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PB1789 Weed Control Manual for Turf Managers in Tennessee

James T. Brosnan

Greg Breeden

Tom Samples

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"PB1789 Weed Control Manual for Turf Managers in Tennessee," James T. Brosnan, Greg Breeden, and Tom Samples,
PB1789
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Extension

PB 1789

Weed Control Manual for Turf Managers in Tennessee

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Weed Control Manual for Turf Managers in Tennessee

Athletic Fields, Golf Courses, Sod Farms, Residential and Non-residential Turfgrass

James T. Brosnan, Assistant Professor – Turfgrass Weed Science

Greg Breeden, Weed Science Extension Assistant

*Tom Samples, Professor – Turfgrass Science & Management
Plant Sciences*

This manual is prepared to assist turfgrass managers with developing effective weed management programs. This manual contains herbicide recommendations that are subject to change at any time. The recommendations in this manual are provided only as a guide. The use of brand or trade names is for clarity and information, and does not imply the endorsement of a product to the exclusion of others that may be of a similar, suitable composition. It does not guarantee or warrant the standard of a product.

Herbicide labels are constantly reviewed and revised. Listed herbicides were registered for the prescribed use when this manual was printed. Should the registration or prescribed use of a herbicide be canceled prior to revision of this publication, the herbicide would no longer be recommended by the University of Tennessee. Up-to-date information on herbicide efficacy is posted regularly at <http://www.tennesseeturfgrassweeds.org>.

Herbicides must be used in strict accordance with the product label – to do otherwise is a violation of federal law. Always read and understand product label directions and precautions before selecting, purchasing, transporting, storing and applying a herbicide. Any discrepancy in this manual with a product label is unintentional. If such a discrepancy exists within this manual, in all cases, use the product label as the authority to guide you in the legal use of the product.

Preventative Weed Management

The best approach to minimizing turfgrass weed problems is to maintain a dense, vigorous, high-quality turf. Implementing proper cultural practices such as mowing, fertility and irrigation to maximize turfgrass quality reduces the likelihood of weed encroachment by preventing the development of voids in the canopy in which weeds become established.

The following Extension publications contain more information on proper turfgrass selection, establishment and maintenance in Tennessee. More information on this subject can also be found at <http://www.tennessee-turf.utk.edu>

Additional turf resources from UT Extension:

(Those marked "W" are on-line only, at utextension.tennessee.edu)

W146	Crabgrass Species Control in Turfgrass	W242	Brush Control in Urban Landscapes
W147	Virginia Buttonweed	SP290-L	Sod Webworms on Turfgrass
W170	Goosegrass	SP634	Management of Turfs Based on Location and Use in Public Gardens
W192	Why Will My Weed Problem Not Go Away?	SP642	Dallisgrass
W203	Annual Bluegrass Control on Non-Overseeded Bermudagrass Athletic Fields	SP651	Costs of Managing a Bermudagrass Football Field in Tennessee
W204	Annual Bluegrass Control in Overseeded Bermudagrass Turf	PB842	Turfgrass Diseases and Their Control
W205	Controlling Winter Annual Broadleaf Weeds	PB1038	Lawn Fertilization and Management
W212	Wild Garlic	PB1061	Soil Testing
W216	Star-of-Bethlehem	PB1096	Liming Acid Soils in Tennessee
W218	Trade Names of Herbicides Labeled for Use in Turf	PB1333	Algae and Mosses in Turfgrasses
W222	EPA Decision on the Use of Organic Herbicides for Weed Management	PB1342	Commercial Turfgrass Insect Control
W230	Bushkiller	PB1350	Turfgrass Seed
W231	English Ivy	PB1632	Bermudagrass Athletic Field Management Calendar
W232	Mimosa	PB1649	Commercial Tall Fescue-Kentucky Bluegrass Sod Production in Tennessee
W233	Privet	PB1775	Common Commercial Pre-packaged Herbicide Mixtures
W237	Bermudagrass Control in Tall Fescue and Zoysiagrass		
W238	Weed Control during the Seeded Establishment of Cool-season Turfgrasses		
W239	Removing Overseeded Perennial Ryegrass from Bermudagrass Turf		

