acre	
	halofenozide Mach 2 1.5 G	133 lb/acre	
	Mach 2 SC	2.9 fl oz./1,000 sq ft	
	imidacloprid Merit 75 WSP	1.6 oz./8250 sq ft or 8.6 oz./acre	
	Merit 0.5 G	1.4 lb/1,000 sq ft or 60 lb/acre	

INSECT CONTROL IN COMMERCIAL TURF

PESTS	INSECTICIDE AND FORMULATION	RATE	REMARKS AND PRECAUTIONS
Billbugs (continued)	imidacloprid + bifenthrin Allectus GC SC	RUP 0.4 – 1.65 fl oz./1,000 sq ft	
	Allectus GC	1.7 – 2.9 lb/1,000 sq ft	
	trichlorfon Dylox 80 T&O	3.75 oz./1,000 sq ft or 10.2 lb/acre	
	Dylox 6.2 G	3 lb/1,000 sq ft or 130 lb/acre	
	Acelepryn	8-20 ozs.	
	NOTE: Premixed formulations of systemic insecticides with pyrethroids are available (Allectus, Aloft). These may provide control of multiple pests with a single spray.		
Slugs and Snails	Metaldehyde or mesurol	Follow label directions for mixed baits	Apply late in afternoon. Fall applications will help control slugs and snails before egg laying.
Millipedes, sowbugs and pillbugs	bifenthrin Talstar F, GC, G	RUP 0.25-0.5 fl oz./1,000 sq ft	
	carbaryl Sevin 80 WSP	1.5-3.0 oz./1,000 sq ft	
	various pyrethroids*	See label	

*NOTE: A number of pyrethroid materials are available in a variety of formulations for use as broad-spectrum contact insecticides. Common names include permethrin, bifenthrin, cypermethrin, cyfluthrin, lambda-cyhalothrin and deltamethrin.

TURF DISEASE CONTROL

Alfredo Martinez, Extension Plant Pathologist

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Algae	Chlorothalonil (Daconil Ultrex, Daconil Weatherstik, Daconil Zn, Daconil Action, Echo DF, Legend, Manicure, Evade, Pegasus DFX)	1.8 to 7.4 oz. at 7-14 day intervals	Make sure surface drainage is good. Spike, slice or aerify if necessary. Recent label changes by manufacturers restrict use on commercial turf only and not to be used on home lawns.
	Copper Hydroxide (Kocide 54 DF)	16 oz.	1 application
	Hydrogen dioxide (Zerotol, TerraCyte Pro)	6-25 oz.	Curative control may require 2-3 consecutive applications. Drench the soil to saturate root system. Use on 5-10 gal per 1000 sq ft.
	Mancozeb (Fore, Manzate, Protect T/O, Dithane)	80WP - 6 oz. 4F - 9.6 fl. oz.	
	Mancozeb + Copper Sulfate (Junction)	2-4 oz. At 7-14 day intervals	May cause phytotoxicity during hot weather.
	Triticonazole (Trinity, Triton)	0.5 to 1.0 fl. oz. at 14-28 day intervals	For algae suppression.
	Triticonazole + Chlorothalonil (Reserve)	3.2 to 5.4 oz. at 14 to 28 day intervals	Use preventively the lower rate for the suppression of algae.
Brown Patch (<i>Rhizoctonia solani</i>) and Dollar Spot (<i>Sclerotinia homoeocarpa</i>)	Azoxystrobin (Heritage 50WG, TL, Heritage G)	0.2 to 0.4 oz. at 14 to 28 day intervals 2 to 4 lb at 14-28 days intervals	*Not Recommended for Dollar Spot.
	Azoxystrobin + Chlorothalonil (Renown)	2.5 to 4.5 fl. oz. at 7 to 28 day intervals	
	Azoxystrobin + Propiconazole (Headway)	0.75-3 oz. at 14 to 28 days intervals	
	Boscalid (Emerald)	0.13 to 0.18 oz. at 14 to 21 day intervals	*For Dollar Spot control only. Apply when conditions are favorable for disease development.
	<i>Bacillus licheniformis</i> (EcoGuard SB 3086)	Up to 20 oz. at 3-14 days intervals	
	<i>Bacillus subtilis</i> Strain QST713 (Rhapsody, Sonnet)	2.0 to 10 fl. oz. at 7-10 day intervals	Apply in sufficient water to provide thorough coverage. 2 gal /1000 ft ² are commonly used.
	<i>Bacillus subtilis</i> Strain GB03 (Companion)	4.0 to 6 fl. oz. 14-28 day intervals	
	Chlorothalonil (Daconil Ultrex, Daconil Weatherstik, Daconil Zn, Daconil Action, Echo DF, Legend, Manicure, Evade, Pegasus DFX, ArmorTech CLT720, ArmorTech CLT825)	Flowable 40.4% Preventive: Brown Patch - 3-6 fl. oz. at 7-10 day intervals Dollar Spot - 3-6 fl. oz. at 7-14 day intervals Curative: Brown Patch - 6-11 fl. oz. at 7-10 day intervals Dollar Spot - 6-11 fl. oz. at 7-14 day intervals Wettable Powder (WDG90) Preventive: Brown Patch - 1.75-3.5 oz. at 7-10 day intervals Dollar Spot - 1.75-3.5 oz. at 7-14 day intervals. 4 oz. = 15 Tbs. Curative: Brown Patch - 3.5-6.5 oz. at 7-10 day intervals Dollar Spot - 3.5-6.5 oz. at 7-14 day intervals	Recent label changes by manufacturers restrict use on commercial turf only and not to be used on home lawns.
	Chlorothalonil + Propiconazole (Concert, Concert II)	1.5 to 3 fl. oz. at 7 to 10 days 3 to 5.5 fl. oz. at 14 to 21 days 5.5 to 8.5 fl. oz. at 14 to 28 days	

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Brown Patch (<i>Rhizoctonia solani</i>) and Dollar Spot (<i>Sclerotinia homoeocarpa</i>) (cont.)	Chlorothalonil + Propiconazole + Fludioxonil (Instrata)	2.75 to 6 fl. oz. at 21 to 28 days	
	Chlorothalonil + Thiophanate methyl (Consyst, Spectro, Peregriane, Tee-1-up WDG, TM + CTN SPC)	2 to 8 oz. at 7 to 21 days 2 to 5.76 oz. at 7 to 14 days	
	Hydrogen dioxide (Zerotol, TerraCyte Pro)	6-25 oz.	Curative control may require 2-3 consecutive applications.
	Fenarimol (Rubigan A.S. 11.6)	0.75 - 1.5 fl. oz. at 10-21 day or 14-28 day intervals respectively for Dollar Spot	
	Fludioxonil (Medallion)	0.5 to 0.9 oz. at 14-28 day intervals	Use as preventative. Begin application when conditions are favorable for fungal infection; prior to disease symptom development.
	Flutolanyl (ProStar 70WP)	Preventive: 2.2 oz. at 21-28 day intervals Curative: 4.5 oz. Repeat in 30 days.	Use of wetting agent or aeration prior to treatment may improve disease control. Do not treat more than 10,000 ft. per acre of turfgrass
	Flutolanyl + thiophanate methyl (Systar)	2 to 3 oz. at 14 to 30 days	
	Fluoxastrobin (Disarm 480 SC Disarm G)	0.18 to 0.36 fl. oz. at 21 day intervals 2.3 to 4.6 lb at 14 to 21 days	Recommended for Brown Patch. For optimum results begin applications preventatively and continue as needed (21 day intervals). To limit the potential for development of fungicide resistance use a maximum of 2 sequential applications of a QoI fungicide followed by at least an equal number of applications of another mode of action fungicide. Preventive control of light to moderate dollar spot infections
	Fluoxastrobin + Chlorothalonil (Disarm C)	3 to 5.9 oz. at 7 to 28 days	
	Fluoxastrobin + Myclobutanil (Disarm M)	0.25 to 1.0 oz. at 14 to 28 days	
	Iprodione (Chipco 26GT, Chipco 26019, Iprodione Pro 2SE, Raven, 18Plus, ArmorTech IP233, Iprodione SPC)	2-4 fl. oz. in 2-10 gals. water. Apply every 14-21 days. 1.5 oz. = 9 Tbs 1.5-2.0 oz. At 14-21 day intervals 3-4 fl. oz. at 14-28 day intervals	Not for use in residential areas
	Iprodione + trifloxystrobin (Interface)	4 to 6 oz. at 14 to 21 day intervals	
	Mancozeb + Copper Hydroxide (Junction)	2-4 oz. at 7-14 day intervals	
	Maneb, Maneb + zinc sulfate, Mancozeb (Tersan LSR, Fore, Dithane, Protect T/O, etc.)	Preventive: 3-4 oz. in 3-5 gals. water at 7-10 day intervals Curative: 6-8 oz. in 3-5 gals. water at 7-10 day intervals 3 oz. = 10 Tbs.	
	Metconazole (Tourney)	Dollar Spot – 0.18 to 0.37 oz. at 14-21 day intervals Brown Patch – 0.28 to 0.37 oz. at 14-21 day intervals	Apply when conditions are favorable for disease development. Do not use on bermudagrass.
	Mineral Oil (Civitas)	8 to 32 oz.	Use only in conjunction with Civitas Harmonizer
	Myclobutanil (Eagle 40WSP, ArmorTech Myclo 20EW)	Preventive: 0.6 oz. at 10-28 day intervals (3 oz. pkt/5000 ft ²) Myclo 20EW 1.2-2.4 oz	Do not apply more than 7.2 oz./1000 ft ² per year.
	PCNB (Engage, Penstar, Revere, Terraclor, Turfcide)	Brown Patch – warm season grasses - 16 oz. in 10 to 15 gal. water at 3-4 weeks; cool season grasses - 3-4 oz. in 3 to 6 gal. water at 7-10 days Dollar Spot – 7 to 10 oz. in 5 to 10 gal. water at 3 to 4 weeks	

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Brown Patch (<i>Rhizoctonia solani</i>) and Dollar Spot (<i>Sclerotinia homoeocarpa</i>) (cont.)	Phosphorous acid (Fosphite)	2 to 3 fl. oz.	
	Polyoxin D (Endorse, Affirm)	4 oz. in a minimum of 2 gallons at 14 day intervals. 2.4 lbs/acre at 7-14 day intervals	Do not irrigate for 12 hrs after application. *Not recommended for Dollar Spot.
	Propiconazole (Banner Maxx, Banner GL, Savvi, Prophesy, Kestrel, Spectator, ArmorTech PPZ143MC, Strider, Propiconazole SPC 14.3)	1-2 fl. oz. (Dollar Spot & Brown Patch). 2-5 gals. water at 14-28 day intervals for dollar spot and 14-21 day intervals for Brown Patch. As conditions become more severe, use the shorter application schedule and the higher rate. Banner GL individual packets; one packet treats 11,000-22,000 ft ²	Do not mow or irrigate treated areas until grass is completely dry. Do not use on home lawns. Bermudagrass and St. Augustine grass can be sensitive to Banner. Do not exceed 2 fl. oz. per 1000 ft ² every 30 days on any variety of Bermudagrass or St. Augustinegrass.
	Pyraclostrobin (Insignia, Insignia Intrinsic)	0.5 - 0.9 oz. at 14-28 day intervals	For Dollar Spot, begin applications prior to or in the early stages of disease development. Use shorter specified application interval and / or higher specified rate when prolonged favorable disease conditions exist.
	Pyraclostrobin + Boscalid (Honor, Honor Intrinsic)	Brown patch= 0.55 to 1.1 oz. at 14 to 28 day intervals Dollar Spot= 0.88 to 1.1 oz. at 14 to 21 day intervals	
	Tebuconazole (Torque, ArmorTech TEB360)	0.6 fl. oz.	For prevention, begin applications when conditions are favorable for disease development. Do not make two consecutive applications of Torque fungicide. Alternate with another fungicide with different mode of action. A second application may be made after 28 days
	Thiophanate methyl (Cleary's, 3336, 3336 G, 3336 F, 3336 Plus, 3336 GC, 3336DG lite, T-Methyl SPC 4.5, T-Methyl SPC 50T-Methyl G, Fungo, Cavalier, Systec 1998, T-storm, Armortech TM462)	Wettable Powder (50%) 2 oz./5 gals. water Apply at 7-10 day intervals Dollar spot fairways—1 oz./5 gals water Apply at 2-4 week intervals Flowable 46.2 % 1-2 fl. oz. at 10-14 day intervals TM462 2-5.3 fl oz	
	Thiophanate methyl + Iprodione (26/36, Dovetail, ArmorTech TMI 2020, TM + IP SPC)	1.1 to 2.1 oz. at 7 to 14 days	
	Thiram (Spotrete F)	Preventative: 3 ¼ fl. oz. at 7-10 day intervals Curative: 7 ½ fl. oz. at 3-5 day intervals	For best results use spray mix the same day it is prepared. Spray right after mowing or avoid mowing 12 hrs after application.
	Triadimefon (Bayleton 25WP) Granular turf fungicide, Systemic fungicide, Fungicide VII Bayleton 50, Bayleton Flo)	Preventive: 1 oz./2-4 gals. water Curative: 2 oz./2-4 gals. water. 1 oz. = 6 Tbs. Preventive. 1.5 lb at 15-30 day intervals Curative. 3 lb at 15-30 day intervals Syst. Fung. 0.5-1 oz. At 15-30 day intervals Bayleton 50 and Flo 0.5 -1.0 oz	Apply recommended rate at 15-30 day intervals. Protective activity can be longer than 30 days depending on environmental conditions. After the application of curative rate, subsequent applications should be applied on a preventative schedule and rate. For golf and sod. Not to be used on residential or commercial areas
	Trifloxystrobin (Compass)	Preventive: 0.1-0.2 oz. in 1-2 gals. of water per 1000 ft ² at 14 day intervals Curative: 0.15-0.25 oz. in 1-2 gals. of water per 1000 ft ²	Apply when conditions are favorable for disease development. Apply 0.2 oz. and repeat on a 21 day intervals. During periods of Dollar Spot pressure, mix Compass with fungicides labeled for Dollar Spot.
	Trifloxystrobin + Triadimefon (Tartan, Armada)	1 to 2 oz. at 14 to 28 days 0.6 to 1.2 oz. at 14 to 28 days	
	Triticonazole (Trinity, Triton)	0.5 to 1.0 fl. oz. for Dollar Spot at 14-28 day intervals. 0.5 to 2.0 fl. oz. for Brown Patch at 14-28 day intervals.	2 fl. oz. rates may be applied if needed in transition areas of the South under heavy disease pressure.
	Vinclozolin (Curalan, Touche) (For Dollar Spot)	2 oz. /5 gals. water 2 oz. = 8.5 tbs	Repeat application in 1-3 weeks while disease conditions prevail. Toxic to fish.
Triticonazole + Chlorothalonil (Reserve)	For Brown Patch 3.2 to 5.4 oz. at 14 to 28 day intervals For Dollar Spot 3.2 to 4.5 oz. at 14 to 28 day intervals	For Brown patch, begin fungicide applications preventatively when conditions are favorable for disease development. For Dollar spot, begin fungicide applications preventatively	

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Fairy Ring	Azoxystrobin (Heritage 50WG, Heritage TL, Heritage G)	0.4 oz. applied at 28 day intervals 2 to 4 lb at 14-28 days intervals	
	Azoxystrobin + propiconazole (Headway)	3 oz. at 28 days intervals	
	Hydrogen dioxide (Zerotol, TerraCyte Pro)	2- to 12 fl. oz.	Curative control may require 2-3 consecutive applications. Drench the soil to saturate root system. Use on 5-10 gal per 1000 sq ft
	Flutolanil (ProStar 70WP)	Preventive: 2.2 oz. at 21-28 day intervals Curative: 4.5 oz. at first sign of activity Repeat in 30 days. Apply in 10 to 50 gals. water/1000 ft ² .	Use of wetting agent or aerification prior to treatment may improve disease control. Do not treat more than 10,000 ft. Per acre of turfgrass.
	Flutolanil + thiophanate methyl (Systar)	3 to 6.12 oz. at 21 to 28 days	
	Fluoxastrobin (Disarm 480 SC Disarm G)	0.36 fl. oz. at 28 day intervals	
	Fluoxastrobin + Chlorothalonil (Disarm C)	4.5 to 5.9 oz. at 21 to 28 days	
	Fluoxastrobin + Myclobutanil (Disarm M)	0.5 to 1.0 oz. at 21 to 28 days	
	Metconazole (Tourney)	0.37 oz.	Apply in 4 gal water/1000 ft ² . Symptoms may take several weeks to disappear following application. Do not use on bermudagrass.
	Pyraclostrobin (Insignia, Insignia Intrinsic)	0.5 to 0.9 oz. at 14-28 day intervals	Use as preventative. Begin application when conditions are favorable for fungal infection; prior to disease symptom development.
	Pyraclostrobin + Boscalid (Honor, Honor Intrinsic)	1.1 oz. at to 28 day intervals	
	Polyoxin D (Endorse, Affirm)	4 oz. in a minimum of 2 gallons at 14 day intervals. For Affirm use 1 oz. 2-3 applications at 7 day intervals	Make 2-3 applications. Use a penetrating wetting agent. Water in immediately after treatment.
	Tebuconazole (Torque)	0.6 fl. oz.	Preventative = apply before fairy ring symptoms appear in the spring when soil temperatures consistently reach 55-60 °F. water into root zone within 4 hrs. Do not tank mix a wetting agent with preventive applications. Curative = Water into root zone within 4 hrs. Use a wetting agent as required for penetration of active hydrophobic soil conditions. A second application after 28 days may be required.
	Triadimefon (Bayleton 25WP; Bayleton 50, Bayleton Flo)	1-2 oz or fl oz	Apply recommended rate in 2 - 4 gallons of water in the spring prior to appearance of fairy ring symptoms. Before the spray dries, irrigate to wash the fungicide into the thatch/soil where the fungus is active. Repeat application 14 days later. If the 2 ounce rate is used on Poa annua putting greens, extend the interval to 21 days. For golf and sod. Not to be used on residential or commercial areas
Fusarium/ Microdochium	Azoxystrobin (Heritage 50 WG, TL, G)	0.2 to 0.4 oz. at 14 to 28 day intervals 4 lb at 10-28 days intervals 7 lb single application	
	Azoxystrobin + Chlorothalonil (Renown)	2.5 to 4.5 fl. oz. at 14 to 21 day intervals	
	Azoxystrobin + Propiconazole (Headway)	3 to 5.25 oz. at 10 to 28 days intervals	
	<i>Bacillus subtilis</i> Strain GB03 (Companion)	4.0 to 6 fl. oz. 14-28 day intervals	