Calibration of Herbicide Application Equipment

Two types of herbicide applications are commonly made to turfgrasses. Broadcast applications are designed to apply a uniform concentration of herbicide to a large area infested with weeds. Both granular and liquid herbicides can be broadcast-applied. Conversely, spot treatments apply a volume of herbicide to an individual weed or small localized area where weeds are present. Application rates for spot treatments are usually listed on the label in units of product per gallon of carrier rather than units of product per acre or 1000 ft². In order to apply a uniform concentration of herbicide as either a broadcast application or spot treatment, application equipment must be properly calibrated.

See the following Extension publications for more information on herbicide calibration or visit <http://www.tennesseeurf.utk.edu>

SP 268-G Calibrating Fertilizer Spreaders for Lawns and Gardens

PB1276 A Guide to Proper Sprayer Calibration

W236 Calibrating a Pull-behind, Two-nozzle-boom Turf Sprayer

Preemergence Herbicide Options

The following table lists preemergence (PRE) herbicides for controlling annual grassy weeds like crabgrass, goosegrass and annual bluegrass. These herbicides may also have activity on other grassy and broadleaf weeds arising from seed. Please refer to the weed susceptibility tables to choose the appropriate herbicide. Herbicide selection and application timing influence the control of weeds.

PRE herbicides act by preventing seedlings from developing and not by inhibiting actual seed germination. To be effective, these herbicides must be applied prior to seedling emergence. For optimum weed control, PRE herbicides need ½ inch of rainfall or irrigation within 24 to 48 hours after application. Lack of a timely rain or irrigation may result in poor weed control. Always refer to the product label for specific information on proper herbicide use, tank-mix compatibility and turfgrass tolerance. The omission of a particular trade name is not intended to reflect adversely, or to show bias against, any product or trade name not mentioned. Often pre-mixed combination products (two or more active ingredients) containing the same active ingredients can have different trade names. Tank-mixing more than one chemical may improve efficacy, as will making sequential applications of a single chemical. These strategies may result in undesirable turfgrass injury. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science Web site, <http://tennesseeturfgrassweeds.org>

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
atrazine (AAtrex 4L and 90DF)	1-2 lb.	See Label	See Label	Bermudagrass (Dormant) Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> • RESTRICTED-USE PESTICIDE. • Provides PRE and early post control of annual bluegrass and PRE control of certain broadleaf weeds. • Do not apply more than 1 lb ai/A in a single application or more than 2 lb ai/A per year. • Apply only the 1 lb ai/A rate to newly sprigged turfgrass. • Do not apply to newly seeded bermudagrass or zoysiagrass until it has developed a strong rhizome system and has over-wintered. • To control winter annual weeds, apply after Oct. 1st to non-overseeded turfgrass stands. A second application can be made at least 30 days after the initial application (before April 15th). • Do not over-seed treated areas within 4 months before or 6 months after application. • Do not use on golf greens.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
benefin (Balan 2.5G)	1.5-3 lb.	60-120 lb.	1.38-2.75 lb.	Bermudagrass Centipedegrass Fine Fescue Ky. Bluegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Provides PRE control of certain annual grassy weeds. • Use up to 2 lb ai/A on cool-season turf stands and up to 3 lb ai/A on warm-season stands. • Do not apply to creeping bentgrass. • Not labeled for use on golf greens, regardless of species. • Should not be applied in the spring to turfgrass seeded the previous fall. • Do not seed into treated areas within 4 months of last application. • May thin cool-season species over-seeded into warm-season stands. • Do not use on newly sprigged turfgrass. • For summer annual grassy weed control, make a second application 4 to 6 weeks after initial application. • Apply ½ inch of irrigation within 24-48 hours after any application.
benefin + oryzalin (XL 2G)	2-3 lb.	100-150 lb.	2.3-3.4 lb.	Bermudagrass Centipedegrass Tall Fescue Zoysiagrass	
benefin + trifluralin (Team 2G)	1.5-3 lb.	75-150 lb.	1.7-3.4 lb.	Bermudagrass Centipedegrass Creeping Bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
bensulide (Bensumec 4LF)	7.6-12.4 lb.	1.9-3.1 gal.	5.6-9.1 fl.oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> Provides PRE control of certain annual grassy weeds. Labeled for use on golf courses and residential lawns only. No more than 2 applications can be made to golf greens or tees in a single year. No more than 50 pt/A can be applied per year. Safe for use on creeping bentgrass putting greens. Do not use on bermudagrass putting greens. Do not apply in the spring to turfgrass seeded the previous fall. Do not seed into treated areas within 4 months of last application. Do not use on newly sprigged turfgrass. For summer annual grassy weed control, make second application 8 to 12 weeks after initial application. Apply ½ inch of irrigation within 24-48 hours after any application. Granular formulation sold under the trade name Pre-San.
dithiopyr (Dimension 1EC, 40WP, 2EW, others)	0.38-0.5 lb.	See Label	See Label	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> Provides PRE and early Post control of crabgrass (up to tillering). Post activity is improved with addition of a non-ionic surfactant (0.5 %v/v). Apply to well-established turfgrasses that have received at least 2 mowings. See label for variety susceptibility. The EC formulation doesn't restrict use on putting greens; all other formulations restrict greens applications. The potential for undesirable injury with applications of the EC formulation to golf greens is significant. Do not re-seed within 4 months of last application. Bermudagrass can be over-seeded with perennial ryegrass 8 weeks after the last application. For summer annual grassy weed control, make second application 5 to 10 weeks after initial application. Apply ½ inch of irrigation within 24-48 hours after any application.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