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Fusarium/ Microdochium (cont.)	Chlorothalonil (Daconil Ultrex, Daconil Weatherstik, Daconil Zn, Daconil Action, Echo DF, Legend, Manicure, Evade, Pegasus DFX)	5 to 5.5 oz. at 21 to 28 days	Recent label changes by manufacturers restrict use on commercial turf only and not to be used on home lawns.
	Chlorothalonil + Propiconazole + Fludioxonil (Instrata)	5 to 11 fl. oz.	Late fall
	Chlorothalonil + Thiophanate methyl (Consys, Spectro, Peregrine, Tee-1-up WDG, TM + CTN SPC)	6 to 8 oz. one application 3.72 to 5.76 oz. at 7 to 14 days	
	Fenarimol (Rubigan AS 11.6)	Patch - 8 fl. oz. Apply 1 or 2 applications Blight - 2 fl. oz. at 30 day intervals	Use caution on bentgrass at high rate (See label). Irrigate with ½ to 1" of water following application.
	Fludioxonil (Medallion)	0.5 oz. one application	
	Fluoxastrobin (Disarm 480 SC, Disarm G)	0.18 to 0.36 fl. oz. at 14-28 day intervals 2.3 to 4.6 lb at 14 to 21 days	Begin applications when conditions are favorable for disease development, prior to disease development.
	Fluoxastrobin + Chlorothalonil (Disarm C)	3 to 5.9 oz. at 28 days	Begin applications when conditions are favorable for disease development, prior to disease development.
	Fluoxastrobin + Myclobutanil (Disarm M)	0.25 to 1.0 oz. at 14 to 28 days	Begin applications when conditions are favorable for disease development, prior to disease development.
	Flutolanil + thiophanate methyl (Systar)	4 to 6.12 oz. one application	
	Hydrogen dioxide (Zerotol, TerraCyte Pro)	2- to 12 fl. oz.	Treat in early fall to reduce the number of dormant spores. Treat throughout the winter
	Iprodione (Chipco 26GT; Chipco 26019, Iprodione Pro 2SE, Fungicide X, Raven, 18Plus, ArmorTech IP233, Iprodione SPC)	Blight - 8 fl. oz. repeat applications at 28 day intervals 1.5-2.0 oz. At 14-21 day intervals 3-4 fl. oz. at 14-28 day intervals	Use only preventative foliar applications when conditions first become favorable for disease development. Not for use in residential areas.
	Iprodione + thiophanate methyl (26/36, Dovetail, ArmorTech TMI 2020, TM + IP SPC)	2 to 4 oz. at 14 to 21 days	
	Iprodione + trifloxystrobin (Interface)	5 to 7 oz. at 14 to 21 day intervals	
	Mancozeb + Copper Hydroxide (Junction)	2-4 oz. at 7-14 day intervals	
	Metconazole (Tourney)	0.37 to 0.44 oz.	Late fall.
	Myclobutanil (Eagle 40WSP, ArmorTech Myclo 20EW)	0.6 to 2.4 oz. Myclo 20EW 1.2-2.4 oz	1 application
PCNB (Engage, Penstar, Revere, Terraclor, Turfcide)	8 oz. in 10 to 15 gal. water	Caution on Bentgrass for phytotoxicity.	
Polyoxin D (Endorse, Affirm)	4 oz. in a minimum of 2 gallons at 14 day intervals. 2.4 lbs/acre at 7-14 day intervals		

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Fusarium/ Microdo- chium (cont.)	Propiconazole (Banner Maxx, Banner GL, Savvi, Prophesy, Kestrel, Spectator, ArmorTech PPZ143MC, Strider, Propiconazole SPC 14.3)	2 to 4 oz.	
	Pyraclostrobin (Insignia, Insignia Intrinsic)	0.5 to 0.9 oz. at 14-28 day intervals	Use as preventative. Begin application when conditions are favorable for fungal infection; prior to disease symptom development.
	Pyraclostrobin + Boscalid (Honor, Honor Intrinsic)	0.55 to 1.1 oz. at 14 to 28 day intervals	
	Tebuconazole (Torque, ArmorTech TEB 360)	0.6 fl. oz.	Apply in the fall, before anticipated turf dormancy. If turf breaks dormancy during winter months a second application may be made
	Thiophanate Methyl (Cleary's, 3336, 3336 G, 3336 F, 3336 Plus, 3336 GC, 3336DG lite, T-Methyl SPC 4.5, T-Methyl SPC 50T-Methyl G, Fungo, Cavalier, Systec 1998, T-storm, Ar- morTech TM 462)	Patch - 2 oz. Repeat at 5 to 14 day intervals Blight - 4-8 oz. Apply 2 applications at 10-14 day intervals	Water into root zone after application.
	Thiram (Spotrete F)	3 to 12 oz.	
	Triadimefon (Bayleton 25WP) Granular turf fungicide, Systemic fungicide, Fungicide VII Bayleton 50, Bayleton Flo)	2 oz. on 15 day intervals or 4 oz. on 30 day intervals. Preventive. 1.5 lb at 15-30 day intervals Curative. 3 lb at 15-30 day intervals Syst. Fung. 0.5-1 oz. At 15-30 day intervals Bayleton 50 and Flo 1-2 oz	Apply first in mid-June or 30 days prior to time blight normally becomes evident. For golf and sod. Not to be used on residen- tial or commercial areas
	Trifloxystrobin (Compass)	Apply 0.2-0.25 oz. Fall-Early Spring	Apply when conditions are favorable for disease development.
	Trifloxystrobin + Triadimefon (Tartan, Armada)	2 oz. at 14 to 28 days 1.2 oz. at 14 to 28 days	Fall to Early Spring
	Triticonazole (Trinity, Triton)	0.5 to 1.0 fl. oz. 0.15 to 0.3 fl. oz.	
	Triticonazole + Chlorothalonil (Reserve)	3.2 to 4.5 oz. at 10 to 14 day intervals	
Vinclozolin (Curalan, Touche)	Patch - 2-4 oz. Repeat at 7-21 day intervals		
Gray Leaf Spot (Pyricu- laria)	Azoxystrobin (Heritage 50WG, TL, G)	0.2 to 0.4 oz. at 14 to 28 day intervals 2 to 4 lb at 14-28 days intervals	
	Azoxystrobin + Chlorothalonil (Renown)	2.5 to 4.5 fl. oz. at 10 to 14 day intervals	
	Azoxystrobin + Propiconazole (Headway)	1.5 to 3 oz. at 14 to 28 days intervals	
	<i>Bacillus subtilis</i> Strain QST713 (Rhapsody, Sonnet)	0.5 to 2.5 fl oz. at 7-10 day intervals	Apply in sufficient water to provide thorough coverage. 2 gal /1000 ft ² are commonly used.
	Chlorothalonil (Daconil 2787, Daconil Ultrex, Daconil Weather- stik, Daconil Zn, Daconil Action, Echo DF, Leg- end, Manicure, Evade, Pegasus DFX, ArmorTech CLT720, ArmorTech CLT825)	Flowable Preventive: 3-6 fl. oz. at 7-10 day intervals Curative: 6-11 fl. oz. at 7-10 day intervals Wettable Powder (WDG90) Preventive: 1.75-3.5 oz. at 7-10 day intervals Curative: 3.5-6.5 oz. at 7-10 day intervals	Recent label changes by manufacturers restrict use on commercial turf only and not to be used on home lawns.
	Chlorothalonil + Propiconazole (Concert, Concert II)	3 to 5.5 fl. oz. at 7 to 14 days 5.5 to 8.5 fl. oz. at 14 to 21 days	
	Chlorothalonil + Propiconazole + Fludioxonil (Instrata)	2.75 to 6 fl. oz. at 10 to 14 days	
	Chlorothalonil + Thiophanate methyl (Consyst, Spectro, Peregrine, Tee-1-up WDG, TM + CTN SPC)	2 to 8 oz. at 7 to 14 days 2 to 5.76 oz.	

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Gray Leaf Spot (Pyricularia) (cont.)	Fluoxastrobin (Disarm 480 SC, G)	0.18 to 0.36 fl. oz. at 14--28 day intervals 2.3 to 4.6 lb at 14 to 28 days	Begin applications when conditions are favorable for disease development, prior to disease development.
	Fluoxastrobin + Chlorothalonil (Disarm C)	3 to 5.9 oz. at 14 to 28 days	Begin applications when conditions are favorable for disease development
	Fluoxastrobin + Myclobutanil (Disarm M)	0.25 to 1.0 oz. at 14 to 28 days	Begin applications when conditions are favorable for disease development
	Flutolanil + thiophanate methyl (Systar)	2 to 3 oz. at 14 days	
	Myclobutanil (Eagle 40WSP, ArmorTech Myclo 20EW)	1.2 to 2.4 oz. Myclo 20EW 1.2-2.4	1 application
	Polyoxin D (Endorse, Affirm)	4 oz. in a minimum of 2 gallons at 14 day intervals. 2.4 lbs/acre at 7-14 day intervals	Do not irrigate for 12 hrs after application.
	Metconazole (Tourney)	0.37 oz. at 14-21 day intervals	Apply when conditions are favorable for disease development. Do not use on Bermudagrass.
	Mineral Oil (Civitas)	8 to 32 oz.	Use only in conjunction with Civitas Harmonizer
	Propiconazole (Banner Maxx, Banner GL, Savvi, Prophecy, Kestrel, Spectator, ArmorTech PPZ143MC Strider, Propiconazole SPC 14.3)	2 fl. oz. at 14 day intervals Banner GL individual packets; one packet treats 11,000-22,000 FT ²	
	Pyraclostrobin (Insignia, Insignia Intrinsic)	0.5 to 0.9 oz. at 14-28 day intervals	Use as preventative. Begin application when conditions are favorable for fungal infection; prior to disease symptom development.
	Pyraclostrobin + Boscalid (Honor, Honor Intrinsic)	0.55 to 1.1 oz. at 14 to 28 day intervals	
	Tebuconazole (Torque, ArmorTech TEB360)	0.6 fl. oz.	Apply when conditions are favorable for disease development at 28 days intervals
	Thiophanate Methyl (Cleary's, 3336, 3336 G, 3336 F, 3336 Plus, 3336 GC, 3336DG lite, T-Methyl SPC 4.5, T-Methyl SPC 50T-Methyl G, Fungo, Cavalier, Systec 1998, T-storm, ArmorTech TM 462)	Preventive: 1 oz. /5 gal. water. Apply 10-14 days as needed Curative: Apply 2 oz./5 gal. water	
	Triadimefon (Bayleton 25WP, Granular turf fungicide, Systemic fungicide, Fungicide VII Bayleton 50, Bayleton Flo)	Preventive. 1.5 lb at 15-30 day intervals Curative. 3 lb at 15-30 day intervals Syst. Fung. 0.5-1 oz. At 15-30 day intervals Bayleton 50 and Flo 0.5-1 oz	For golf and sod. Not to be used on residential or commercial areas
	Trifloxystrobin (Compass)	Apply 0.15-0.2 oz. in 1-2 gals. water at 14 day intervals or 0.25 oz. in 1-2 gals. water at 21 day intervals.	Apply when conditions are favorable for disease development.
	Trifloxystrobin + Triadimefon (Tartan, Armada)	1 to 2 oz. at 14 to 28 days 0.6 to 1.2 oz. at 14 to 28 days	
Triticonazole + Chlorothalonil (Reserve)	3.2 to 4.5 oz. at 14 to 28 day intervals		
Helminthosporium, Curvularia, Leaf Spots, Rusts, Anthracnose	Azoxystrobin (Heritage 50WG, TL, G)	0.2-0.4 oz. Apply on a 14-28 day intervals 2 to 4 lb at 14-28 days intervals	
	Azoxystrobin + Chlorothalonil (Renown)	2.5 to 4.5 fl. oz. at 7 to 10 day intervals	
	Azoxystrobin + Propiconazole (Headway)	0.75-3 oz. at 14 to 28 days intervals	
	<i>Bacillus licheniformis</i> (EcoGuard SB 3086)	Up to 20 oz. at 3-14 days intervals	
	<i>Bacillus subtilis</i> Strain QST713 (Rhapsody, Sonnet)	2.0 to 10 fl. oz. at 7-10 day intervals	Apply in sufficient water to provide thorough coverage. 2 gal /1000 ft ² are commonly used.

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Helminthosporium, Curvularia, Leaf Spots, Rusts, Anthracnose (cont.)	<i>Bacillus subtilis</i> Strain GB03 (Companion)	4.0 to 6 fl. oz. 14-28 day intervals	
	Chlorothalonil (Daconil Ultrex, Daconil Weatherstik, Daconil Zn, Daconil Action, Echo DF, Legend, Manicure, Evade, Pegasus DFX, ArmorTech CLT720, ArmorTech CLT825)	Flowable Preventive: 3-6 fl. oz. at 7-10 day intervals Curative: 6-11 fl. oz. at 7-10 day intervals Wettable Powder (WDG90) Preventive: 1.75-3.5 oz. at 7-10 day intervals Curative: 3.5-6.5 oz. at 7-10 day intervals	Recent label changes by manufacturers restrict use on commercial turf only and not to be used on home lawns.
	Chlorothalonil + Propiconazole (Concert, Concert II)	3 to 5.5 fl. oz. at 14 to 21 days 5.5 to 8.5 fl. oz. at 14 to 28 days	
	Chlorothalonil + Propiconazole + Fludioxonil (Instrata)	2.75 to 6 fl. oz. at 10 to 21 days	
	Chlorothalonil + Thiophanate methyl (Consyst, Spectro, Peregrine, Tee-1-up WDG, TM + CTN SPC)	2 to 8 oz. at 7 to 21 days 2 to 5.76 oz. at 7 to 14 days	
	Fludioxonil (Medallion)	0.2 to 0.5 oz. at 14 to 21 day intervals	Apply when conditions are favorable for disease development.
	Fluoxastrobin (Disarm 480 SC, G)	0.18 to 0.36 fl. oz. at 14-28 day intervals 2.3 to 4.6 lb at 14 to 28 days	Begin applications when conditions are favorable for disease development, prior to disease development.
	Fluoxastrobin + Chlorothalonil (Disarm C)	3 to 5.9 oz. at 14 to 28 days	Begin applications when conditions are favorable for disease development, prior to disease development.
	Fluoxastrobin + Myclobutanil (Disarm M)	0.25 to 1.0 oz. at 14 to 28 days	Begin applications when conditions are favorable for disease development, prior to disease development.
	Flutolanil + thiophanate methyl (Systar)	2 to 3 oz. at 14 days	
	Hydrogen dioxide (Zerotol, TerraCyte Pro)	6-25 oz.	Curative control may require 2-3 consecutive applications. Use on 5-10 gal per 1000 ft ²
	Iprodione (Chipco 26GT, Chipco 26019, Iprodione Pro 2SE, Fungicide X, Raven, 18Plus, ArmorTech IP233, Iprodione SPC)	2-4 fl. oz. in 2-10 gals. water Apply every 14-21 days. 2 oz. = 12 Tbs. 1.5-2.0 oz. at 14-21 day intervals 3-4 fl. oz. at 14-28 day intervals	Not for use in residential areas.
	Iprodione + thiophanate methyl (26/36, Dovetail, ArmorTech TMI 2020, TM + IP SPC)	2 to 4 oz. at 14 to 21 days	
	Iprodione + trifloxystrobin (Interface)	5 to 7 oz. at 14 to 21 day intervals	Anthracnose suppression only
	Mancozeb + Copper Hydroxide (Junction)	2-4 oz. at 5 day intervals	
	Maneb, Maneb + zinc sulfate & Mancozeb (Fore, Protect T/O)		
	Myclobutanil (Eagle WSP 40, Golden Eagle, ArmorTech Myclo 20EW)	Preventive: 0.6 oz. at 14 day intervals (3 oz. pkt./5000 ft ²)	Do not graze treated areas or feed clippings to livestock
	Metconazole (Tourney)	0.28 to 0.37 oz. at 14-21 day intervals	Apply when conditions are favorable for disease development. Do not use on Bermudagrass.
Mineral Oil (Civitas)	8 to 32 oz.	Use only in conjunction with Civitas Harmonizer	

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Helminthosporium, Curvularia, Leaf Spots, Rusts, Anthracnose (cont.)	PCNB (Engage, Penstar, Revere, Terraclor, Turfcide)	7-10 oz. in 5 to 10 gal. water at 3-4 weeks.	
	Phosphorous acid (Fosphite)	2 to 3 fl. oz.	Use only as preventative treatment or when conditions are favorable for disease development
	Polyoxin D (Endorse, Affirm)	4 oz. in a minimum of 2 gallons at 14 day intervals. 2.4 lbs/acre at 7-14 day intervals	Do not irrigate for 12 hrs after application.
	Propiconazole (Banner Maxx, Banner GL, Savvi, Prophesy, Kestrel, Spectator, ArmorTech PPZ143MC Strider, Propiconazole SPC 14.3)	1-2 fl. oz. 14-28 Banner GL individual packets; one packet treats 11,000-22,000 ft ²	If anthracnose is present use 2 oz. rate in combination with Daconil or Chipco 26GT. Do not mow or irrigate treated areas until grass is completely dry. Do not use on home lawns. Bermudagrass and St. Augustinegrass can be sensitive to Banner. Do not exceed 2 fl. oz./1000 ft ² every 30 days on any variety of Bermudagrass or St. Augustine grass. On Bentgrass, do not exceed 1 oz./1000 ft ² or apply at less than 21 day intervals when temperatures exceed 80°F.
	Pyraclostrobin (Insignia, Insignia Intrinsic)	0.5 to 0.9 oz. at 14-28 day intervals	Use as preventative. Begin application when conditions are favorable for fungal infection; prior to disease symptom development.
	Pyraclostrobin + Boscalid (Honor, Honor Intrinsic)	0.55 to 1.1 oz. at 14 to 28 day intervals	
	Tebuconazole (Torque, ArmorTech TEB360)	0.6 fl. oz.	For prevention, begin applications when conditions are favorable for disease development. Do not make two consecutive applications of Torque fungicide. Alternate with another fungicide with different mode of action. A second application may be made after 28 days
	Thiophanate Methyl (Cleary's, 3336, 3336 G, 3336 F, 3336 Plus, 3336 GC, 3336DG lite, T-Methyl SPC 4.5, T-Methyl SPC 50T-Methyl G, Fungo, Cavalier, Systec 1998, T-storm, ArmorTech TM462)	Preventive: 1 oz. /5 gal. water (Anthracnose). Apply 10-14 days as needed Curative: Apply 2 oz./5 gal. water	
	Thiophanate methyl + Iprodione	1.1 to 2.1 oz. at 7 to 14 days	
	Thiram (Spotrete F)	Preventative: 3 ¼ fl. oz. at 7-10 day intervals Curative: 7 ½ fl. oz. at 3-5 day intervals	For best results use spray mix the same day it is prepared. Spray right after mowing or avoid mowing 12 hrs after application.
	Trifloxystrobin (Compass)	Preventive: Apply 0.1-0.15 oz. at 14 day intervals Curative: Leaf spot - 0.15-0.25 oz. in 1-2 gals. water at 21-28 day intervals Rust - 0.2-0.25 oz. in 1-2 gals. water at 21 day intervals Preventive: Anthracnose - 0.15-0.2 oz. at 14 day intervals in 1-2 gals. water Curative: 0.25 oz. at 21 day intervals in 1-2 gals. water	Apply when conditions are favorable for disease.
	Triadimefon (Bayleton 50, Bayleton Flo)	1.0 oz or fl oz	For Anthracnose: Preventative rate: Apply at 30-day intervals and repeat as necessary for seasonal control. Depending on environmental conditions, residual control may be extended to 45 days. Curative rate: To control existing infections. Subsequent applications should be applied on a preventative schedule and rate. For golf and sod. Not to be used on residential or commercial areas
	Trifloxystrobin + Triadimefon (Tartan, Armada)	1 to 2 oz. at 14 to 28 days 0.6 to 1.2 oz. at 14 to 28 days	
	Triticonazole (Trinity, Triton)	0.5 to 1.0 fl. oz. at 14-28 day intervals	
Triticonazole + Chlorothalonil (Reserve)	3.2 to 4.5 oz. at 14 to 28 day intervals		
Vinclozolin (Curalan, Touche)	1-2 oz. (Helminthosporium) at 14-28 day intervals		