dimethenamid-P (Tower 6EC)	0.98-1.5 lb.	21-32 fl.oz.	0.48-0.73 fl.oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Provides PRE control of certain annual grassy weeds, broadleaves and yellow nutsedge. • Labeled for use on golf courses only. • Do not apply more than 64 fl oz/A of product per year • Safe for use on creeping bentgrass and annual bluegrass maintained at ½ inch or higher. • Do not apply to golf greens. • Do not apply in situations that favor runoff. • On newly planted areas, do not apply until turfgrass has filled in and has been mowed at least 4 times. • Delay reseeding or winter overseeding of treated turfgrass for at least 1 month following application. • Delay sprigging turfgrass into treated areas for 2 months after application. • For summer annual grassy weed control, make second application 5 to 8 weeks after initial application. • Long-term efficacy will be improved if applied in mixtures with other PRE herbicides labeled for annual grassy weed control. • Apply ½ inch of irrigation within 24-48 hours after any application.
oryzalin (Surflan 4AS, WDG)	1.5-2 lb.	1.5-2 qts.	1-1.5 fl. oz.	Bermudagrass Centipedegrass Zoysiagrass Tall Fescue	<ul style="list-style-type: none"> • Provides PRE control of certain annual grassy weeds and broadleaves. • Label allows use on well-established tall fescue stands in warm-season climates; however, the potential for turfgrass injury with this treatment is significant. • May thin over-seeded turfgrass stands. • Do not use on newly sprigged turfgrass. • Delay re-seeding or over-seeding for 4 months after last application. • Apply a single application of 1.5 oz. per 1,000 sq. ft. or split applications of 1.5 oz. per 1,000 sq. ft. 8 to 10 weeks apart. • Apply ½ inch of irrigation within 24-48 hours after any application.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
ethofumesate (Prograss 1.5EC)	1 lb.	2.67 qt.	2 fl.oz.	Creeping bentgrass Ky. Bluegrass P. Ryegrass Tall Fescue Bermudagrass (Dormant)	<ul style="list-style-type: none"> • For use by professional applicators only; not registered for use by homeowners. • Provides PRE and early POST (up to 30 days after emergence) control of annual bluegrass. • Do not apply to putting golf greens. • Can be used on creeping bentgrass maintained at fairway height or higher. • Do not apply within 8 weeks of a plant growth regulator application; allow at least 3 weeks after a single application of Primo Maxx. • Rate given is for dormant bermudagrass; reduced rates are required for other turfgrasses listed. Refer to product label. • Common bermudagrass is less tolerant than hybrid bermudagrass. • When overseeding, apply 2 weeks after emergence when seedlings are 1 inch tall or after the first cutting. • To avoid delays in spring green-up, apply the third week of November and 3- 4 weeks later.
isoxaben (Gallery 75DF)	0.5-1 lb.	0.66-1.33 lb.	0.25-0.5 oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Only provides PRE broadleaf weed control (does not control grassy weeds). • On newly-seeded, re-seeded or over-seeded turfgrass stands, apply only after new seedlings have reached the three-leaf stage and begin to tiller. • Do not seed, re-seed or over-seed within 2 months of the last application. • Do not apply to golf greens or tees. • Apply ½ inch of irrigation within 24-48 hours after any application.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
metolachlor (Pennant Magnum)	1.24 to 2.48 lb	1.3-2.6 pts	0.5-1.0 fl oz	Bermudagrass Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> • Provides PRE control of certain annual grassy weeds and sedges. • For split applications, apply no less than 1 pt/A every 6 weeks. • Do not apply more than 2.6 pt/A per year; commercial sod producers can apply 4.2 pt/A per year. • May cause temporary slowed growth or yellowing after application. • Efficacy may be reduced on stands with excessive thatch. • Do not re-seed 4 months before or 6 months after application. • Do not apply in the fall if considering over-seeding. • Apply ½ inch of irrigation within 24-48 hours after any application.
oxadiazon (Ronstar G)	2-4 lb.	100-200 lb.	2.3-4.6 lb.	Bermudagrass Creeping bentgrass Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • NOT FOR USE ON HOME LAWNS. • Do not apply more than 150 lbs/A to creeping bentgrass. • Do not apply to creeping bentgrass mowed at 3/8 in. or less. • Do not apply to golf greens or tees, regardless of species. • Creeping red fescue is susceptible. • Do not apply to wet turf. • May be applied during the establishment of bermudagrass and zoysiagrass from sprigs/stolons. • Delay over-seeding for 4 months after last application. • Apply ½ inch of irrigation within 24-48 hours after any application.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
oxadiazon (Ronstar 50WSP and Fonstar FLO)	2-4 lb.	4-8 lb.	1.5 to 3.0 oz.	Bermudagrass (DORMANT) Zoysiagrass (DORMANT)	<ul style="list-style-type: none"> • NOT FOR USE ON HOME LAWNS. • Apply when dormant (thus, do not use in fall for annual bluegrass) at least 2 to 3 weeks prior to green-up. • May be applied when establishing bermudagrass and zoysiagrass vegetatively; however, apply immediately after sprigging. • Do not apply more than 4 lb ai/A in a single application or more than 8 lb ai/A per year. • Delay over-seeding for 4 months after last application. • Apply ½ inch of irrigation within 24-48 hours after any application.
pendimethalin (Pendulum Aquacap, Pendulum 3.3 EC, Pre-M 3.3EC, others)	1.5-3 lb.	See Label	See Label	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Apply to well-established turfgrasses that have been mowed at least four times. • Do not apply to creeping bentgrass mowed at less than ½ inch. • Use on golf greens and tees is not recommended, regardless of species. • Do not re-seed within 3 months of last application. • Do not sprig/stolonize treated areas within 5 months after last application. • Apply ½ inch of irrigation within 24-48 hours after any application.
prodiamine (Barricade 65WG and 4FL, Regalkade 0.5G, others)	0.6-1.5 lb.	See Label	See Label	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Do not re-seed within 7 months of last application. • Do not apply to golf greens. • Do not apply to creeping bentgrass mowed at less than ½ inch. • Do not apply within 60 days after over-seeding. • For summer annual grassy weed control, make second application 8 to 10 weeks after initial application. • Apply ½ inch of irrigation within 24-48 hours after any application.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
prodiamine + sulfentrazone (Echelon 4SC)	0.25-1.125 lb	8-36 fl. oz.	0.184-0.826 fl. oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> Do not apply to golf greens or tees. Do not apply to creeping bentgrass mowed lower than ½ inch. Application to certain varieties of chewings fine fescue or tall fescue may result in undesirable injury. Avoid re-seeding, over-seeding or sprigging treated areas for 3 to 12 months after application (see label). Apply ½ inch of irrigation within 24-48 hours after any application.
pronamide (Kerb 50WP)	1-1.5 lb.	2-3 lb.	0.75-1 oz.	Bermudagrass Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> RESTRICTED-USE PESTICIDE. Provides PRE and post control of annual bluegrass. Apply when air temperature is less than 55 F. Can be used to remove overseeded perennial ryegrass. Make application when warm-season grasses are at 50 percent green-up, as dormant applications may slow spring green-up. Transition will be slower than with other herbicides used for spring transitioning. Complete transitioning may take 4 to 6 weeks.
siduron (Tupersan 50WP)	8-12 lb.	16-24 lb.	5.9-8.8 oz.	Creeping bentgrass Fine Fescue Ky. Bluegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> Rates listed are for use on established turf. Reduced rates are needed when applied at seeding (see label). Can be used in newly sprigged or established Zoysiagrass. Do not apply to warm-season grasses other than Zoysiagrass. For creeping bentgrass, see label for variety susceptibility.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
simazine (Princep 4L and 90DF)	1-2 lb.	See Label	See Label	Bermudagrass Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> • Provides PRE and early post control of annual bluegrass and PRE control of certain broadleaf weeds. • Apply after Oct. 1st. • For weeds that emerge after the initial application, a second application can be made at least 30 days after the initial application (before June 1st the following year). • Apply a single application of the low rate on newly sprigged turfgrass or certain hybrid bermudagrass (see label). • Do not over-seed with desirable turfgrass 4 months before or 6 months after application. • Do not use on golf greens.