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Pythium Blight, Pythium Root Rots, Pythium Root Dysfunction	Azoxystrobin (Heritage 50WG, TL, G)	0.4 oz. on 10-14 day intervals 2 to 4 lb at 10-14 days intervals	
	Azoxystrobin + propiconazole (Headway)	3 oz. at 10 to 14 days intervals	
	<i>Bacillus subtilis</i> Strain GB03 (Companion)	4.0 to 6 fl. oz. 14-28 day intervals	
	Chloroneb (Termec SP, Terraneb)	4 oz. in 3-5 gals. water 4 oz. = 12.5 Tbs.	
	Cyazofamid (Segway)	0.45-0.9 fl. oz. at 14-21 day intervals	Apply as a preventative treatment at 0.45 to 0.9 fl. oz. in 2 to 4 gals. of water. On established turf apply as a preventative treatment when conditions are favorable for disease development. During periods of prolonged favorable conditions use 0.45 fl. oz. on a 14 day interval, using another fungicide having a different mode of action between applications of Segway. For newly seeded areas use 0.45 fl. oz. in 2-4 gals. water immediately after seeding.
	Etridiazole (Koban 30WP, Terrazole)	Established Turf: 2-4.5 oz. in 5 gals. water Newly Seeded Areas: 7-9 oz. in 5 gals. water. 4 oz. = 9.5 Tbs. Terrazole=2-4.5 oz. At 10-14 day intervals	Retreat in 5-10 days depending on weather conditions. Can cause phytotoxicity on cool season turfs in hot weather at low carrier volumes.
	Fosetyl AL (Alliette 80WP, Chipco Signature, Prodigy Signature, Autograph, ArmorTech ALT 70)	4-8 oz. in 1-5 gal. water per 1000 ft ² at 14-21 day intervals. Begin preventive applications when conditions first favor disease and repeat as recommended 4-8 oz 14-21 day intervals ALT70 4.6-9.2 oz	Do not mow and/or water treated areas until foliage is completely dry
	Fluoxastrobin (Disarm 480 SC)	0.18 to 0.36 fl. oz. at 14 day intervals	Begin applications when conditions are favorable for disease development, prior to disease development. When conditions are conducive for heavy Pythium infections use Disarm in combination with another product labeled for Pythium control.
	Fluoxastrobin + Chlorothalonil (Disarm C)	3 to 5.9 oz. at 7 to 14 days	
	Fluoxastrobin + Myclobutanil (Disarm M)	0.25 to 1.0 oz. at 14 days	Use preventatively
	Mefenoxam (Subdue, Subdue Maxx, Subdue G)	Established Turf: 2X WSP: 5-25 oz. Maxx: 0.5-1 fl. oz. in 1-5 gals of water Newly Seeded Areas: 2X WSP: 0.11-0.56 oz. in 1-5 gals of water Maxx: 0.5-1 fl. oz. in 1-5 gals of water	Retreat at 10-14 day intervals depending on disease pressure and weather conditions. Apply immediately after seeding and irrigate with ¼ to ½" water. Repeat application at 7-14 day intervals if conditions remain favorable for disease.
	Mancozeb + Copper Hydroxide (Junction)	2-4 oz. At 5 day intervals	
	Phosphorous acid (Alude, Fosphite)	5 to 10 fl. oz. at 7-14 day intervals Fosphite= 2 to 3 fl. oz.	Apply recommended quantity of product in 1 to 5 gals. of water. Do not irrigate or mow treated areas until spray has completely dried.
	Phosphate (Magellan, Phostrol, Vital)	4.1 fl. oz. at 14 days 8.2 fl. oz. at 21 days	Do not irrigate or mow treated areas until spray has completely dried. Begin preventative applications when conditions first favor disease.
Propamocarb (Banol)	Preventative: 1.25-2 fl. oz. in 2-5 gals. water Curative: 3-4 fl. oz. in 2-5 gals. water	Established Turf: Apply as a preventative treatment during periods of high temperature and humidity. Overseeded Areas: Apply after germination. Repeat at 7-21 day intervals if favorable disease conditions persist.	

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS /1000 ft ²)	REMARKS
Pythium Blight, Pythium Root Rots, Pythium Root Dysfunction (cont.)	Propamocarb + Fluopicolide (Stellar)	1.2 fl. oz.	The maximum Stellar application rate is 2.4 oz. per year per 1000 ft ² . Overseeded Turf: Apply after seed germination to prevent Pythium damping off. Established Turf: Apply when conditions are favorable for disease development.
	Pyraclostrobin (Insignia, Insignia Intrinsic)	0.5 to 0.9 oz. at 14-28 day intervals	Use as preventative. Begin application when conditions are favorable for fungal infection; prior to disease symptom development.
	Pyraclostrobin + Boscalid (Honor, Honor Intrinsic)	Dysfunction= 1.1 oz. at 14 to 28 day intervals Blight= 1.1 oz. at 10 to 14 day intervals	
Spring Dead Spot (<i>Ophiosphaerella korrae</i> , <i>Ophiosphaerella narmari</i> , <i>Ophiosphaerella herpotricha</i>)	Azoxystrobin (Heritage 50 WG, TL)	0.4 oz. at 28 day intervals	Make 1 or 2 applications in fall or when conditions are favorable for disease development.
	Azoxystrobin + propiconazole (Headway)	3 oz. at 14 to 28 days intervals	
	Fenarimol (Rubigan A.S.)	4 oz. in September or 6 oz. in October or November and irrigated with ½ to 1" of water	
	Fluoxastrobin (Disarm 480 SC, G)	0.36 fl. oz. at 28 day intervals 2.3 to 4.6 lb at 14 to 28 days	Begin applications before disease is present and continue applications while conditions for disease development are present. Make two applications 28 days apart during spring or fall.
	Fluoxastrobin + Chlorothalonil (Disarm C)	5.9 oz. at 14 to 28 days	
	Fluoxastrobin + Myclobutanil (Disarm M)	0.5 to 1.0 oz. at 14 to 28 days	Apply 1 or 2 applications approximately one month prior to Bermudagrass dormancy. ¼ to ½ inch of irrigation after application is recommended. Re-apply 14 to 28 days later
	Myclobutanil (Eagle WSP 40, Golden Eagle, ArmorTech Myclo 20EW)	2.4 fl oz at 28 days	Make 1 to 2 applications in the fall before turfgrass dormancy. Make a second application one month later.
	Propiconazole (Banner Maxx, Banner GL, Savvi, Prophesy, Kestrel, Spectator, ArmorTech PPZ143MC Strider, Propiconazole SPC 14.3)	4 oz. at 30 day intervals. Banner GL individual packets; one packet treats 11,000-22,000 ft ²	Make 1-3 applications. For one application apply in September or October. For multiple applications, begin sprays in August.
	Tebuconazole (Torque, ArmorTech TEB360)	0.6 fl oz.	For prevention, apply in fall when soil temperatures reach 65°F and again in spring under similar temperature conditions or after dormancy break
	Thiophanate Methyl (Cleary's, 3336, 3336F, 3336G, 3336 GC, 3336DG lite, T-Methyl SPC 4.5, T-Methyl SPC 50T-Methyl G, Fungo, Cavalier, Systec 1998, ArmorTech TM 462)	4 to 6 oz. at 14 day intervals TM 462 3.5-5.3 oz	
Take all patch/root rot (<i>Gaeumannomyces graminis</i>) Bermuda Decline (see fungicide labels for specific <i>Gaeumannomyces</i> species/diseases)	Azoxystrobin (Heritage 50 WG, G)	0.4 oz. at 28 day intervals 2 to 4 lb at 28 days intervals	Make 1 or 2 applications in fall or when conditions are favorable for disease development.
	Azoxystrobin + propiconazole (Headway)	3 oz. at 14 to 28 days intervals	
	Fenarimol (Rubigan A.S.)**	4 oz. in September or 6 oz. in October or November and irrigated with ½ to 1" of water	
	Fluoxastrobin (Disarm 480 SC, G)	0.36 fl. oz. at 14 day intervals	Apply 1-2 applications approximately one month before turfgrass dormancy. ¼ to ½" of direct irrigation is recommended after application.
	Fluoxastrobin + Chlorothalonil (Disarm C)	5.9 oz. at 28 days	
	Fluoxastrobin + Myclobutanil (Disarm M)	0.5 to 1.0 oz. at 28 days	

TURF DISEASE CONTROL (continued)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Take all patch/ root rot <i>(Gaeumannomyces graminis)</i> Bermuda Decline (see fungicide labels for specific <i>Gaeumannomyces</i> species/diseases) (cont.)	Myclobutanil (Eagle 40WSP)	1.2 to 2.4 oz. at 28 day intervals (spring and fall)	
	Propiconazole (Banner Maxx, Banner GL, Savvi, Prophesy, Kestrel, Spectator, ArmorTech PPZ 143MC, Strider, Propiconazole SPC 14.3)	4 oz. at 30 day intervals. Banner GL individual packets; one packet treats 11,000-22,000 ft ²	Make 1-3 applications. For one application apply in September or October. For multiple applications, begin sprays in August.
	Pyraclostrobin (Insignia, Insignia Intrinsic)	0.5 to 0.9 oz. at 14-28 day intervals	Use as preventative. Begin application when conditions are favorable for fungal infection; prior to disease symptom development.
	Pyraclostrobin + Boscalid (Honor, Honor Intrinsic)	Bermudagrass decline 1.1 oz. Take all patch =1.1 oz. at 28 day interval	For Bermudagrass decline= Make one application in the spring following green-up and a second application in the fall when air temperatures remain above 80°F and humidity is 75% or higher. Apply in 4 gallons of water per 1000 sq ft
	Tebuconazole (Torque, ArmorTech TEB360)	0.6 fl oz.	For Bermudagrass decline= irrigate the area with sufficient water to move fungicide into crown and root zone of the turf. Take all patch= For prevention, apply in fall when soil temperatures reach 65°F and again in spring under similar temperature conditions.
	Thiophanate Methyl (Cleary's, 3336, 3336 F, 3336 Plus, 3336 G, 3336 GC, 3336DG lite, T-Methyl SPC 4.5, T-Methyl SPC 50T-Methyl G, Fungo, Cavalier, Systec 1998)	4 to 6 oz. at 14 day intervals	
	Triadimefon (Bayleton 25WP, Granular turf fungicide, Systemic fungicide, Bayleton 50, Bayleton Flo)	Preventative = 2 oz. start sprays 2 to 4 weeks before symptoms reappear. Re-apply every 3-4 weeks Curative = 4 oz. make 1-2 sprays on a 2-3 week interval followed by the preventative rate at 3-4 week interval	Apply 2 to 4 gallons of spray volume per 1,000 ft ² . Thoroughly water after each application. 50 and Flo; Immediately after the fungicide is applied, the area should be thoroughly irrigated to move the active ingredient down into the crown and root zone of the turf. The amount of water is dependent on the depth of the root zone. The objective is to water the fungicide into the crown and root zone. For golf and sod. Not to be used on residential or commercial areas.
	Triticonazole (Trinity, Triton)	0.5 to 1.0 fl. oz. at 14-28 day intervals.	Make 1 or 2 fall applications (September and October) and 1 or 2 spring applications (April and May) depending on local conditions.
Triticonazole + Chlorothalonil (Reserve)	Take-all Patch= 3.2 to 4.5 oz. at 14 to 28 day intervals	Begin fungicide applications preventatively in the fall and repeat in the following spring. Make 1 to 2 applications depending on local disease conditions, repeat under active disease conditions as needed.	

FUNGICIDES SOLD AS PRE-PACKED MIXTURES

ACTIVE INGREDIENTS	PRODUCT NAMES
azoxystrobin + propiconazole	Headway
azoxystrobin + chlorothalonil	Renown
copper sulfate + mancozeb	Junction
chlorothalonil + propiconazole	Concert, Concert II
chlorothalonil + fludioxonil + propiconazole	Instrata
chlorothalonil + acibenzolar-S-methyl	Daconil Action
fenarimol + chlorothalonil	Lesco twosome
fluoxastrobin + chlorothalonil	Disarm C
fluoxastrobin + miclobutanil	Disarm M
iprodione + thiophanate methyl	26/36 Fungicide, Dovetail, ArmorTech TMI 2020, TM + IP SPC
iprodione + trifloxystrobin	Interface
miclobutanil + mancozeb	MANhandle
Pyraclostrobin + Boscalid	Honor, Honor Intrinsic
thiophanate methyl + chlorothalonil	ConSyst, Spectro, Broadcide, Peregrine, Tee-1-up WDG, TM + CTN SPC
thiophanate methyl + flutolanil	Systar
thiophanate methyl + mancozeb	Duosan
thiophanate methyl + thiram	Bromosan
triadimefon + flutolanil	Prostar plus
triadimefon + trifloxystrobin	Armada, Tartan
triticonazole + chlorothalonil	Reserve

See labels for rates and specific recommendations

MAJOR CHEMICAL GROUPS OF TURFGRASS FUNGICIDES

Chemical Family	Common Name	Trade Name	Type/Mode of Action
Aromatic Hydrocarbons	Chloroneb	Anderson's Fungicide V 6.25G Anderson's Turf Fungicide 7.5G Termec SP, Terraneb SP	Protectant Fungicide Mode of action: Interferes with mitosis
	Etridiazol	Koban 30WP, Terrazole	
	PCNB	Anderson's 10-0-14 Fertilizer + 15% PCNB, Anderson's FFII 15 .4G (14-3-3), Cleary's PCNB, Engage 75W, Engage 10GF, FF II, Lesco Revere 4000 4F, Lesco Revere 10G, Parflo 4F, Penstar 75WP, Penstar 15G, Penstar 4F, Revere 10G, Revere 4000, Flowable Turf, Terraclor 75%WP, Terraclor 75%WP (T&O), Turfcide 400F, Turfcide 10G	
Benzimidazoles	Thiophanate methyl	Anderson's Systemic Fungicide 2.3G, Cava- lier, Cleary's 3336 50W/WSP, Cleary's 3336 2G, Cleary's 3336 4.5F, 3336 GC, 3336DG lite, T-Methyl SPC 4.5, T-Methyl SPC 50T- Methyl G, Fungo Flo AGC, Fungo 4.5F, Fungo Flo 50WSB, Lesco T-Storm (50WSP & Flowable), OHP 6672 (4.5L & 50W), Scott's Lawn Fungus Control, Systec 1998 85WDG, Armortech TM 462	Acropetal penetrant Mode of action: Fungicide binds tubulin subunits that results in mitotic arrest
Carboximides	Flutalonil	Prostar	Acropetal penetrant fungicide Basidiomycete control Mode of action: Blocks activity of certain respiratory enzymes
Demethylation Inhibitors (DMI's)	Fenarimol	Rubigan	Broad spectrum acropetal penetrant fungicide Mode of action: Sterol inhibitor (ergosterol). Inhibits cell mem- brane synthesis
	Myclobutanil	Eagle, ArmorTech Myclo 20 EW	
	Propiconazole	Banner Maxx 1.24 MEC, Banner GL 3.6WSP, Lesco Spectator 3.6EC, 1.3MEC; Quali-pro propiconazole 14.3, ProPensity 1.3 ME, Ar- morTech PPZ143MC, Strider, Propiconazole SPC 14.3	
	Triadimefon	Accost 1G, Anderson's Fungicide VII 0.59G, Anderson's 1% Bayleton 1G, Bayleton 25WP, Bayleton 50WSP, Bayleton Flo, Lebanon Bayleton 1G, Lesco Granular turf fungicide 1G, Lesco Systemic fungicide contains 50% Bayleton, Pro Bayleton, Strike 25 WP, Tee- Off 4.5 F	
	Triticonazole	Trinity, Triton	
	Tebuconazole	Torque, ArmorTech TEB360	
Dicarboximides	Iprodione	Chipco 26GT, Chipco 26019, Iprodione Pro 2SE, ArmorTech IP233, Iprodione SPC	Localized Penetrant Mode of action: Affects DNA synthesis and lipid metabolism
	Vinclozolin	Curalan, Touche	
Carbamates and Dithiocabamates	Mancozeb	Dithane 45C Rainshield, Dithane 75DF Rainshield, Dithane DF, Dithane DF Rain- shield, Dithane F-45 Rainshield, Dithane M-45, Dithane WF Rainshield, Dithane T/O Rainshield 75WP, Dithane 37WF, Flowable Mancozeb 4, Fore, Fore Flo-XL 4F, Fore 80WP Rainshield, Formex 80W, Lesco Man- cozeb 75DG, Lesco 4 Flowable Mancozeb 4F, Mancozeb + Copper, Mancozeb DG, Manzate 80WP, Manhandle, ManKocide, Manzate 75DF, Manzate Flowable Protect T/O	Protectant fungicide Mode of action: Enzyme inactivation
	Propamocarb hydrochloride	Banol, Proplant	Localized penetrant Mode of action: Alters cell membrane function

MAJOR CHEMICAL GROUPS OF TURFGRASS FUNGICIDES (continued)			
Chemical Family	Common Name	Trade Name	Type/Mode of Action
Nitriles	Chlorothalonil	Anderson's 5% ChloroStar 6F, 82.5WDG, CountDown, ArmorTech CLT720, ArmorTech CLT 825, Daconil 5G, Daconil Ultrex, Daconil Weatherstik, Daconil Zn, Daconil Action, Echo DF, Echo 500, Legend, Manicure, Evade, 75WDG, Lebanon Daconil 5G, Lescó Manicure T/O, 6F, ThaloniL, Ultrex 82.5WDG, Pegasus DFX	Protectant Fungicide Mode of action: Toxic to cell membrane
Phenylamides	Mefenoxam	Anderson's Pythium Control 1.2G, Apron XL LS, Mefanoxam 2, Quell, Ridomil Gold EC, Subdue GR, Subdue Maxx, Subdue WSP, Tri-Power Selective	Acropetal penetrant fungicide Mode of action: Inhibits RNA synthesis
Phenylpyrrole	Fludioxonil	Medallion	Protectant Fungicide Mode of action: Cell membrane toxicity, amino acids uptake inhibition
Phosphonates	Fosetyl-Al	Aliette 80WP, Aliette WDG, Chipco Signature, ArmorTech ALT70, Prodigy Signature, Lescó Prodigy Signature 80DG, Terra Aliette T/O, 80WDG	Systemic fungicide Mode of action: General fungitoxic effect
	Potassium Phosphonate	Alude Magellan, Phostrol, Vital	
Strobilurins	Azoxystrobin	Heritage	Broad spectrum, systemic Broad spectrum, systemic Broad spectrum, localized penetrant Mode of action: ATP inhibition
	Flouxastrobin	Disarm, Disarm GR, Disarm C, Disarm M	
	Trifloxystrobin	Compass	
	Pyraclastrobin	Insignia, Insignia Intrinsic	
Antibiotic	Polyoxin D	Endorse, Affirm	Localized penetrant fungicide Mode of action: Inhibits chitin production, which is a major component of the cell wall in many fungi; Inhibits spore germination

BIOFUNGICIDES

Biofungicides are naturally based microbial or biochemical products. There are two types of biopesticides: (1) Microbial biopesticides with an active ingredient that is a biological control agent (organism capable of attacking or competing with a pathogen or pest), and (2) plant biopesticides or plant-incorporated protectants are "pesticidal substances that plants produce from genetic material that has been added to the plant."