Weed Susceptibility to Preemergence Herbicides

A list of commercially available herbicides used for preemergence weed control is presented in the table on pages 17-18. This table is designed to assist in herbicide selection. Ratings are based on optimum timing and the most susceptible stage of weed growth. Often, sequential applications of a given herbicide will improve control. The use of brand or trade names is for clarity and information, and does not imply the endorsement of a product to the exclusion of others that may be of similar, suitable composition. It does not guarantee or warrant the standard of a product. The omission of a particular trade name is not intended to reflect adversely, or to show bias against, any product or trade name not mentioned. Often pre-mixed combination products (two or more active ingredients) containing the same active ingredients can have different trade names.

Always refer to the product label for specific information on proper herbicide use, tank-mix compatibility and turfgrass tolerance. The omission of a particular trade name is not intended to reflect adversely or to show bias against any product or trade name not mentioned. Often pre-mixed combination products (two or more active ingredients) containing the same active ingredients can have different trade names. Tank-mixing more than one chemical may improve efficacy, as will delivering sequential applications of a single chemical. These strategies may result in undesirable turfgrass injury. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science Web site, <http://tennesseeturfgrassweeds.org>

KEY TO CONTROL CODES: E = Excellent (90-100%); G = Good (80-90%); F = Fair (70-80%); P = Poor, commercially unacceptable, control LND = Labeled for control of the given weed species, but no UT efficacy data is available; N = Not labeled or active against the given weed species or no UT efficacy data available

Weed Type	Aatrex (atrazine)	Balan (benefin)	Barricade (prodiamine)	Bensumec (bensulide)	Dimension (dithiopyr)	Echelon (prodiamine + sulfentrazone)	Gallery (isoxaben)	Pendulum (pendimethalin)	Pennant Magnum (metolachor)	Princep (simazine)	Prograss (ethofumesate)	Ronstar (oxadiazon)	Surflan (oryzalin)	Team (benefin + trifluralin)	Tupersan (siduron)	Tower (dimethenamid-P)	XL 2G (benefin + oryzalin)
Grassy Weeds Germinating from Seed																	
Bluegrass, annual	E	G	E	E	E	E	N	E	G	E	G	E	E	E	N	F	G
Crabgrass (<i>Digitaria</i> spp.)	F	G	E	E	E	E	N	E	G	G	LND	E	E	E	G	F	E
Foxtails (<i>Setaria</i> spp.)	LND	LND	LND	LND	LND	LND	N	LND	LND	LND	LND	LND	LND	LND	LND	LND	LND
Goosegrass	F	P	E	LND	E	E	N	G	G	F	N	E	E	G	N	F	G
Jewgrass, annual	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nimblewill	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Orchardgrass	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Smutgrass	N	N	N	N	LND	N	N	N	N	N	N	N	N	N	N	N	N
Other Weed Species																	
Certain small seeded summer annual broadleaf weeds	F	LND	LND	N	LND	G	E	F	LND	LND	N	LND	LND	LND	N	LND	LND

Weed Type	Aatrex (atrazine)	Balan (benefin)	Barricade (prodiamine)	Bensumec (bensulide)	Dimension (dithiopyr)	Echelon (prodiamine + sulfentrazone)	Gallery (isoxaben)	Pendulum (pendimethalin)	Pennant Magnum (metolachor)	Princep (simazine)	Prograss (ethofumesate)	Ronstar (oxadiazon)	Surflan (oryzalin)	Team (benefin + trifluralin)	Tupersan (siduron)	Tower (dimethenamid-P)	XL 2G (benefin + oryzalin)
Certain small seeded winter annual broadleaf weeds	F	LND	LND	N	LND	G	E	F	N	LND	LND	N	LND	N	N	LND	LND
Sedges and Kyllinga	N	N	N	N	N	G	N	N	G	N	LND	N	N	N	N	LND	N

Postemergence Herbicide Options

The following table lists postemergence (POST) herbicides for controlling established perennial and annual weeds in turf. Many POST herbicides require precise application to minimize the potential of injury to desirable turf. Please refer to the weed susceptibility tables when selecting an appropriate herbicide. In general, control of perennial and large annual weeds often requires repeat herbicide applications. For optimum control of perennial and large annual weeds, make applications before target weeds become mature.

Always refer to the product label for specific information on proper herbicide use, tank-mix compatibility and turfgrass tolerance. The omission of a particular trade name is not intended to reflect adversely or to show bias against any product or trade name not mentioned. Often pre-mixed combination products (two or more active ingredients) containing the same active ingredients can have different trade names. Tank-mixing more than one chemical may improve efficacy, as will delivering sequential applications of a single chemical. These strategies may result in undesirable turfgrass injury. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science Web site, <http://tennesseeturfgrassweeds.org>