TURF DISEASE CONTROL (continued)			
Trade Name	Active Ingredients	RATES (OZS./1000 ft ²)	Company
Companion	<i>Bacillus subtilis</i> Strain GB03	4.0 to 6 fl. oz.	Growth Products
EcoGuard SB 3086	<i>Bacillus licheniformis</i>	Up to 20 oz.	Novozymes
Rhapsody Strain QST713 Sonnet Strain QST713	<i>Bacillus subtilis</i>	2.0 to 10 fl. oz. 0.5-2.5 oz	Agraquest ArmorTech

ADDITIONAL NOTES ON TURFGRASS FUNGICIDES

Protectant and Systemic Fungicides

There are two general types of fungicides: protectants and systemics. Protectant fungicides (sometimes called contacts), remain on the plant surfaces after application and do not penetrate the plant tissue. Systemic fungicides are absorbed into the plant and move within the plant tissue. Some fungicides are locally systemic and move only a limited distance within the plant. The dicarboximide fungicides are good examples of this group. Some systemics are moderately systemic, such as the DMI fungicides, whereas others are highly systemic and move readily through the plant's vascular transport system (e.g., the phosphonates). Examples of highly mobile systemics include the benzimidazoles. Most systemic fungicides only move upward in plant tissues. Only one systemic fungicide (fosetyl-AI) moves bidirectionally (from leaves to roots and vice versa). Systemic fungicides sometimes can suppress the fungus after it has infected the plant, whereas protectant fungicides must be present on the plant surfaces before infection begins to be effective.

Formulation

Several fungicidal products are available in more than one formulation. For protectant fungicides, a sprayable formulation (wettable powder, flowable, dry flowable, water dispersible granule, emulsifiable concentrate) usually provides better disease control than a granular formulation. Sprayable formulations can be superior to granular formulations even for systemics that are not highly mobile in plant tissues. Spray equipment allows more thorough coverage of plant surfaces than does a granular spreader. More thorough coverage can result in better control of fungi infecting foliage. If fungicide sprays are applied to control a root disease, it is often advisable to lightly irrigate before the fungicide dries to wash it into the root zone. Likewise, if granular fungicides are applied to control root diseases, apply to dry turf and irrigate after application.

Fungicide Mixtures

Several products formulated for turf disease control are prepackaged mixtures containing two or more active ingredients. Mixtures provide some protection against fungicide resistance and typically provide a broader spectrum of activity against turfgrass diseases. Prepackaged mixtures offer convenience and assurance against incompatibility, whereas tank-mixing on site offers greater flexibility in fungicide choice and application rates.

Fungicide Resistance

Infectious fungi sometimes develop resistance to particular fungicides, especially when a product is used repeatedly without alternating with chemically unrelated fungicides. When fungicide resistance develops, there is no value in increasing rates, shortening intervals between sprays, or using other fungicides with similar modes of action. Fungicide resistance has been confirmed in numerous instances for each of the following diseases and fungicide groups: dollar spot against benzimidazole fungicides and DMI fungicides (e.g. Bayleton etc), gray leaf spot against strobilurin (QoI) fungicides (e.g. Heritage, Compass etc), and Pythium blight against phenylamide fungicides (Subdue etc). Benzimidazoles (e.g., Cleary 3336) and phenylamides (e.g., Subdue MAXX) have the highest risk of resistance. Strobilurins (e.g., Heritage) have a moderately high risk of resistance, DMIs (e.g., Bayleton) and the dicarboximides (e.g., Chipco 26GT) have a moderate risk, and the nitriles (e.g., Daconil), aromatic hydrocarbons (e.g., PCNB), and dithiocarbamates (e.g., mancozeb) have a low risk of resistance. Several general strategies are recommended to minimize the risk of fungicide resistance. First, don't rely on fungicides alone for disease control. Avoid using turfgrass varieties that are highly susceptible to common diseases. Follow good disease management practices to reduce the possibility of fungicide resistance. Limit the number of times at-risk fungicides are used during a growing season. Alternate at-risk fungicides with different fungicide groups. When using an at-risk fungicide, tank-mixing it with another fungicide from another chemical group (different mode of action) can also reduce the risk of resistance. These are general principles that can help to reduce but not eliminate risk. A fungicide-resistant pathogen population can still develop when these principles are practiced. Refer to product labels before tank-mixing products to ensure compatibility and to avoid phytotoxicity. For major chemical groups description, see "Major Chemical Groups" section located at the end of this handbook.

Chlorothalonil Restrictions on Residential (Home) Lawns

As a result of the Food Quality Protection Act of 1996, the EPA has decided to curtail the use of fungicides containing chlorothalonil and iprodione on residential turf.

Chlorothalonil Restrictions on Golf Courses

As of 2001, the following restrictions are in effect for the use of chlorothalonil on golf courses:

Seasonal maximum:

-73 lb ai/A/season on greens -52 lb ai A/season on tees

-26 lb ai/A/season on fairways.

Maximum single application rate: 7.3 lb ai/A

Minimum spray intervals: 7 days

Methods to maximize efficacy of turfgrass fungicides

- All fungicides are not equally effective on all diseases. Proper selection is very important on disease management.
- Read the label directions carefully before applying fungicide.
- Apply fungicides at the rate specified in the label.
- Use compatible tank mixes at recommended label rates.
- The best control is achieved by applying fungicides preventatively.
- Fungicides should be sprayed when air temperatures are between 60°F and 85°F (15.3°C and 29.4°C).
- Avoid turfgrass stress (drought or temperature) before or at the time of application.
- Use proper sprayer to deliver appropriate coverage.
- Fungicides should stay on the foliage for at least 6 h for most effective control.
- Some fungicides have to be watered-in for proper place of action.
- Do not apply fungicides if rain is expected within 3-4 h (ideally 12 h after application).
- Delay mowing as much as possible to give the fungicide a chance to work (should follow the one-third rule).
- Use enough water when applying fungicide (usually 2 gallons/1000 ft² will give adequate coverage).
- Water pH for dilution or mix should be between 6-7.
- Do not apply fungicides when conditions are windy. Wind velocity tends to be the lowest early in the morning and late in the afternoon.
- When using granular materials, best results are obtained if soil is moist.
- Keep traffic off the area at least 2-3 hours after application.
- Be patient if an application appears to have produced no results. Some fungicide applications results can be seen months later.

** Gowan Company announced will cease Rubigan (fenarimol) sales on Dec 31, 2012

NEMATODE CONTROL IN TURFGRASS

Alfredo Martinez, Extension Plant Pathologist and Clint Waltz, Turfgrass Specialist
(Commercial Turf Only)

DISEASE	PESTICIDE	RATES (OZS./1000 ft ²)	REMARKS
Nematodes	Curfew	3 to 5 gallons / acre	Restricted Use Pesticide. Liquid soil fumigant placed in the soil a minimum of 5" deep by approved applicators. Apply 0.25 to 0.5" of water immediately after application. This product has a 24 hour reentry restriction and can not be applied within 100 ft. of an occupied structure. Not for use on turfgrass being grown for sale or other commercial uses as sod or seed production.
	***Nemacur 10G	2 1/3 lb/1000 ft ² (100 lb/acre)	Apply uniformly. Immediately apply ½" water. DO NOT USE ON NEWLY SEEDED AREAS.
	***Nemacur 3 Turf	9.7 fl. oz. or 3.3 gal/acre	For use on golf courses and sod farms. Immediately apply ½ inch water. Sod should not be cut or handled for 30 days after treatment.
	Nortica (<i>Bacillus firmus</i> strain I-1582)	0.7-2.3 lbs (10-30 oz)	Make applications every 3 months as necessary and irrigate to a depth of 4 in.
	Telone II	5 to 10 gallons / acre	Restricted Use Pesticide. Liquid soil fumigant placed in the soil a minimum of 12" deep. Do not mow or fertilize treated areas for 5 days after application. This product can not be applied within 100 ft. of an occupied structure (Sod Production Only).
	Avid (abamectin)	57 fl. oz per acre	Special Local Need Label for Georgia (24c). On Golf Greens only. Apply Avid 0.15EC as an early curative treatment (after appropriate nematode extraction, identification and counts). Apply in the early morning while grass is wet with dew or irrigate the area prior to application with 0.1 inches of water. Immediately after application irrigate with 0.1 inches of water to move treatments through the thatch. Do not over irrigate. Apply 3 to 4 consecutive Avid 0.15EC applications on a 14 to 21 day interval. Do not apply to golf course tees, fairways, or roughs. Do not apply to residential turf, sports fields, commercial turf, or sod farms.

***Nemacure sales ceased May 2008. Use not restricted for end-users. Use until supply lasts.

Additional Notes on Nematode Control in Turfgrass

Nematodes are soil-dwelling, microscopic, colorless, unsegmented, round worms that can be plant parasitic or plant beneficial. Depending on the species of parasitic nematode and the numbers in soil, they are capable of causing turfgrass decline.

Above-ground symptoms of nematode damage begin with a yellowing of turf, followed by wilting and slow recovery from wilt, poor response of turf to fertilization and eventual thinning in irregular shapes, followed by weed invasion. These symptoms occur over months and years. While below-ground or root symptoms are characterized by short, stubby roots with few branch roots compared to healthy roots. Roots may have a dark brown color, and sometimes (with sting or stubby root nematodes) exhibit swollen root tips. In sod with severe infestations, the sod strength is low.

Soil sampling is necessary for accurate diagnosis. A quart-size sample is needed and your County Extension Agent can help you submit samples to the Extension Nematology Laboratory at The University of Georgia (2350 College Station Road, Athens GA 30602). The number of nematodes recovered from the soil sample can vary greatly, depending on the time of year and the growth stage of the plant at the time the samples are taken. Samples taken during the winter and early spring are less reliable, and some nematode species may be missed entirely. For routine assays, sample during the time of year that the turf is growing. For warm-season turfgrasses, June or July is an optimal time to detect high population densities. For cool-season grasses, late spring or early summer should detect harmful populations. If nematodes are not found in damaging numbers, it does not preclude their role if the time of year the sample was taken was unfavorable for their survival.

Most grasses can withstand moderate numbers of most kinds of nematodes. If nematode populations are high, improve turf management practices, planting a new grass type, and chemical control are management strategies. Usually a combination or integrated approach leads to the best success. Deep, infrequent watering encourage deeper rooting, allowing grass to obtain more water and nutrients than a turf having a short root system due to shallow, daily watering. Avoid excess nitrogen fertilization, this encourages lush, succulent roots conducive to nematode population buildup. Avoid stresses to turf such as mowing too short. Alleviate compacted soils and correct any nutrient deficiencies. No variety of turfgrass is known to have true resistance to all nema-

todes, but planting another grass species may be a choice if the new grass provides acceptable quality and is adapted to the site. Using proper management practices and best adapted turfgrass species is the most practical approach to nematode management.

Because crop rotation, varietal resistance, biological control and several other disease management strategies are not practical or effective for turfgrass nematode control, the use of chemical nematicides is the next available and most reliable approach to reducing parasitic nematode levels. Chemical nematicides can be applied as pre-plant fumigants and as post-plant non-fumigant contact chemicals. Fumigants are toxic to plants and are labeled for use only before establishment of the turfgrass stand. In established turfgrass, contact nematicides come in granular or spray formulations and are always watered-in immediately after application. All nematicides are extremely toxic to humans and animals and should be handled with all precautions indicated on the product label. No single product is effective against all nematodes on a given turfgrass species.

Soil fumigants are chemicals applied as gases or liquids that readily vaporize. They are toxic to the turfgrass but may be used to treat soil prior to seeding or planting to reduce populations of plant parasitic nematodes, weeds, fungal pathogens, and other soil-borne microorganisms. All labeled soil fumigants are Restricted Use pesticides that usually require special equipment and application by licensed professionals.

Chemical nematicides have shown best results when the turf is first stripped from the affected area, followed by thorough tilling of the soil two-weeks prior to the nematicide application, this practice allows for adequate decomposition of old roots. Additionally, tilling loosens the soil and permits more rapid and uniform diffusion of the fumigant. At the time of application the soil should be moist (not water-saturated). Too much fumigant escapes in dry soil and too little diffuses when pores are filled with water. The 4-inch soil temperature should be 50° to 80°F. Too much fumigant evaporates from hot soil, whereas, diffusion is too slow in cold soil. For maximum effectiveness, the treated area should be sealed immediately with plastic tarp for several days. Nematicide applications should be made in autumn or spring, before nematode population peak and according to the product label.

The effects of nematicides are temporary. Fumigants have no residual activity; therefore nematodes which survived the treatment or were brought in on new grass can re-colonize the rootzone. Nematicide treatment cannot provide improved growing conditions unless other stresses are alleviated, and nutrients (especially potassium) and water are readily available.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS