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
2,4-D amine (2,4-D Amine 4L, Others)	0.75-1 lb.	1.5-2 pt.	0.55-0.73 fl. oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> To newly seeded or re-seeded turfgrass, delay application until after at least the second mowing. Delay re-seeding for 4 weeks after last application. Do not apply to newly over-seeded warm-season grasses. May cause injury to creeping bentgrass. Application rates are usually one-half of those used on other turf species (refer to product label). Avoid applications when air temperatures exceed 85°F. Use half-label rate on centipedegrass.
2,4-D + fluroxypyr+ dicamba (Escalade 2)	1-1.5 lb.	2-3 pt.	0.75-1.1 fl. oz.	Bermudagrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> Do not apply to seedling grasses until well established. Do not apply when air temperatures exceed 90°F. Not for use on creeping bentgrass greens or tees. Apply at ≤ 2 pt/acre on creeping bentgrass fairways. Rates of 1-1.5 pt/acre are recommended under conditions of turf stress. Sequential applications should be at least 4 weeks apart.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
2,4-D + MCPP or MCPA + dicamba (Three-way, Trimec, Tripower, Others)	Various products with various concentrations. Thus refer to actual product label for use rates.			Bermudagrass Centipedegrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • This combination of active ingredients provides the most broad-spectrum weed control compared to either active ingredient applied alone. • Temporary injury may result with applications made to warm-season grasses during transition periods. • Reduced rates are required for centipedegrass. • Delay re-seeding for 3-4 weeks after last application. • Avoid applications when air temperatures exceed 85°F.
2,4-D + triclopyr + fluroxypr (Momentum fx2)	1-1.4 lb.	3-4 pt.	1.1-1.5 fl. oz.	Bermudagrass* Centipedegrass* Creeping bentgrass* Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass*	<ul style="list-style-type: none"> • *Do not apply to these unless potential injury can be tolerated; also, do not apply more than 3 pt/acre to these species. • Do not apply to warm-season turfgrass mowed at less than ½ inch. • Re-seed no sooner than 3 to 4 weeks after application. • Do not use on golf greens or tees. • Apply at ≤ 2 pt/acre on creeping bentgrass fairways. • Rates of 1-1.5 pt/acre are recommended under conditions of turf stress. • Sequential applications should be at least 4 weeks apart.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
atrazine (AAtrex 4L and 90DF)	1-2 lb.	See Label	See Label	Bermudagrass (Dormant) Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> • RESTRICTED-USE PESTICIDE. • Provides PRE and early post control of annual bluegrass and PRE control of certain broadleaf weeds. • Do not apply more than 1 lb ai/A in a single application or more than 2 lb ai/A per year. • Apply only the 1 lb ai/A rate to newly sprigged turfgrass. • Do not apply to newly seeded bermudagrass or zoysiagrass until it has developed a strong rhizome system and has over-wintered. • To control winter annual weeds, apply after Oct. 1st to non-overseeded turfgrass stands. A second application can be made at least 30 days after the initial application (before April 15th). • Do not over-seed treated areas within 4 months before or 6 months after application. • Do not use on golf greens.
bentazon (Basagran T/O, Lescogran)	1 lb.	2 pts	0.75 fl. oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Do not apply to golf greens. • For optimum sedge control, do not mow within 3 to 5 days before or after application. • Do not apply if rain is anticipated within 48 hours. • Make repeat application when sufficient re-growth occurs (approximately 10 to 21 days after initial application). • Use a minimum of 1 gallon of water carrier per 1000 ft².