Patrick E. McCullough, Extension Agronomist-Weed Science

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
PREEMERGENCE HERBICIDES				
Applications must be made prior to weed emergence or poor control will result. Recommended dates of application for crabgrass and other annual grasses are February 15 - March 5 in south Georgia and March 1-20 in north Georgia. Recommended dates for annual bluegrass and selected winter annual weeds are September 1-15 in north Georgia and October 1-15 in south Georgia.				
atrazine (Aatrex) 4L (Aatrex) 90DG (Aatrex) 80W	centipede, St. Augustine, dormant bermudagrass, zoysia	1.0 - 2.0 qts. 1.1 - 2.2 lbs. 1.2 - 2.5 lbs.	1.0 - 2.0 1.0 - 2.0 1.0 - 2.0	Atrazine provides both preemergence and postemergence control of annual broadleaf weeds. Control of summer annual grasses is weak. Aatrex formulations are labeled for applications from October 1 to April 15. Avoid applications during green-up. For bermudagrass, atrazine should be applied only to dormant turf. DO NOT overseed 4 months before or 6 months after treatment. DO NOT apply within the active root zone of azaleas, camellias, boxwoods, etc. DO NOT apply more than 1.0 lb. ai/A on hybrid bermudagrasses. Atrazine is a Restricted Use Herbicide. Refer to atrazine - POSTEMERGENCE.
benefin (Balan) 2.5G (Other trade names)	Ky. bluegrass, bermudagrass, centipede, tall fescue, St. Augustine, zoysia	80.0 to 120.0 lbs.	2.0 to 3.0	Controls annual grasses and selected broadleaf weeds. An additional application may be made 8 weeks after the initial treatment for continued weed control. DO NOT apply to newly sprigged grasses until these turfs are well established. DO NOT use on golf course greens. DO NOT apply Balan 2.5G in the spring to fall planted turfgrasses. Delay reseeding for 6 weeks after application for the low rate, and for 12 to 16 weeks at the high rate.
bensulide (Bensumec) 4LF (Pre-San) 7G	Ky. bluegrass, bermudagrass, centipede, tall fescue, St. Augustine, zoysia	1.9 to 3.1 gals. 107.0 to 180.0 lbs.	7.5 to 12.5 7.5 to 12.5	Controls annual grasses and selected broadleaf weeds. Apply high rate in fall for annual bluegrass control. Apply a light irrigation immediately after treatment. DO NOT apply to newly sprigged grasses. Delay reseeding for 4 months after treatment. May be used on bermudagrass and bentgrass greens.
dimethenamid (Tower) 6 L	Ky. bluegrass, bahigrass, bermudagrass, centipede, tall fescue, St. Augustine, seashore paspalum, zoysia	21 to 32 fl. oz..	1 to 1.5	Controls annual grasses and broadleaf weed control. Tower may be applied to tees, fairways, roughs, and any other maintained turf areas on golf courses (except putting greens). In a single application, DO NOT apply more than the equivalent of 32 fluid ounces of Tower per acre. For extended weed control, sequential applications can be made 5 to 8 weeks between applications. DO NOT apply more than 64 fluid ounces of Tower per year. Tower may be applied in a sequential use program with other herbicides that control emerged weeds.
dithiopyr (Dimension 1EC) (Dimension Ultra 40%WSP) (each 5.0 oz. water soluble bag contains 0.125 lb. of dithiopyr) (Dimension 2EW)	Ky. bluegrass, buffalograss, bermudagrass, carpetgrass, centipede, tall fescue, zoysia, St. Augustine, seashore paspalum	2.0 qts. 0.95 lb. 2.0 pts.	0.5 0.38 0.5	Provides preemergence control of annual grasses and certain annual broadleaf weeds. Dimension will also provide postemergence control of crabgrass (when treated prior to the tillering stage of growth). Apply as a spring or fall application. For split applications, use Dimension 1EC up to 1.5 qts./acre per application, Dimension 2EW up to 1.5 pts./acre per application or Dimension Ultra at 0.625 lbs./acre per application. Bermudagrass can be overseeded with perennial ryegrass 6 to 8 weeks after a Dimension application. For other turfgrass areas do not reseed, overseed or sprig treated areas for 2.5 to 4 months after treatment (see label).
indaziflam (Specticle) 20WSP	Bahigrass, Bermudagrass, Buffalograss, Centipedegrass, St. Augustinegrass, Zoysiagrass	2.5 to 5 oz	0.03 to 0.06	Apply for preemergence control of annual bluegrass, crabgrass, goosegrass, annual sedges, and broadleaf weeds in warm-season grasses. Use only on established turf. Do not apply to desirable cool-season grasses, golf greens, or within 15 feet of golf greens. Indaziflam may affect sensitive grasses downslope from treated areas, do not use on slopes uphill and adjacent to bentgrass or bermudagrass golf greens. Do not apply more than 7.1 oz of product per acre in a 12 month period. Do not exceed 2.5 oz per acre in a single application to centipedegrass and St. Augustinegrass. Other labeled warm-season grasses may be treated with up to 5 oz of product per acre in a single application. See label for further information before using the herbicide.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
PREEMERGENCE HERBICIDES (continued)				
isoxaben (Gallery) 75DF	Ky. bluegrass, bermudagrass, buffalograss, centipede, tall fescue, zoysia, St. Augustine	0.66 to 1.33 lbs.	0.5 to 1.0	Controls a broad spectrum of annual broadleaf weeds. Apply in the late summer or early spring prior to annual broadleaf weed seed germination. Established turf may be overseeded 60 days following a Gallery application. DO NOT use on putting greens.
mesotrione (Tenacity) 4.0 lbs./gal.	Ky. Bluegrass, centipede, tall fescue, St. Augustinegrass (grown for sod)	4.0 to 8.0 fl. ozs.	0.125 to 0.25	Provides preemergence control of crabgrass, yellow foxtail and certain annual broadleaf weeds such as carpetweed and chickweed sp. Tenacity may be tank-mixed with pre-emergence herbicides such as Barricade for extended control of crabgrass and foxtail. Tenacity may also be applied at the time of seeding Ky. Bluegrass, centipede, or tall fescue. It may also be applied after new seedlings have been mowed two times or 4 weeks after emergence (whichever is longer). Do not exceed 4.0 fl. ozs./acre on St. Augustine sod. Tenacity may cause temporary whitening of turfgrass foliage (see label). If Tenacity is tank-mixed with atrazine or simazine for use on St. Augustine or centipede use only 4.0 fl. ozs. of Tenacity and 0.5 lbs. ai /acre of either atrazine or simazine. Zoysia, bermudagrass and seashore paspalum are sensitive to Tenacity. Do not use on golf course putting greens and maintain a five foot buffer between treated areas and putting greens.
metolachlor (Pennant Magnum) 7.62 lbs./gal.	bermudagrass, centipede, zoysia, St. Augustine	1.3 to 2.6 pts.	1.25 to 2.5	Controls annual sedge, yellow nutsedge and certain annual grass weeds. Split applications at intervals of 6 to 8 weeks will extend control. In sod fields do not apply more than 4.2 pts./acre per year. For other turf sites, the maximum annual rate is 2.6 pts. DO NOT use on putting greens.
oryzalin (Surflan) 4AS (Harrier) 85WDG	bermudagrass, buffalograss, centipede, tall fescue, zoysia, St. Augustine	1.5 to 2.0 qts. 1.75 to 2.4 lbs.	1.5 to 2.0 1.5 to 2.0	Controls annual grasses and selected broadleaf weeds. Apply 2.0 qts./A for summer annual grass control, or apply 1.5 qts./A and apply an additional 1.5 qts./A 8 to 10 weeks after the initial application. Split applications are recommended for improved goosegrass control and for tall fescue. DO NOT apply to newly sprigged grasses until well established. DO NOT apply to golf course greens. DO NOT make a spring application to fall planted turfgrasses. Surflan is recommended for use on healthy, established turf. Delay reseeding for 3 to 4 months after application.
oxadiazon (Ronstar) 2G (Oxadiazon) 2G (Ronstar) 50WSP (Oxadiazon) 50WSB (Starfighter) 3.17L	Ky. bluegrass, bermudagrass, buffalograss, seashore paspalum, tall fescue, zoysia, St. Augustine bermudagrass, St. Augustine, zoysia	100 to 200 lbs. 4.0 to 6.0 lbs. 2.5 to 3.8 qts.	2.0 to 4.0 2.0 to 3.0 2.0 to 3.0	Controls annual grasses and selected broadleaf weeds. DO NOT apply more than 3.0 lbs. ai/A on St. Augustine. May cause temporary discoloration of bermudagrass and St. Augustine which is normally outgrown in 2 to 3 weeks. DO NOT apply to wet turf. Delay reseeding for 4 months after treatment. DO NOT apply to centipede or golf course greens or tees. Ronstar 50WSP and Oxadiazon 50WSB are labeled only on bermudagrass, St. Augustinegrass and zoysia. Ronstar 2G may be used immediately prior or immediately after sprigging bermudagrass or zoysiagrass at 2.0 to 3.0 lbs. ai/acre to control various annual weeds. Ronstar G may also be applied 10 to 14 days after sprigging seashore paspalum. Ronstar 50WSP and Oxadiazon 50WSB may be applied immediately prior to or after sprigging bermudagrass. Oxadiazon is not labeled for use on home lawns.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
PREEMERGENCE HERBICIDES (continued)				
pendimethalin (Pendulum) 2G (Pendulum) 3.3 EC (Pendulum AquaCap) 3.8 CS	Ky. bluegrass, bermudagrass, centipede, tall fescue, zoysia, St. Augustine	75 - 150 lbs. 3.6 to 7.2 pts. 3.1 to 6.3 pts.	1.5 to 3.0 1.5 to 3.0 1.5 to 3.0	Controls annual grasses and selected broadleaf weeds. DO NOT use on newly sprigged turfgrasses. Not recommended for turfgrass that has been severely thinned due to winter stress. DO NOT reseed within 3 months of application. Use the low rate for tall fescue and Ky. bluegrass. The high rate may be used on warm season grasses. On newly seeded or sodded areas, delay application until after the fourth mowing. In established turfgrasses that have been reseeded, delay application until grass seedlings have been mowed 4 times. (This may be up to 3 months from the date of seeding.) Refer to label for information on split applications.
prodiamine (Barricade) 65WDG (ProClipse) 65WDG (Cavalcade) 65WDG (StoneWall) 65WDG (Barricade) 4L (RegalKade) 0.5G (RegalKade) 0.37G	Ky. bluegrass, bermudagrass, buffalograss, centipede, St. Augustine, seashore paspalum, zoysia, tall fescue	1.15 lbs. 1.5 pts. 100 to 300 lbs. 135 to 406 lbs.	0.75 0.75 0.5 to 1.5 0.5 to 1.5	Controls annual grasses and broadleaf weeds. DO NOT apply to newly seeded, sprigged or sodded turfgrasses. On fall-seeded turfgrasses, delay the application for 60 days after seeding or until after the second mowing, whichever is longer time period. Split applications, each at one-half the maximum annual labeled rate, at a 60 day interval, may also be used. DO NOT apply to golf course putting greens or tees. RegalKade and RegalKade 37 are formulated on a 32-3-12 dry fertilizer carrier. Barricade 65WDG at 0.58 to 1.0 lbs. product/acre may be applied 8 to 10 weeks before overseeding perennial ryegrass into bermudagrass fairways. Reseeding restrictions can range from 4 to 12 months, depending upon the product and rate used, reseeding method and environmental conditions. Refer to the individual product label for additional information.
pronamide (Kerb T/O) 50WSP	bermudagrass, centipede, St. Augustine, zoysia	1.0 to 2.0 lbs.	0.5 to 1.0	Preemergence or postemergence applications of Kerb will control annual bluegrass. May also be used in spring to slowly remove (4 to 6 weeks) overseeded perennial ryegrass from warm-season turfgrasses. For this purpose, apply Kerb at the 50% spring green-up warm-season turfgrass growth stage. A light overhead irrigation is necessary to move Kerb into the weed root zone if no rainfall occurs within 24 to 48 hours. DO NOT apply Kerb to any cool-season turfgrass. DO NOT apply to areas that will be overseeded with cool-season turfgrasses within 90 days of treatment. Kerb is a Restricted Use Herbicide.
simazine (Princep) 90DF (Princep Liquid) 4L Wynstar 90DF	bermudagrass, centipede, St. Augustine, zoysia	1.1 to 2.2 lbs. 1.0 to 2.0 qts. 1.1 to 2.0 lbs.	1.0 to 2.0 1.0 to 2.0 1.0 to 1.8	Apply simazine in October or November for preemergence control of winter annual weeds. Apply December through February for late postemergence control of winter annuals. Apply low rate for annual bluegrass control; or high rate for winter annual broadleaf control. DO NOT overseed with desirable turfgrass within 4 months before or 6 months after treatment. DO NOT apply more than 1.0 lb. ai/A on newly sprigged turfgrass or on hybrid bermudagrass such as Tiflawn, Tifway and Ormond.
benefin + oryzalin (XL) 2G	bermudagrass, centipede, tall fescue, zoysia, St. Augustine	100.0 to 150.0 lbs.	1.0 to 1.5 benefin + 1.0 to 1.5 oryzalin	Controls annual grasses and selected broadleaf weeds. DO NOT apply to newly sprigged grasses until well established. DO NOT apply to golf course greens. DO NOT make a spring application to fall planted turfgrasses. Delay reseeding for 6 weeks (low rate) and for 12 to 16 weeks (high rate) after application.
benefin + trifluralin (Team Pro) 0.86G (Team) 2G	Ky. bluegrass, bermudagrass, centipede, tall fescue, zoysia, St. Augustine	174 to 349 lbs. 100 to 150 lbs.	0.75 to 1.5 benefin + 0.75 to 1.5 Trifluralin 1.3 to 2.0 benefin + 0.7 to 1.0 trifluralin	Team Pro is a dry fertilizer based product that contains 0.43% benefin and 0.43% trifluralin. The fertilizer analysis will depend upon the respective company marketing the product. Controls summer annual grasses and annual bluegrass. Split applications of 233 lbs. product/acre followed 10 weeks later by an additional 233 lb. product/acre may also be used. DO NOT apply to newly sprigged grasses until well established. DO NOT apply to putting greens. Delay reseeding for 8 weeks (low rate) and for 12 to 16 weeks (high rate) after application.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
PREEMERGENCE HERBICIDES (continued)				
bensulide + oxadiazon (Goosegrass/Crabgrass Control) 5.25% + 1.31% G	Ky. bluegrass, bermudagrass, tall fescue, zoysia	115.0 lbs.	6.0 bensulide + 1.5 oxadiazon	Controls summer annual grasses. Apply a light irrigation after treatment. DO NOT use on newly sprigged grasses until well established. Delay reseeding for 5 months after treatment. Recommended for professional applicator use. May be used on bermudagrass and bentgrass greens under conditions of heavy goosegrass infestations. See label for precautions concerning use on putting greens.
oxadiazon (1.0%) + proflaminate (0.2%) (Regalstar II) (Regalstar G)	Ky. Bluegrass, bermudagrass, centipede, St. Augustine, tall fescue, zoysia	200.0 lbs.	2.0 oxadiazon + 0.4 proflaminate	Controls annual grasses. Regalstar II is formulated on a 38-0-0 ureaform nitrogen carrier. Regalstar G does not contain fertilizer. Apply to dry foliage. Delay applications to newly sprigged bermudagrass until after stolons have rooted and the grass has filled in. DO NOT apply to putting greens.
sulfentrazone + proflaminate (Echelon) 4SC	Ky. Bluegrass, bermudagrass, buffalograss, carpetgrass, centipede, seashore paspalum, tall fescue, zoysia	18.0 to 36.0 fl. ozs.	0.56 to 1.125	Controls annual grasses, certain annual broadleaf weeds, annual sedges, kyllinga sp. and yellow nutsedge. Use in established turfgrasses. May be applied after the second mowing of seeded grasses provided the grass has developed a uniform stand and a good root system. The high rate of 36.0 fl. ozs./acre is recommended only for use on bermudagrass. This product can provide postemergence control of some, small annual broadleaf weeds. Do not apply to newly installed sod until the sod has rooted and exposed edges have grown in. Do not add an adjuvant or surfactant to the spray solution. In sod fields do not apply Echelon within 3 months of harvest. Echelon is not labeled for use on golf course putting greens.
POSTEMERGENCE HERBICIDES				
atrazine (AAtrex) 4L (AAtrex) 90DG (AAtrex) 80W	centipede, St. Augustine, dormant bermudagrass, zoysia	1.0 - 2.0 qts. 1.1 - 2.2 lbs. 1.2 - 2.5 lbs.	1.0 - 2.0 1.0 - 2.0 1.0 - 2.0	Apply to dormant bermudagrass for annual bluegrass and winter annual broadleaf weed control. DO NOT apply during bermudagrass green-up. AAtrex formulations may be applied from October 1 to April 15. DO NOT apply over the root zone of ornamental shrubs. For spurweed, apply in December or January. For Florida betony, apply in late October and follow with a second treatment in late February. DO NOT apply more than 1.0 lb. ai/A to hybrid bermudagrass. AAtrex is a Restricted Use Herbicide.
bentazon (Basagran T/O) 4.0 lbs./gal. (Lescogran) 4.0 lbs./gal.	Ky. bluegrass, bermudagrass, centipede, tall fescue, zoysia, St. Augustine	1.5 to 2.0 pts.	0.75 to 1.0	Apply to emerged, actively-growing yellow nutsedge. Use 2.0 pts./acre and repeat the application 7 to 14 days later. Thorough spray coverage is essential for acceptable control. DO NOT mow 3 days before or after application. Other weeds controlled include annual sedges and dayflower. Add a crop oil concentrate at 2.0 pts./acre to the spray mix. Bentazon is not recommended for use on putting greens.
bentazon + atrazine (Prompt) 5L 2.5 + 2.5 lbs./gal.	centipede, St. Augustine, zoysia	1.8 to 2.4 pts.	0.6 to 0.75 + 0.6 to 0.75	Controls several broadleaf weeds. For yellow nutsedge, initially apply Prompt at 3.5 pts./acre and follow 7 to 10 days later with Basagran at 2.0 pts./acre. Apply no earlier than 10 days after sprigging or plugging turfgrasses. On newly sprigged turfgrasses and hybrid bermudagrass, Prompt may cause temporary injury.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES (continued)				
bispyribac-sodium (Velocity) 80SP (Velocity) 17.6SG	bermudagrass overseeded with perennial ryegrass on golf course fairways	2.0 oz./1.5 acres 6.0 ozs.	0.06	Apply Velocity between February 1 and March 15 to bermudagrass overseeded the previous fall with perennial ryegrass for annual bluegrass control and seedhead suppression. Earlier or later applications may decrease efficacy or increase risk of injury to perennial ryegrass. The first application should be made just as soon as annual bluegrass seedhead begin to emerge from the leaf sheath. Apply a second application at the same rates 14 to 21 days after the first application. DO NOT apply if air temperatures are less than 50°F. or if maximum temperatures are expected to be less than 50°F. for the first three days after application. Two applications as described above will be needed for control. Chlorosis (yellowing) will typically occur on perennial ryegrass between 7 and 21 days after application. Not recommended for applications above 80°F., or when air temperatures are expected to exceed 80°F. for first three days after application . Foliar fertilization at 3 to 4 days after a Velocity application may reduce chlorosis. It is not necessary to add a spray adjuvant to Velocity. DO NOT apply to golf course greens, non-overseeded bermudagrass, or to ryegrass mowed < 3/8 inches. Not recommended for use on other cool-season turfgrasses. Velocity should not be applied in late spring after bermudagrass begins active growth. DO NOT mow or irrigate for 24 hours after application.
bromoxynil (Buctril) 2.0 lbs./gal.	Ky. bluegrass, bermudagrass, tall fescue, zoysia, St. Augustine	1.5 pts.	0.375	Labeled for use on non-residential turfgrasses. May be used on newly-sprigged or newly-seeded grasses. Apply as a summer or winter treatment to control seedling annual broadleaf weeds. Buctril is a contact herbicide and uniform spray coverage is essential.
carfentrazone (Quick Silver) T&O 1.9 lb./gal. (QuickSilver) 1.03 lb./gal.	Ky. bluegrass, tall fescue, bermudagrass, centipede grass, seashore paspalum, St. Augustine grass, zoysiagrass water-soluble 5 ml bag	0.9 to 2.1 fl. ozs. 0.8 to 2.0 fl. ozs.	0.013 to 0.031	Controls numerous broadleaf weeds including plantains, chickweed(s), dandelion, thistle(s), lawn burweed, henbit, corn speedwell, purslane(s) and spotted spurge. QuickSilver may also be applied to newly-seeded, sodded or sprigged turfgrasses. To expand the weed spectrum, QuickSilver may be tank-mixed with numerous other postemergence herbicides. Aim formulations are registered for use only on seed and sod farms. Add a nonionic surfactant at 0.125 to 0.25% v/v to the spray mix.
carfentrazone (0.04 lb./gal.) + 2,4-D (0.52 lbs./gal.) + MCPP (0.2 lbs./gal.) + dicamba (0.05 lbs./gal.) (SpeedZone - Southern)	Ky. bluegrass, tall fescue, bermudagrass, centipede grass, seashore paspalum, St. Augustine grass, zoysiagrass	2.0 to 5.0 pts.	--	Controls a wide range of broadleaf weeds, including spotted spurge. May be applied after the second mowing in newly-established cool-season turfgrasses, or 4 weeks after sprigging or sodding warm-season turfgrasses. DO NOT reseed until 1 week after application. DO NOT apply at air temperatures > 90° F. DO NOT apply during the spring green-up of St. Augustine grass, or to 'Floritam', 'Bitter-Blue' and other improved varieties of St. Augustine grass.
carfentrazone (0.04 lb./gal.) + MCPA (2.21 lbs./gal.) + MCPP (0.44 lbs./gal.) + dicamba (0.22 lbs./gal.) (PowerZone)	Ky. bluegrass, tall fescue, bermudagrass, zoysiagrass	2.0 to 6.0 pts.	--	Controls a wide range of broadleaf weeds, including spotted spurge. May be applied after the second mowing in newly-established cool-season turfgrasses, or 4 weeks after sprigging or sodding warm-season turfgrasses. DO NOT reseed until 2 weeks after application. DO NOT apply at air temperatures > 90°F.
carfentrazone (0.05 lb./gal.) + 2,4-D (1.53 lbs./gal.) + MCPA (0.48 lbs./gal.) + dicamba (0.14 lbs./gal.) (SpeedZone)	Ky. bluegrass, tall fescue, bermudagrass, zoysiagrass	2.0 to 5.0 pts	--	Controls a wide range of broadleaf weeds, including spotted spurge. May be applied after the second mowing in newly-established cool-season turfgrasses, or 4 weeks after sprigging or sodding warm-season turfgrasses. DO NOT reseed until 2 weeks after application. DO NOT apply at air temperatures > 90°F.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES (continued)				
chlorsulfuron (Corsair) 75DF	Ky. bluegrass, bermudagrass, centipede, St. Augustine, zoysia	1.0 to 5.33 oz.	0.05 to 0.25	Particularly effective for the control of "clump-type" tall fescue. Labeled only as spot treatment in lawns, but may be applied as a broad cast application on golf courses. Add a nonionic surfactant at 1/4 to 1/3 fl. oz. per gallon of spray mix. DO NOT apply to ryegrass or tall fescue being grown as a turfgrass.
clethodim (Envoy) 0.94 lbs./gal.	centipede (sod farms only)	17.0 to 34.0 fl. oz..	0.125 to 0.25	Envoy may be used for annual grass control and common bermudagrass suppression on centipede sod farms. Add a nonionic surfactant at 0.25% v/v. Use two applications, spaced 3 to 4 weeks apart, for bermudagrass suppression. Apply no sooner than 3 weeks after spring green-up. DO NOT use on centipede being grown for seed. Avoid mowing one week before or after treatment.
clopyralid (Lontrel) 3 lbs./gal.	Ky. bluegrass, bermudagrass, buffalograss, centipedegrass, St. Augustinegrass, tall fescue, zoysia	0.25 to 1.33 pts.	0.09 to 0.5	Effectively controls numerous broadleaf weeds that belong to the aster and legume families. Control of other broadleaf weed species is poor. Sold in combination with triclopyr as Confront. Clopyralid is not labeled for use on residential turfgrasses.
2,4-D (Weedar 64) 3.8 lbs./gal. (Other trade names)	Ky. bluegrass, bermudagrass, centipede, tall fescue, zoysia	See Label	0.5 to 2.0	Amine formulations of 2,4-D are non-volatile and are safer than ester formulations to use near ornamentals. Apply to small and actively growing broadleaf weeds as a summer or winter treatment. To control wild garlic/onion, use 2.0 lbs. ai/A plus surfactant. Make first application in late November or early December and follow with a second application in February or March. Repeat this schedule for 3 consecutive years to control this weed. DO NOT apply 2,4-D to St. Augustinegrass. DO NOT apply more than 0.5 lb. ai/A of 2,4-D to centipede. DO NOT allow spray drift to contact the foliage of ornamentals.
2,4-D + MCPP + dicamba (Three-way) (Trex-San) (Triplet) (Other trade names)	Ky. bluegrass, bermudagrass, tall fescue, zoysia	See Label	0.75 + 0.4 + 0.08	Several commercial formulations are available. Refer to individual labels for the recommended amount of formulated product. Controls a broader spectrum of broadleaf weeds than 2,4-D alone. DO NOT spray when turfgrass is emerging from winter dormancy. Low rates of Triplet products may be used on St. Augustine or centipede. Avoid applications if air temperatures exceed 85°F. Delay reseeding for 4 weeks after treatment.
2,4-D + MCPP + 2,4-DP (Triamine) (Dissolve)	Ky. bluegrass, tall fescue, bermudagrass, centipedegrass, St. Augustinegrass, zoysiagrass	See Label	See Label	Refer to individual labels for recommended amount of formulated product. Controls a broader spectrum of weeds than 2,4-D alone. DO NOT spray at air temperatures greater than 85°F and when warm-season turfgrasses are growing under stress conditions. Delay reseeding for 4 weeks after treatment. Avoid applications when warm-season turfgrasses are emerging from winter dormancy.
2,4-D + clopyralid + dicamba (Millennium Ultra)	Ky. bluegrass, tall fescue, bermudagrass, zoysiagrass	2.0 to 3.0 pts.	--	Controls a broader spectrum of weeds than 2,4-D alone. DO NOT mow 1 to 2 days before or after application. Delay application to newly seeded grasses until after 3 to 4 mowings. Delay reseeding for 3 to 4 weeks after application. DO NOT spray when air temperatures are >90°F. Not recommended for use on centipedegrass and St. Augustinegrass. Avoid applications during the spring transition of warm-season turfgrasses. Not labeled for use on residential turfgrasses.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES (continued)				
2,4-D + fluroxypyr + dicamba (Escalade)	Ky. bluegrass, tall fescue, bermudagrass, zoysiagrass	2.0 to 3.0 pts.	--	Controls a broader spectrum of weeds than 2,4 -D alone. DO NOT mow 1 to 2 days before or after application. Delay application to newly seeded grasses until after 3 to 4 mowings. Delay reseeding for 3 to 4 weeks after application. DO NOT spray when air temperatures are >90°F. Not recommended for use on centipedegrass and St. Augustinegrass. Avoid applications during the spring transition of warm-season turfgrasses.
2,4-D + triclopyr (Turflon II Amine) 2.8 + 1.1 lb. /gal.	Ky. bluegrass, tall fescue	1.0 to 2.0 qts.	0.7 + 0.3 to 1.4 + 0.6	Controls a broader spectrum of weeds than 2,4 -D alone. NOT RECOMMENDED for warm-season grasses. Apply in spring or fall months when weeds are actively growing. Newly seeded turf should be mowed 3 times before application. DO NOT reseed until 3 weeks after application. Repeat applications are recommended for corn speedwell, ground ivy, woodsorrel, parsley-piert and wild violet(s).
2,4-D + triclopyr + Sulfentrazone + dicamba (T Zone) 1.75 + 0.5 + 0.06 + 0.2 lbs. /gal.	Ky. bluegrass, bahiagrass (DORMANT) bermudagrass (DORMANT) ryegrass, tall fescue, zoysia (DORMANT)	2 to 4 pts.	0.44 + 0.125 + 0.015 + 0.05 to 0.88 + 0.25 + 0.03 + 0.1	Apply to cool-season turfgrasses for broadleaf weed control and suppression. Apply to fully DORMANT bermudagrass, bahiagrass, or zoysiagrass only and DO NOT apply to bentgrasses or greens. T Zone is labeled for yellow nutsedge suppression. Add more sulfentrazone with this product to increase activity on sedges. DO NOT apply when temperatures exceed 85° F or if turf is under stress from drought, heat or disease.
dicamba (Vanquish) 4 lbs./gal.	Ky. bluegrass, bermudagrass, centipedegrass, tall fescue, zoysia	0.5 to 1.0 pts.	0.25 to 0.5	Apply to small and actively-growing broadleaf weeds as a summer or winter treatment. Provides better control of henbit, knotweed, lespedeza, clovers, docks and woodsorrel than 2,4-D. Repeat treatment if necessary. DO NOT apply to St. Augustinegrass. DO NOT use over the root zone of ornamental trees and shrubs.
diclofop-methyl (Illoxan) 3EC	bermudagrass (golf courses only)	1.0 to 1.4 qts.	0.75 to 1.0	Illoxan may be used for goosegrass control on bermudagrass golf courses. Use the high rate for goosegrass with one to two tillers. Lower rates may be used on smaller goosegrass. DO NOT mow for 24 to 36 hours after application. Control requires 2 to 3 weeks. May cause temporary phytotoxicity (7 to 10 days.) DO NOT mix with other pesticides or fertilizers as control will be reduced. DO NOT overseed treated areas for at least 2 months after the last application. Illoxan is a Restricted Use Pesticide.
diquat (Reward) 2.0 lbs./gal.	DORMANT BERMUDAGRASS	1.0 to 2.0 pts.	0.25 to 0.5	Controls certain winter annual broadleaf weeds, such as little barley, annual bluegrass, henbit and Carolina geranium in dormant bermudagrass in lawns, parks and golf courses. A nonionic surfactant at 0.25% v/v should be added to the spray mix. Apply only to dormant bermudagrass.
ethofumesate (Prograss) 1.5EC	Dormant bermudagrass	5.4 to 5.9 pts.	1.0 to 1.1	Apply Prograss only to dormant bermudagrass in the fall one to two weeks after emergence of perennial ryegrass for the control of annual bluegrass. An additional application at 1.0 lb. ai/acre at 21 to 28 day intervals may be required to maintain control. The initial treatment may cause immediate browning of bermudagrass that is not completely dormant. DO NOT apply Prograss after Jan. 15 to overseeded bermudagrass. Applications after this date can severely delay bermudagrass growth in the spring. Prograss is not labeled for use on golf course putting greens.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES (continued)				
ethofumesate (Prograss) 1.5EC + Atrazine (numerous formulations)	St. Augustinegrass	2.0 gals. + 2.0 lbs. ai/acre	3.0 + 2.0	Prograss + atrazine may be used to control bermudagrass in St. Augustinegrass. Make the first application in mid-March when bermudagrass initiates green-up. Repeat this application 30 days later. Use of this application timing is critical for control. Temporary St. Augustinegrass stunting may occur. Avoid improper overlapping of the spray pattern.
fenoxaprop (Acclaim Extra) 0.57 lb./gal.	Ky. bluegrass, fine and tall fescue, zoysia	13.0 - 39.0 fl. oz.	0.06 to 0.17	Controls annual grasses. Apply in late spring or early summer to weedy grasses in the 3-leaf (low rate) to 5-tiller (high rate) growth stage. Repeat application at 14 days if weed regrowth has occurred and no turfgrass in jury is present. DO NOT tank mix Acclaim with phenoxy containing herbicides. Fescues and ryegrasses may be seeded immediately after application. Acclaim may be used on newly plugged zoysia and seedling fescues and perennial ryegrasses that is 4 weeks old. Acclaim Extra + Turflon Ester tank-mixtures can be used to control bermudagrass in tall fescue and zoysiagrass.
flazasulfuron (Katana) 25WG	Bermudagrass, Centipedegrass, Zoysiagrass	0.25 to 3 oz		Flazasulfuron (Katana) is a selective herbicide for removal of overseeded cool-season grasses as well as control of annual and perennial grasses, sedges, and broadleaf weeds in bermudagrass, zoysiagrass and certain other warm-season turfgrasses. Flazasulfuron has postemergence and some preemergence activity and may be used on golf courses (fairways, roughs, and tees) and the following non-residential turf areas: industrial parks, tank farms, sod farms, seed farms, cemeteries, professionally managed college and professional sports fields and commercial lawns for control of cool-season grasses and weeds from tolerant grasses. The maximum yearly application rate is 9.0 oz. per acre. Use only on labeled turfgrasses or severe injury may result. Do not apply to newly seeded, sodded, or sprigged turfgrass until well established. Allow at least 2 weeks from the last application to the time of overseeding when applied at 1.5 oz per acre. Allow 4 weeks for rates above 1.5 oz per acre.
fluazifop-butyl (Fusilade II) 2.0 lbs./gal.	tall fescue, zoysiagrass	3.0 to 6.0 fl. oz.	0.05 to 0.10	Use to control common and hybrid bermudagrass in zoysiagrass and tall fescue. Tank-mix with Turflon Ester to improve control of bermudagrass. In zoysiagrass, apply 3.0 to 4.0 fl. oz./A plus 0.25% v/v nonionic surfactant. Make the first application around June 1, and repeat every 20 to 30 days. Reduce the rate to 2.0 to 3.0 fl. oz./A in the late summer. In tall fescue, apply 5.0 to 6.0 fl. oz./A plus 0.25% v/v nonionic surfactant in the spring (April-May) as bermudagrass begins to green-up. Repeat the application in September-October. DO NOT apply to tall fescue during the hot summer months. Some injury (discoloration) will occur on tall fescue for up to 14 days after application.
fluroxypyr (Spotlight) 1.5 lb./gal.	Ky. bluegrass, tall fescue, bermudagrass, centipedegrass, zoysiagrass, St. Augustinegrass	0.67 to 1.33 pts.	0.125 to 0.25	Controls numerous broadleaf weeds including common purslane, chickweed(s), white clover, ground ivy and woodsorrel Apply to newly seeded turf after 2 to 3 mowings or to established turf. To broaden weed spectrum, Spotlight can be mixed with other labeled turf herbicides. Use Spotlight on bermudagrass and St. Augustinegrass only at 0.67 pt./acre and only if some injury can be tolerated. Not recommended for use on golf course putting greens.
foramsulfuron (Revolver) 0.19 lbs./gal.	bermudagrass, zoysiagrass	8.8 to 26.2 fl. ozs.	0.013 to 0.04	Apply Revolver for: a) control of undesirable cool-season grasses (including tall fescue), b) control of emerged annual bluegrass 1 week before overseeding bermudagrass with perennial ryegrass, c) postemergence control of goosegrass in late spring and early summer, and d) spring transition of bermudagrass overseeded the previous fall with cool-season turfgrasses. For tillered goosegrass, make 2 applications at the high rate 7 to 14 days apart. A tank-mix of Revolver at 26.2 fl. ozs. + MSMA (normal rate) applied twice 3 to 4 weeks apart will control dallisgrass. Late summer and early fall applications of this tank-mix usually provide better control than earlier applications. DO NOT apply Revolver within 2 weeks of sprigging. Revolver is rainfast within 2 hours of application.
glufosinate (Finale) 1.0 lb./gal.	DORMANT BERMUDAGRASS	3.0 to 6.0 qts./acre	0.75 to 1.5	Controls numerous winter annual broadleaf weeds and annual bluegrass in completely dormant bermudagrass. DO NOT apply during spring green-up.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES (continued)				
glyphosate (Roundup Pro) 4 lbs./gal.	bermudagrass (dormant)	0.75 pt.	0.375	APPLY ONLY TO DORMANT BERMUDAGRASS. Controls annual bluegrass. Apply in 5 to 20 gals. water/A. DO NOT apply during green-up or to actively growing bermudagrass.
halosulfuron (SedgeHammer) 75DF	Ky. bluegrass, bermudagrass, centipede, St. Augustine, tall fescue, zoysia, seashore paspalum	0.67 to 1.33 ozs.	0.031 to 0.062	Controls yellow and purple nutsedge, and suppresses green kyllinga. A second application may be needed 6 to 10 weeks after the initial application. Apply at the 3 to 8 leaf nutsedge growth stage. Add a nonionic surfactant at 0.5% v/v (2.0 qts./100 gals.). DO NOT mow 2 days before or after application. DO NOT apply to golf course putting greens.
imazaquin (Image) 70DG	bermudagrass, centipede, zoysia, St. Augustine	8.6 to 11.4 ozs.	0.37 to 0.5	Controls nutsedge(s), wild garlic and selected broadleaf weeds. Add a nonionic surfactant (1.0 qt./100 gals.). The addition of M SMA (bermudagrass only) will aid in control of nutsedge(s) and escaped weedy grasses. Two applications per year, at an interval of 6 to 8 weeks, will be needed to control purple nutsedge. DO NOT apply when turfgrass is emerging from winter dormancy. Image will severely injury fescue(s) and ryegrass(s). DO NOT apply to newly planted or sprigged lawns or golf greens.
MCPA + MCP + 2,4-DP (Triamine II) (Tri-Ester II) (Trimec Encore)	Ky. bluegrass, tall fescue, bermudagrass, centipede,grass, St. Augustinegrass, zoysiagrass	See Label	See Label	Refer to individual labels for recommended amount of formulated product. Controls a broader spectrum of weeds than 2,4-D alone. DO NOT spray at air temperatures greater than 85°F, and when warm-season turfgrasses are growing under stress conditions. Delay reseeding for 4 weeks after treatment. Trimec Encore is not labeled on St. Augustine.
MCPA + triclopyr + dicamba (Cool Power) (HorsePower)	Ky. bluegrass, tall fescue, bermudagrass, zoysiagrass	See Label	See Label	Controls a broader spectrum of weeds than 2,4-D alone. Cool Power is an ester formulation of MCPA + triclopyr + dicamba primarily for use during the cool winter months. HorsePower contains amine formulations of these herbicides. DO NOT mow 1 to 2 days before or after application. Delay application to newly seeded grasses until after 3 to 4 mowings. Delay reseeding for 3 to 4 weeks after application. Avoid applications during the spring transition of warm-season turfgrasses.
MCPA + MCP + dicamba (Tri-Power)	Ky. bluegrass, tall fescue, bermudagrass, zoysiagrass	See Label	See Label	Controls a broader spectrum of weeds than 2,4-D alone. DO NOT mow 1 to 2 days before or after application. Delay application to newly seeded grasses until after 3 to 4 mowings. Delay reseeding for 3 to 4 weeks after application. Avoid applications during the spring transition of warm-season turfgrasses unless a slight delay in green-up can be tolerated.
MCP + 2,4-D + dicamba (Trimec Southern)	Ky. bluegrass, bermudagrass, centipede, tall fescue, zoysia, St. Augustine	See Label	0.7 + 0.4 + 0.08	Controls a broader spectrum of weeds than 2,4-D alone. DO NOT spray when turfgrass is emerging from winter dormancy. Avoid application if air temperatures exceed 85°F. Delay reseeding for 4 weeks after application. Refer to label for rates for St. Augustine and centipede.
metribuzin (Sencor) 75 Turf	bermudagrass	0.67 lb.	0.5	Dormant bermudagrass: Apply to emerged winter annual weeds. Make only 1 application per season. Actively growing bermudagrass: Apply to bermudagrass that is actively growing and not under stressed conditions. Controls goosegrass and selected annual weeds. DO NOT make more than two applications per season. Sencor may cause temporary discoloration. Delay mowing treated areas for at least 3 days.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES (continued)				
metribuzin (Sencor) 75 Turf + MSMA (Several trade names)	bermudagrass	2.6 dry oz. + See Label	0.125 + 2.0	This tank mix provides better control of goosegrass than the use of MSMA alone. Apply ONLY to established bermudagrass that is actively growing and not under stressed conditions. Two applications spaced 7 to 10 days apart may be necessary for acceptable control.
metsulfuron (Manor) 60DF (Blade) 60DF	Ky. bluegrass, bermudagrass, centipede, St. Augustine, zoysia	0.25 to 1.0 oz.	0.009 to 0.037	Controls a wide range of broadleaf weeds, 'Pensacola' bahiagrass and wild garlic/onion. May also be used hasten the spring transition of bermudagrass overseeded with perennial ryegrass to bermudagrass. Add a nonionic surfactant at 0.25% v/v. DO NOT exceed 0.5 oz. on centipede or Kentucky bluegrass. DO NOT overseed for 8 weeks after application, or plant woody ornamentals in treated areas for one year after application. Not recommended for use on tall fescue.
metsulfuron + sulfentrazone (Blindside) 66WDG (6% + 66%)	Bermudagrass Centipedegrass St. Augustinegrass Tall Fescue Zoysiagrass	3.25 to 10 oz	0.13 to 0.41 (0.01 + 0.12 to 0.038 + 0.375)	Apply for selective post-emergence control of annual grasses, broadleaf weeds and sedges in established turf areas including, but not limited to, residential, commercial and institutional lawns, athletic fields, commercial sod farms, golf course fairways and golf course roughs. Best weed control results will be obtained when no rainfall or irrigation occurs within 24 hours after application. If no rainfall or irrigation occurs within 7 days after applications in the amount of 0.5 inches, then irrigation of at least 0.5 inches is recommended. Do not apply to tall fescue at temperatures above 75°F. Do not apply to centipedegrass during spring transition. Use the lowest rate for tall fescue. Do not apply to golf course putting greens, collars or tees. Do not use on turfgrass other than those listed on the label or turfgrass under stress. See product label for further information before use.
MSMA (Bueno 6) 6.0 lbs./gal. (Daconate 6) 6.0 lbs./gal. (Other trade names) DSMA (DSMA Liquid) 3.6 lbs./gal. (Weed-E-Rad 360) 3.6 lbs./gal. (Other trade names)	Ky. bluegrass, bermudagrass, tall fescue	2.7 pts. 2.7 pts. 1.0 gal. 1.0 gal.	2.0 2.0 3.6 3.6	These herbicides control emerged annual grasses, bahiagrass, and dallisgrass and provide fair control of nutsedge. Multiple applications spaced 7 to 10 days apart are needed for acceptable control. Temporary discoloration of turf will occur. May be applied to newly sprigged bermudagrass at the above rates. On new stands of fescue, apply one-half rate after 3 mowings. Add a surfactant according to label directions. Zoysiagrass cultivars vary in tolerance to MSMA. 'Meyer' is more tolerant than 'Emerald' or 'Matrella'. DO NOT apply to centipede or St. Augustine
pronamide (Kerb T/O) 50WSP	bermudagrass, centipede, St. Augustine, zoysia	1.5 to 3.0 lbs.	0.75 to 1.5	Pronamide will control emerged annual bluegrass, corn speedwell, and common chickweed. Increase rate as annual bluegrass approaches maturity. Pronamide acts slowly (3 to 5 weeks) on seedling to mature annual bluegrass. DO NOT apply to any cool season grass. A light overhead irrigation is necessary to move Kerb into the weed root zone if not rainfall occurs within 24 to 48 hours. Kerb is a Restricted Use Herbicide.
quinclorac (Drive) 75DF (Drive XLR8) 1.5 SL	Ky. bluegrass, bermudagrass, seashore paspalum, tall fescue, zoysiagrass	1.0 lbs. 64 fl. oz.	0.75 0.75	Provides excellent control of crabgrass, barnyardgrass and clovers with one application. Multiple applications will also provide control of torpedograss. Add methylated seed oil at 1.5 pts./A to the spray mix. DO NOT mow 2 days before or after application. Drive may also be applied before, at, and during seedling emergence of bermudagrass, tall fescue and zoysiagrass. DO NOT add an adjuvant until 28 days after emergence. Apply under conditions of good soil moisture. For best results do not irrigate for 24 hours after application. DO NOT apply to bahiagrass, carpetgrass, St. Augustinegrass or centipedegrass. DO NOT apply to exposed feeder roots of ornamental trees and shrubs.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES (continued)				
quinclorac (0.75 lb/gal) + 2,4-D (1 lb/gal) + dicamba (0.125 lb/gal) (Quincept)	Bentgrass, bermudagrass, Ky. bluegrass, buffalograss, tall fescue, ryegrass, zoysiagrass	7 to 8 pts	0.66 + 0.88 + 0.1 to 0.75 + 1 + 0.125	Apply to residential and nonresidential cool-season turfgrasses for broadleaf weed control and suppression or control of grassy weeds. Apply lower rates on bermudagrass and zoysiagrass and DO NOT apply to greens. Controls young barnyardgrass, crabgrass, and foxtails but repeat applications may be needed for complete control of mature plants. DO NOT apply when temperatures exceed 90° F or if turf is under stress from drought, heat, or disease.
quinclorac + dicamba + MCPP (One-Time) 2.45 SL	Ky. bluegrass, bentgrass, bermudagrass, seashore paspalum, tall fescue, zoysiagrass	21 to 64 fl. oz	0.25 + 0.03 + 0.12 to 0.75 + 0.1 + 0.375	Controls broadleaf weeds, barnyardgrass, crabgrass, foxtails, and torpedograss in cool and warm-season turfgrasses. Repeat application may be needed for grassy weed control. Do NOT apply more than 128 fl. oz./acre in one year or more than two applications per year. DO NOT apply to golf course collars, greens, or turf grown for sod. DO NOT apply to fine fescue, bahiagrass, St. Augustinegrass, or centipedegrass.
quinclorac + carfentrazone (Square One) 70WDG (0.66 + 0.04)	Bermudagrass Bluegrasses Buffalograss Fine Fescue Perennial Ryegrass Tall Fescue Seashore Paspalum Zoysiagrass	8 to 18 oz	0.35 to 0.79 (0.33 + 0.02 to 0.75 + 0.05)	Apply for postemergence control of annual grasses and broadleaf weeds in established turf areas including residential, commercial and institutional lawns, athletic fields, commercial sod farms, golf course fairways and golf course roughs. SquareOne is absorbed by shoots, foliage and roots and can be applied to several turfgrasses at 7 days or more after emergence by both seeding and sprigging (See Label). Application to zoysiagrass should be delayed until at least 14 days after emergence to avoid extended discoloration. Slight discoloration may be observed immediately after application for hybrid bermudagrass, however, normal turf color returns by 12 days after emergence if no other stresses are present. Areas treated with SquareOne Herbicide may be seeded or overseeded one day following application. This product may be applied to established sod. See product label for further information before use.
rimsulfuron (Tran Xit GTA) 25DF	bermudagrass, centipedegrass, zoysiagrass	1.0 to 2.0 ozs.	0.016 to 0.032	May be used: a) to control annual bluegrass before overseeding bermudagrass with perennial ryegrass or <i>Poa trivialis</i> ; b) to control annual bluegrass and certain weeds in non-overseeded bermudagrass, centipedegrass and zoysiagrass and c) to remove perennial ryegrass or <i>Poa trivialis</i> from bermudagrass in the late spring. Add a nonionic surfactant at 0.25% v/v. Apply 10 to 14 days in late summer or early fall before overseeding bermudagrass. DO NOT apply after overseeding, or to bentgrass putting greens. To hasten spring transition on overseeded bermudagrass, apply at the 60 to 75% green-up growth stage of bermudagrass, or approximately 2 to 3 weeks before transition is desired. DO NOT apply to residential lawns, cool-season turfgrasses or to newly sprigged or sodded bermudagrass.
sethoxydim (Segment) 1.0 lb./gal.	centipede, fine fescue	1.5 to 2.25 pts	0.19 to 0.28	Apply sethoxydim only to centipede and fine fescues (creeping red, Chewings, hard fescue). Other turfgrasses, including tall fescue, will be severely injured by sethoxydim. Controls annual grasses and suppresses bahiagrass growth. Apply no sooner than 3 weeks after green-up. DO NOT exceed 1.5 pts./acre on seedling centipede. DO NOT mow 7 days prior to or after application. Two applications per season may be utilized in seedling and established centipede. For bahiagrass suppression, repeat treatment 10 to 14 days after the first application.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES (continued)				
sulfentrazone (0.06 lb./gal.) + 2,4-D (1.4 lbs./gal.) + MCPP (0.5 lbs./gal.) + dicamba (0.22 lbs./gal.) (Surge)	Ky. bluegrass, tall fescue, bermudagrass, zoysiagrass	2.75 to 4.0 pts.	--	Controls a wide range of broadleaf weeds, including spotted spurge. This product will also provide some suppression of small, actively-growing yellow nutsedge. May be applied after the second mowing in newly-established cool-season turfgrasses, or 4 weeks after sprigging or sodding warm-season turfgrasses. DO NOT reseed until 3 weeks after application. DO NOT apply at air temperatures > 90° F, or during the spring transition of warm-season turfgrasses.
sulfentrazone (Dismiss) 4.0SC (Spartan) 4F	Ky. bluegrass, tall fescue, bermudagrass, centipedegrass, St. Augustinegrass, seashore paspalum, zoysiagrass	4.0 to 12.0 fl. ozs.	0.125 to 0.375	Controls nutsedge(s), annual sedges, kyllinga species and a wide range of broadleaf weeds. Apply to established grasses, or to newly established grasses (seeded or sodded) after the second mowing. Treated areas may be reseeded or sodded 3 months after application. Overseeding with perennial ryegrass may be done 6 weeks after application if slight injury to ryegrass can be tolerated. Do not apply Dismiss within 3 months of sod harvest. Dismiss is not recommended for use on golf course putting greens. Spartan is labeled for use only on seed and sod farms.
sulfentrazone (0.06 lb/gal) + quinclorac (0.5 lb/gal) + 2,4-D (0.88 lb/gal) + dicamba (0.09 lb/gal) (Q4, Q4 Plus)	Ky. bluegrass, tall fescue, bermudagrass (DORMANT), buffalograss (DORMANT), ryegrass, zoysiagrass (DORMANT)	7 to 8 pts	0.05 + 0.04 + 0.77 + 0.08 to 0.06 + 0.5 + 0.88 + 0.09	Apply to cool-season turfgrasses for broadleaf weed control and suppression or control of grassy weeds. Apply to fully DORMANT bermudagrass, buffalograss, or zoysiagrass only and DO NOT apply to bentgrasses or greens. Controls young barnyardgrass, crabgrass, and foxtails but repeat applications will be needed for complete control of mature plants. Q4 is labeled for yellow nutsedge suppression. Add more quinclorac or sulfentrazone with this product to increase activity on crabgrass and sedges, respectively. DO NOT apply when temperatures exceed 90° F or if turf is under stress from drought, heat, or disease. Q4 Plus has 0.25 lb ai per gallon more quinclorac than Q4.
thiencarbazon + iodosulfuron + dicamba (Celsius 68WG)	Bahiagrass, Bermudagrass, Centipedegrass, St. Augustinegrass, Zoysiagrass	2.5 to 4.9 oz	See Label	This product is intended for commercial application (licensed applicators only) to residential lawns, commercial lawns, golf courses, sports fields, parks, campsites, recreational areas, residential lawns, roadsides, school grounds, cemeteries, sod farms to control annual and perennial broadleaf weeds and grasses in warm-season grasses. For certain weeds, a second application made two to four weeks later may be needed for complete weed control (see label). Total amount of product applied in a calendar year must not exceed 7.4 oz of product per acre. See label before use. Do not apply to areas with desirable carpetgrass or bahiagrass.
triclopyr (Turflon Ester Ultra) 4.0 lb./gal.	tall fescue, zoysiagrass	1.0 to 2.0 pts.	0.5 to 1.0	Controls wild violet, ground ivy, yellow woodsorrel and selected other broadleaf weeds. Tank mix with recommended rates of Fusilade II or Acclaim Extra to suppress bermudagrass in tall fescue and zoysia. Repeat the application 3 to 4 times at intervals of 4 weeks. Do not apply to other turfgrass species, unless injury can be tolerated. Areas treated with Turflon Ester can be reseeded 3 weeks after application.
triclopyr + clopyralid (Confront) 2.25 + 0.75 lbs./gal.	Ky. bluegrass, bermudagrass, centipedegrass, tall fescue, zoysiagrass	1.0 to 2.0 pts.	0.3 + 0.1 to 0.6 + 0.2	Controls a wide range of broadleaf weeds. Repeat the application in approximately 4 weeks if necessary. Repeat treatments will also be necessary for the control of violets and woodsorrel. Newly seeded turf should be mowed 2 to 3 times before treatment. DO NOT water for 6 hours after application or apply at air temperatures >85°F. DO NOT apply to exposed roots of shallow rooted trees and shrubs. DO NOT reseed for 3 weeks after application. Not labeled for use on residential turfgrasses.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES (continued)				
trifloxysulfuron-sodium (Monument) 75 DG	bermudagrass, zoysiagrass	0.33 to 0.56 oz.	0.015 to 0.026	Controls nutsedge(s), green kyllinga, annual bluegrass, tall fescue, torpedograss and certain broadleaf weeds in established bermudagrass and zoysiagrass. Monument is not recommended for use on other turfgrass species. Not labeled for use on home lawns. Add a nonionic surfactant at 0.25 to 0.5% v/v to the spray mix. Monument at rates of 0.1 to 0.3 oz./acre may be used as a spring transition aid for the removal of perennial ryegrass and <i>Poa trivialis</i> . Avoid mowing for 1 to 2 days before and after application. For nutsedge repeat the application at 4 to 6 weeks if regrowth is observed. DO NOT overseed bermudagrass with cool-season turfgrasses for 3 weeks after application.
TURF RENOVATION				
glyphosate (Roundup Pro) 4 lbs /gal.	Existing vegetation	1.0 to 5.0 qts.	1.0 to 5.0	Apply to areas that are being renovated (establishment of desirable turfgrass) to kill existing vegetation. Refer to Round up Pro label for recommended rates for specific species. Apply to actively growing bermudagrass when seedheads appear. Repeat treatment may be required for complete control. Tillage or renovation techniques (vertical mowing, coring, slicing) should be delayed for 7 days after treatment. Avoid contact of spray with ornamentals.
PREEMERGENCE HERBICIDES - GOLF COURSE PUTTING GREENS				
bensulide (Bensumec) 4LF (Pre-San) 7 G)	bentgrass, bermudagrass	1.9 to 3.1 gals. 107.0 to 180.0 lbs.	7.5 to 12.5 7.5 to 12.5	Controls annual grasses and selected broadleaf weeds. Apply high rate in fall for annual bluegrass control. Apply a light irrigation immediately after treatment. DO NOT apply to newly sprigged grasses. Delay reseeding for 4 months after treatment.
pronamide (Kerb T/O) 50WSP	bermudagrass	1.0 - 2.0	0.5 to 1.0	Preemergence or postemergence applications of Kerb will control annual bluegrass. Apply to non-overseeded bermudagrass greens. Do not apply closer than 90 days before overseeding cool-season grasses unless deactivation with activated charcoal is planned. To deactivate Kerb with activated charcoal, such as Gro-Safe, use 10 lbs. charcoal per 1,000 sq. ft. Reseed no sooner than 7 days after charcoal application. A light overhead irrigation is necessary to move Kerb into the weed root zone if no rainfall occurs within 24 hours. DO NOT apply Kerb to any cool-season turfgrass. Kerb is a Restricted Use Herbicide.
siduron (Tupersan) 50 WP	creeping bentgrass	4.0 to 24 lbs.	2.0 to 12.0	May be applied at the time of seeding or to established creeping bentgrass for crabgrass spp. control. Siduron does not control goosegrass or annual bluegrass. Irrigate within 3 days of application with ½ inch of water/acre if rainfall does not occur. Tupersan at 1.0 lb. product per 1,000 sq. ft. may be used as band treatment along the perimeter of creeping bentgrass putting greens to suppress stolon growth of bermudagrass. Make the initial application in the March/April time frame. Repeat applications can be made at 4 to 5 week intervals.
fenarimol (Rubigan) 1AS (Patchwork) 0.78G	overseeded bermudagrass	See Label See Label	See Label See Label	Fenarimol is a systemic fungicide that reduces the infestation level of annual bluegrass. May be applied as a sequential treatment to bermudagrass greens that are overseeded with perennial ryegrass, <i>Poa trivialis</i> or bentgrass. Sequential treatments should be applied at intervals of 10 to 14 days. Use the triple application program if bentgrass or <i>Poa trivialis</i> is used for overseeding. For double applications, apply 6.0 fl. ozs. of Rubigan AS or 6.0 lbs. of Patchwork per 1,000 sq. ft. with the last application 2 weeks prior to overseeding ryegrass. For triple applications, apply 4.0 fl. ozs. of Rubigan AS or 4.0 lbs. Patchwork per 1,000 sq. ft. with the last application 2 weeks prior to overseeding ryegrass or 4 weeks prior to overseeding bentgrass or <i>Poa trivialis</i> . A single application of Rubigan AS at 2.0 fl. ozs. or Patchwork at 2.0 lbs. per 1,000 sq. ft. in January or February will help to maintain annual bluegrass control. Rubigan will not control perennial bluegrass.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
PREEMERGENCE HERBICIDES - GOLF COURSE PUTTING GREENS (continued)				
bensulide + oxadiazon (Goosegrass/Crabgrass Control) 5.25% + 1.31% G	bentgrass, bermudagrass	115.0 lbs.	6.0 bensulide + 1.5 oxadiazon	Controls summer annual grasses. Apply a light irrigation after treatment. DO NOT use on newly sprigged grasses until well established. Delay reseeding for 5 months after treatment. On putting greens overseeded with perennial ryegrass or <i>Poa trivialis</i> apply ½ the maximum labeled rate to dry turf. Apply an additional application at ½ the maximum labeled rate to dry turf 10 to 14 days later. See label for precautions concerning use on putting greens.
POSTEMERGENCE HERBICIDES - GOLF COURSE PUTTING GREENS				
carfentrazone (QuickSilver) 1.9 lbs./gal. (QuickSilver) 1.03 lb./gal. (water-soluble 5 ml bag)	bentgrass	6.7 fl. ozs. use 3 to 4 5 ml bags / 2,000 sq. ft.	0.1	Apply to creeping bentgrass putting greens and tees for the control of silvery-thread moss (<i>Byrum argenteum</i>). Repeat the application in 2 weeks. Add a nonionic surfactant at 0.25% v/v. Apply at a spray volume of > 100 gpa. Transitory injury (yellowing) may occur when applied to bentgrass stressed from high air temperatures (>90°F.), disease and soil moisture stress.
diclofop-methyl (Illoxan) 3EC	bermudagrass	1.0 to 1.4 qts.	0.75 to 1.0	Illoxan may be used for goosegrass control on bermudagrass golf greens, tees and fairways. Use the high rate for goosegrass with one to two tillers. Lower rates may be used on smaller goosegrass. DO NOT mow for 24 to 36 hours after application. Control requires 2 to 3 weeks. May cause temporary phytotoxicity (7 to 10 days). DO NOT tank mix with other pesticides or fertilizers as control will be reduced. DO NOT overseed treated areas for at least 2 months after the last application.
foramsulfuron (Revolver) 0.19 lbs./gal.	bermudagrass	8.8 to 26.2 fl. ozs.	0.013 to 0.04	Apply Revolver for: a) control of emerged annual bluegrass 1 week before overseeding bermudagrass with perennial ryegrass, b) postemergence control of goosegrass in late spring and early summer, c) postemergence control of annual bluegrass in non-overseeded putting greens, and d) spring transition of bermudagrass overseeded the previous fall with cool-season turfgrasses. For tillered goosegrass, make 2 applications at the high rate 7 to 14 days apart. DO NOT apply Revolver within 2 weeks of sprigging. Revolver is rainfast within 2 hours of application. Revolver must be allowed to dry on bermudagrass foliage before traffic is allowed through treated areas. Revolver is NOT recommended for use on creeping bentgrass greens.
mecoprop (MCP-4 Amine)	bentgrass, bermudagrass	2.5 pts.	1.25	Apply to small and actively growing broadleaf weeds as a summer or winter treatment. Avoid spray drift to ornamentals tree, shrub or flower foliage. DO NOT water for 24 hours after application. Delay mowing 2 to 3 days before or after application. DO NOT apply during conditions of drought, high temperatures (>90° F.) or very wet weather. Weekly applications at one-half recommended rates will provide better control of knotweed than a single application at normal use rates. DO NOT reseed for 3 to 4 weeks after application.
rimsulfuron (Tran Xit GTA) 25DF	bermudagrass	1.0 to 2.0 ozs.	0.016 to 0.032	May be used: a) to control annual bluegrass before overseeding bermudagrass with perennial ryegrass or <i>Poa trivialis</i> ; b) to control annual bluegrass in non-overseeded bermudagrass, and c) to remove perennial ryegrass or <i>Poa trivialis</i> from bermudagrass greens in the late spring. Add a nonionic surfactant at 0.25% v/v. Apply 10 to 14 days in late summer or early fall before overseeding bermudagrass. DO NOT apply after overseeding, or to bentgrass putting greens. To hasten spring transition on overseeded bermudagrass, apply at the 60 to 75% green-up growth stage of bermudagrass, or approximately 2 to 3 weeks before transition is desired. Irrigate within 2 hours of a TranXit application and then follow normal irrigation schedule. TranXit is NOT recommended for use on creeping bentgrass putting greens.

TURFGRASS WEED CONTROL FOR PROFESSIONAL MANAGERS (continued)

Use Stage and Herbicide	Turfgrasses	Broadcast Rate / Acre		Remarks and Precautions
		Amount of Formulation	Lbs. Active Ingredient	
POSTEMERGENCE HERBICIDES - GOLF COURSE PUTTING GREENS (continued)				
MCP + 2,4-D + dicamba (Trimec Bentgrass)	bentgrass	2.7 pts.	0.5 + 0.15 + 0.06	Apply to small and actively-growing broadleaf weeds when air temperatures are less than 80°F. DO NOT water for 24 hours after application. DO NOT apply if bentgrass is showing the effects of environmental stresses.
trifloxysulfuron-sodium (Monument) 75 DG	bermudagrass	0.33 to 0.56 oz.	0.015 to 0.026	Controls nutsedge(s), annual sedges, kyllinga species, and certain broadleaf weeds in established bermudagrass putting greens. Applications should be made to actively-growing bermudagrass after 100% spring green-up. Monument is not recommended for use on creeping bentgrass. Add a nonionic surfactant at 0.25 to 0.5% v/v to the spray mix. Monument at rates of 0.1 to 0.3 oz./ac re may be used as a spring transition aid for the removal of perennial ryegrass and <i>Poa trivialis</i> . Avoid mowing for 1 to 2 days before and after application. For nutsedge repeat the application at 4 to 6 weeks if regrowth is observed. DO NOT overseed bermudagrass with cool-season turfgrasses for 3 weeks after application.
sulfosulfuron (Certainty) 75WDG	Bermudagrass Centipedegrass Seashore Paspalum St. Augustinegrass Zoysiagrass	0.75 to 2 oz	0.04 to 0.09	Sulfosulfuron controls nutsedge(s), annual sedges, kyllinga species, tall fescue, and certain broadleaf weeds in warm-season turfgrasses. Add a nonionic surfactant at 0.25% v/v to the spray mix. Avoid mowing for 1 to 2 days before and after application. For nutsedge repeat the application at 4 to 10 weeks if regrowth is observed. Sulfosulfuron may be applied 7 to 10 days before overseeding bermudagrass with perennial ryegrass. DO NOT use on putting greens. DO NOT use on tall fescue or other cool-season grasses.

TURFGRASS GROWTH REGULATORS FOR PROFESSIONAL MANAGERS

Patrick E. McCullough, Extension Agronomist-Weed Science

CHEMICAL	TURFGRASSES	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
		AMOUNT OF FORMULATION	LBS. ACTIVE INGREDIENT	
mefluidide (Embark) 2S	Ky. bluegrass, centipede, tall fescue, common bermudagrass	1.5 - 4.0 pts.	0.38 - 1.0	Use the low rate on Ky. bluegrass, centipede and tall fescue. Use the high rate on common bermudagrass. Mowing 3 weeks after application to centipede will extend the period of seedhead suppression. Apply after uniform spring green-up but prior to seedhead emergence. Suppresses vegetative and seedhead development. Recommended for turfgrasses on difficult-to-mow sites. Not recommended for turfgrasses when maintained under intensive management systems. <u>DO NOT</u> mow two days prior to or after application. Remove clippings prior to application. The addition of a nonionic surfactant (0.25% v/v) may enhance suppression; however, temporary discoloration may increase. <u>DO NOT</u> apply within 4 growing months of seeding or reseed within 3 days of an application. Embark requires an 8-hour rain-free period for optimum activity.
maleic hydrazide (Retard) 2.25 lb./gal.	bahiagrass, Ky. bluegrass, Tall fescue, Common bermudagrass	1.3 gal.	3	Apply after uniform spring green-up but prior to seedhead emergence. Suppresses vegetative growth and seedhead development. If seedheads have already formed, mow 1 week after application to remove emerged seedheads. Recommended for turfgrasses on difficult-to-mow sites. Not recommended for turfgrasses when maintained under intensive management systems. Remove clippings prior to application. <u>DO NOT</u> apply to turf less than 3 years old and delay reseeding for 3 days. <u>DO NOT</u> add a surfactant. Maleic hydrazide requires a 12-hour rain-free period for optimum activity.
paclobutrazol (Trimmit) 2SC	hybrid bermudagrass, St. Augustinegrass	See label.	See label.	Recommended for hybrid bermudagrass golf course fairways, tees and roughs, and St. Augustinegrass. Apply in spring after uniform green-up. Do not seed within 6 weeks prior to or 2 weeks after application. Do not aerify or drag greens with steel mats while under growth regulation effects. Not recommended for use on common bermudagrass. <u>DO NOT</u> sprig within 4 weeks of application. On newly sprigged or sodded turf delay application until the sod has firmly rooted or sprigs have achieved complete soil coverage.
flurprimidol (Cutless) 50W	bermudagrass, (Tift 419, 328 and common), zoysiagrass	See label.	See label.	Cutless may be used on medium to high quality, well maintained turfgrasses. Refer to label for rates for different bermudagrass cultivars and zoysiagrass. Apply after full spring green-up (usually mid-May to mid-June) for the first application. An additional application may be made in the late summer to bermudagrasses only. Treated areas should receive 0.5 inch of rainfall or irrigation within 24 hours of application. Make uniform application with a boom-type sprayer and avoid overlaps.
trinexapac-ethyl (Governor) (Groom PGR) 1 MC (Primo) 1MC (Primo) 25 WSB (T-Nex) 1 AQ	bahiagrass, Ky. Bluegrass, bermudagrass, centipedegrass, tall fescue, St. Augustinegrass, zoysiagrass bentgrass putting greens, bermudagrass putting greens	See label	See label	Apply to actively-growing turfgrasses. The rate of application is dependent upon turfgrass species and desired length of growth suppression. Refer to the label for additional information. Repeat applications may be made as soon as the treated turfgrass resumes growth. Trinexapac-ethyl is foliage-absorbed and is rainfast within one hour of application. Trinexapac-ethyl does not require the addition of a surfactant. Trinexapac-ethyl may cause temporary yellowing (about one week). Trinexapac-ethyl is labeled for use on home lawns, commercial lawns, golf courses, golf course putting greens, sod farms, athletic fields, cemeteries and other similar areas. Additionally, trinexapac-ethyl may be applied to bermudagrass to enhance establishment of cool-season turfgrasses (overseeding). Apply before verticutting, scalping, spiking or other similar operations. Apply 1 to 5 days before overseeding. Trinexapac-ethyl may also be used for growth regulation of grasses around monuments and structural materials. At normal dilution rates, trinexapac-ethyl does not stain brass, bronze, concrete, marble, granite and other types of stone.

TURFGRASS GROWTH REGULATORS FOR PROFESSIONAL MANAGERS (continued)

CHEMICAL	TURFGRASSES	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
		AMOUNT OF FORMULATION	LBS. ACTIVE INGREDIENT	
flurprimidol + trinexapac-ethyl (Legacy) 1.1 + 0.41 lb/gal	Bentgrass, KY bluegrass, perennial ryegrass, bermudagrass, seashore paspalum, zoysiagrass	See Label	See Label	Flurprimidol + trinexapac-ethyl (Legacy) can be applied to actively growing turf for clipping management and annual bluegrass suppression. Apply Legacy for annual bluegrass suppression in fairway height bentgrass at 8 to 15 fl. oz./acre in early spring upon active turfgrass growth. Repeat applications of 8 to 20 fl. oz./acre of Legacy should be made at 3 to 6 week intervals until late summer or early fall. Apply 15 to 25 fl. oz./acre for annual bluegrass suppression in Kentucky bluegrass and perennial ryegrass mixtures mowed at fairway heights. Reduced rates of Legacy should be considered in bentgrass fairways with high populations of annual bluegrass or when temporary annual bluegrass discoloration cannot be tolerated. For both warm and cool-season grasses, applications should be discontinued a minimum of 4 weeks before the onset of inactive growth or winter dormancy.
flurprimidol (Cutless 50W)	bentgrass putting greens	0.25 - 0.5 lbs.	0.125 - 0.25	Apply to actively growing bentgrass putting greens to suppress annual bluegrass. Apply in the spring after 3 to 4 mowings or in the fall. If necessary, repeat the application at 3 to 6 week intervals. <u>DO NOT</u> exceed 2.0 lbs. ai/acre per growing season. Make the final fall application 8 weeks before the onset of winter dormancy. Delay reseeding for 2 weeks after application.
paclobutrazol (Trimmit) 2SC	bentgrass and bermudagrass putting greens	6.4 - 16.0 fl. ozs.	0.1 - 0.25	Used on creeping bentgrass greens to suppress annual bluegrass. Apply in the spring at least one month before the onset of high air temperatures. Repeat applications can be made at 4 to 6 week intervals. For late summer and early fall applications, apply Trimmit at least one month before hard frost. Do not use on bermudagrass greens except for winter overseeding enhancement (see Label).

TURFGRASS WEED RESPONSE TO HERBICIDES

	atrazine	benfen	bensulide	dithiopyr	dimethenamid	ethofumesate	indaziflam	mesotrione	oryzalin	oxadiazon	pendimethalin	proflumicafone
Time of application	PREEMERGENCE											
PERENNIAL WEEDS												
bahiagrass	F	P	P	P	P	P			P	P	P	P
bermudagrass	P	P	P	P	P	P-G		P	P	P	P	P
dallisgrass	P	P	P	P	P	P		P	P	P	P	P
nutsedge, purple	P	P	P	P	P	P		P	P	P	P	P
nutsedge, yellow	P	P	P	P	F	P		F	P	P	P	P
tall fescue	F	P	P	P	P	F			P	P	P	P
wild garlic/onion	P	P	P	P	P	P			P	P	P	P
ANNUAL GRASSES												
annual bluegrass	E	E	F	G	F	G-E	E	P	G	G	G	E
crabgrass	F	E	E	G-E	F	P	G-E	F	E	E	E	E
crowfootgrass		G	G			P		G	G	G	G	
goosegrass	P	F	F	F	G	P	G-E		F-G	E	F-G	G
sandbur		F	G			P			G	F	G	
BROADLEAF WEEDS												
carpetweed	E			G-E				E	G-E	G-E	G-E	G-E
chamberbitter (niruri)	G				G							
common chick weed	E	G	P	G	G		E	G	G	P	G	G
corn speedwell	E	E	P	G						G	E	
cudweed	E	P							P	P	P	
dandelion	F	P	P	P					P	P	P	P
dichondra	F	P	P	P					P	P	P	P
docks	G	P	P	P					P	P	P	P
doveweed	G	P	P		G	P			P	P	P	
Florida betony	E	P	P						P	P	P	
ground ivy		P	P	P					P	P	P	P
henbit	E	G	P	G	G				G	P	G	G
hop clovers	E	P	P		G			G-E		G		
knotweed	E		G		G				F	G		
lespedeza	E						F-G					
mallow, bristly		P	P	P					P	P	P	P
mock strawberry		P	P	P					P	P	P	P
mouseear chickweed		E	P		G			G	P	P	G	
mugwort		P	P	P					P	P	P	P
mustards	E		G							E		
parsley piert	E	P	E							G	P	
pennywort	F	P	P		G				P	P	P	
plantains	G	P	P	P					P	P	P	P
purslane, common	G			G				G-E		G	G	G
spurges	E	P	P	G	G					P	F	
spurweed (burweed)	E	P	P	P					F	P	G	P
VA buttonweed		P	P	P					P	P	P	P
violets		P	P	P					P	P	P	P
white clover	E	P	P	P	G		G	G-E	P	P	P	P
yellow woodsorrel	E	P	P	P	G				F	G	F	P

Key to response symbols: E = Excellent control (90 to 100 %), G = Good control (80 to 89%), F = Fair control (70 to 79%), P = Poor control (< 70%).

A blank space indicates weed response is not known.

TURFGRASS WEED RESPONSE TO HERBICIDES (continued)

	pronamide	simazine	atrazine	bentazon	bromoxynil	2,4-D	2,4-D + 2,4-DP	2,4-D + MCPP + dicamba	triclopyr
Time of application	PREEMERGENCE		POSTEMERGENCE						
PERENNIAL WEEDS									
bahiagrass	P	P	P-F	P	P	P	P	P	P
bermudagrass	P	P	P	P	P	P	P	P	P
dallisgrass	P	P	P	P	P	P	P	P	P
nutsedge, purple	P	P	P	P	P	F	P	P	P
nutsedge, yellow	P	P	P	G	P	F	P	P	P
tall fescue	G	F	F	P	P	P	P	P	P
wild garlic/onion	P	P	P	P	P	G	G	G	P
ANNUAL GRASSES									
annual bluegrass	E	E	E	P	P	P	P	P	P
crabgrass	F	F	F	P	P	P	P	P	P
crowfootgrass			P	P	P	P	P	P	P
goosegrass	P	P	P	P	P	P	P	P	P
sandbur			F	P	P	P	P	P	P
BROADLEAF WEEDS									
carpetweed	G	G-E	G-E			G	G-E	G-E	G
chamberbitter (niruri)			G	P		P			
common chick weed	E	E	E	G	P	P	G	G	E
corn speedwell	G	G	E	P	G	F	F	F	G
cudweed	P		G		G	G-E	G-E	E	F
dandelion	P	P	F	P	P	E	G	G	G
dichondra	P	P	F	P	P	G	G	G	F-G
docks	P	P	G	P		F	F	G	F-G
doveweed	P	G	G-E	P	P	F	F	F-G	F
Florida betony	P	P	F-G	P	P	F	G	G	G
ground ivy	P	P		P	P	P-F	F	F	G
henbit	P	E	E	P	G	P	G	G	E
hop clovers	P	E	E		F	F	E	G	E
knotweed		G	E		F	P	F	G	F
lespedeza		E	E			P-F	G	G	G
mallow, bristly	P	P		P		F	F-G	F-G	G
mock strawberry	P	P		P		P	P	G	
mouseear chickweed	G		G	P		P-F	G	G	G
mugwort	P	P		P		P	F	P-F	P-F
mustards			E	G	G	E	G	G	F
parsley piert	P	G	E	G	G	P	P	F	E
pennywort	P	P	F	P	P	G	G	G	F
plantains	P	P	F	P	P	E	G	G	F
purslane, common		G	G	G-E		G	G	G-E	G
spurges		G	E	P	F	F	G	G	F
spurweed (burweed)	P	E	E	E	G	G	E	G	F
VA buttonweed	P	P	P	P	G	P	P	P	P
violets	P	P		P		P	P-F	P-F	F-G
white clover	P	G	E	P		F	G	G	F-G
yellow woodsorrel	P	P	G	P	F	P	P-F	F	F

Key to response symbols: E = Excellent control (90 to 100 %), G = Good control (80 to 89%), F = Fair control (70 to 79%), P = Poor control (< 70%).

A blank space indicates weed response is not known.

TURFGRASS WEED RESPONSE TO HERBICIDES (continued)

	dicamba	fenoxaprop	glypho-sate	imazaquin	MCPP	MSMA DSMA	metribuzin	pronamide	sethoxydim	simazine	Thiencarbazone + iodosulfuron + dicamba
Time of application	POSTEMERGENCE										
PERENNIAL WEEDS											
bahiagrass	P	G	G	P	P	F	P	P	F	P	F
bermudagrass	P	F-G	E	P	P	P	P	P	F	P	P
dallisgrass	P	P	E	P	P	F-G	P	P	P	P	F
nutsedge, purple	P	P	G	G	P	F	P	P	P	P	P
nutsedge, yellow	P	P	E	F-G	P	F	P	P	P	P	P
tall fescue	P	P	E	P-F	P	P	F	E	P-F	F	P
wild garlic/onion	F	P	G	E	P	P	P	P	P	P	
ANNUAL GRASSES											
annual bluegrass	P	P	E	P-F	P	P	G	E	P	G-E	P
crabgrass	P	G-E	E	P	P	E	F	P	E	P	P
crowfootgrass	P	G-E	E	P	P	E	G	P	F-G	P	
goosegrass	P	G-E	E	P	P	F	G	P	G	P	P
sandbur	P	G	E	F	P	G	G	P	G	P	
BROADLEAF WEEDS											
carpetweed	E	P	E		F		G-E		P		
chamberbitter (niruri)		P	E	P		P-F			P		
common chick weed	E	P	E	E	G	P	G	G	P	E	E
corn speedwell	F	P	E	P	P	P	E	G	P	E	E
cudweed	E	P	G	F		F-G			P		G-E
dandelion	E	P	E		E	P		P	P	P	
dichondra	G	P	E		F	P		P	P	P	
docks	E	P	E		P	P		P	P	P	
doveweed	P	P	G				F	P	P	P	
Florida betony	G	P	E		G	P		P	P	P	
ground ivy	G	P	G		F	P		P	P	P	
henbit	E	P	E	G	G	P	G	P	P	E	E
hop clovers	E	P	E		E	P	G		P	E	E
knotweed	E	P	E		F	P	G		P		
lespedeza	E	P	E		G	P	E		P		F
mallow, bristly	E	P				P		P	P	P	
mock strawberry	G	P				P		P	P	P	
mouseear chickweed	E	P	E	G	G	P	E	P	P	P	
mugwort	P-F	P	G		P	P		P	P	P	
mustards	E	P	E		F	P	F	P	P	G	
parsley piert	E	P	E	G	F	P	E	P	P	E	E
pennywort	E	P	E		E	P		P	P	P	
plantains	F	P	E		F	P		P	P	P	
purslane, common	G	P	F		F				P	P	
spurges	G	P	E		F	P	E		P		
spurweed (burweed)	E	P	E	E	F	P	G	P	P	E	
Star-of-Bethlehem	P	P	F	P	P	P	P	P	P	P	
VA buttonweed	F	P	G		P	P		P	P	P	G-E
violets	F	P			P	P		P	P	P	
white clover	E	P	F	F	E	P	F	P	P	P	E
yellow woodsorrel	G	P	E		F	G		P	P	P	

Key to response symbols: E = Excellent control (90 to 100 %), G = Good control (80 to 89%), F = Fair control (70 to 79%), P = Poor control (< 70%).

A blank space indicates weed response is not known.

TURFGRASS WEED RESPONSE TO HERBICIDES (continued)

	isoxaben	metasulfuron	clopyralid	fluroxypyr	triclopyr + clopyralid	clethodim	diclofop
Time of application	PRE	POSTEMERGENCE					
PERENNIAL WEEDS							
bahiagrass	P	G-E	P	P	P		P
bermudagrass	P	P	P	P	P	G	P
dallisgrass	P	P	P	P	P		P
nutsedge, purple	P	P	P	P	P	P	P
nutsedge, yellow	P	P	P	P	P	P	P
tall fescue	P	P	P	P	P		P
wild garlic/onion	P	E	P			P	P
ANNUAL GRASSES							
annual bluegrass	P	P	P	P	P	F	P
crabgrass	P	P	P	P	P	E	P
crowfootgrass		P	P	P	P	E	
goosegrass	P	P	P	P	P	G-E	G-E
sandbur	P	P	P	P	P	G	P
BROADLEAF WEEDS							
carpetweed	G-E	P			P	P	P
chamberbitter (niruri)	G-E		P			P	P
common chick weed	E	E	P	G	E	P	P
corn speedwell	G	E			P	P	P
cudweed	F	E	E		G-E	P	P
dandelion	P	E	F	F-G	E	P	P
dichondra	P	P			E	P	P
docks	P	E	G		E	P	P
doveweed		P	P		P	P	P
Florida betony		G-E	P		G	P	P
ground ivy	P			G	G-E	P	P
henbit	E	G		F-G	E	P	P
hop clovers		P-F	E	G	E	P	P
knotweed	G	E		G		P	P
lespedeza		E	P		E	P	P
mallow, bristly	P	G				P	P
mock strawberry	P					P	P
mouseear chickweed	G	E	P	G	E	P	P
mugwort	P		G			P	P
mustards		F	P			P	P
parsley piert	E		P			P	P
pennywort		G			E	P	P
plantains		G		F-G	E	P	P
purslane, common	E	F-G				P	P
spurges	E	E			F-G	P	P
spurweed (burweed)	G	E	E		E	P	P
star-of-Bethlehem	P	P	P		P	P	P
VA buttonweed	P	F		F	F	P	P
violets	P	G-E			F-G	P	P
white clover	P	E	E	G-E	E	P	P
yellow woodsorrel	G	G		G	F-G	P	P

Key to response symbols: E = Excellent control (90 to 100 %), G = Good control (80 to 89%), F = Fair control (70 to 79%), P = Poor control (< 70%). A blank space indicates weed response is not known.

TURFGRASS WEED RESPONSE TO HERBICIDES (continued)

	foramsulfuron	flazasulfuron	trifloxysulfuron sodium	carfentrazone	rimsulfuron	halosulfuron	sulfentrazone	sulfosulfuron
Time of application	POSTEMERGENCE							
PERENNIAL WEEDS								
bahiagrass	P		F	P		P	P	P
bermudagrass	P	P	P	P	P	P	P	P
dallisgrass	F ¹	P	P-F	P	P	P	P	
nutsedge, purple	P	E	E	P		G-E	P-F	G-E
nutsedge, yellow	P	E	E	P		G-E	E	G-E
tall fescue	G-E	G-E	G-E	P	G	P	P	G
wild garlic/onion			G-E	P		P	F	P-F
ANNUAL GRASSES								
annual bluegrass	E	G-E	E	P	E		P	F-G
crabgrass	P	P-F	P-F	P	P		P	
crowfootgrass	P		P	P			P	
goosegrass	G	P	P	P	P		P	
sandbur	P		P	P			P	
BROADLEAF WEEDS								
carpetweed			F-G	G-E			G	
chamberbitter (niruri)								
common chick weed		E		G	G		G	E
corn speedwell				G			G	P
cudweed		G	G					
dandelion		E	E	G			P	P
dichondra		P	E					
docks						G		
doveweed								
Florida betony	E		E	P-F				
ground ivy			F-G	G			F	
henbit	E		E	G	G		G	P
hop clovers	F	E	G				G	
knotweed	P						G	
lespedeza							P	
mallow, bristly			P					
mock strawberry								
mouseear chickweed							G	
mugwort								
mustards								G-E
parsley piert			G-E				G	
pennywort			G					
plantains		F-G	P				G	
purslane, common				F				
spurges		F-G	E	F	G-E		E	
spurweed (burweed)	P		E				G	G-E
star-of-Bethlehem				G-E			G-E	
VA buttonweed			F-G					F-G
violets			G				P	
white clover	F	E	G				P	G-E
yellow woodsorrel			E				G	

Key to response symbols: E = Excellent control (90 to 100 %), G = Good control (80 to 89%), F = Fair control (70 to 79%), P = Poor control (< 70%).

A blank space indicates weed response is not known.

¹ Apply as tank-mix with or in a sequential program with MSMA to improve dallisgrass control.