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
bispyribac-sodium (Velocity 17.6SG)	0.066-0.099 lb.	6-9 oz.	0.138-0.207 oz.	Creeping bentgrass P. Ryegrass	<ul style="list-style-type: none"> • Labeled for use on golf course fairways and tees only. • Do not apply to golf greens. • Do not apply to perennial ryegrass mowed to less than 0.375 in. • Do not apply to non-overseeded bermudagrass. • Do not apply if air temperatures are less than 50F or if the maximum temperatures are expected to be less than 50F for three days after application. • Two applications may be needed for complete control.
bromoxynil (Buctril 4EC)	0.25-0.5 lb.	0.5-1 pt.	0.188-0.375 fl. oz.	Bentgrass Bermudagrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Not labeled for use on home lawns. • Do not apply more than 1 pt/acre per growing season.
carfentrazone (Quicksilver T&O 1.9EC)	0.016-0.031 lb.	1.1-2.1 fl. oz.	0.025-0.048 fl. oz.	Bermudagrass Centipedegrass Creeping Bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Safe on newly seeded or established turf 7 days after emergence. • Allow a minimum of two weeks between repeat applications. • Can be applied with phenoxy herbicides, such as 2,4-D, dicamba or MCPP, to broaden spectrum and weed control. • Carfentrazone is moderately toxic to fish and toxic to aquatic invertebrates. Do not apply to surface water or in a manner in which the herbicide could come in contact with aquatic life. • Sequential applications are used to control silvery thread moss (<i>Bryum argenteum</i>) at 6.7 fl. oz. per acre.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
carfentrazone + MCPA + MCPP + dicamba (Powerzone)	0.81-2.18	2-6 pt.	0.7-2.2 fl. oz.	Bermudagrass Creeping Bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • The addition of carfentrazone to phenoxy herbicide mixtures is primarily to increase the speed at which weed phytotoxicity occurs after application. • Carfentrazone improves the cool-weather performance of phenoxy herbicide mixtures. • May temporarily discolor some hybrid bermudagrass species. • Do not apply to creeping bentgrass golf greens. • Do not apply when air temperatures exceed 90°F, as some turfgrass injury can be expected. • Treated areas can be re-seeded 2 weeks after application. • Do not apply to turfgrass seedlings until they have been mowed at least twice. • Allow 3 to 4 weeks before applying to newly sprigged/ stolonized areas.
carfentrazone + 2,4-D + MCPP + dicamba (Speedzone Southern)	0.55-1.39 lb.	2-5 pt.	0.7-1.8 fl. oz.	Bermudagrass Creeping Bentgrass Cenitpedegrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • A more concentrated formulation of these active ingredients is sold under the trade name SpeedZone is recommended for use on cool-season turf. • The addition of carfentrazone to phenoxy herbicide mixtures is primarily to increase the speed at which weed phytotoxicity occurs after application. • Carfentrazone improves the cool-weather performance of phenoxy herbicide mixtures. • May temporarily discolor some hybrid bermudagrass species. • Do not apply to creeping bentgrass golf greens. • Do not apply when air temperatures exceed 90°F, as some turfgrass injury can be expected. • Treated areas can be re-seeded 2 weeks after application. • Do not apply to turfgrass seedlings until they have been mowed at least twice. • Allow 3 to 4 weeks before applying to newly sprigged/ stolonized areas.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
chlorsulfuron (Corsair 75WDG, Telar 75WDG)	0.75-4 oz.	1-5.33 oz.	0.023-0.122 oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass Zoysiagrass	<ul style="list-style-type: none"> Do not apply to bentgrass mowed less than 0.5 inch. Do not apply to tall fescue or perennial ryegrass. Tracking of applied herbicide onto non-target species by maintenance equipment or human traffic should be considered. It is recommended that light, frequent irrigation be used to wash the herbicide from the leaf surface and into the soil profile the two mornings after application. Repeat applications 4 to 6 weeks later may be necessary for complete control of certain species. Discoloration or delayed green-up can occur when applications are made during times of environmental stress or during spring transition.
clopyralid + triclopyr (Confront)	0.375-0.75 lb.	1-2 pt.	0.37-0.74 fl. oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> Do not re-seed within three weeks after application. Do not use on golf course greens or tees. To creeping bentgrass, apply only the lowest labeled rate (may cause injury, see label). Use rate is dependent on target weed(s) (refer to product label). Do not apply to warm-season grasses when mowing height is less than ½ inch. Not for use on residential turf. Do not re-seed treated areas for 3 weeks after application. Do not collect grass clippings when mowing treated areas.
dicamba (Banvel 4S, Vanquish 4S, Others)	0.25-0.5 lb.	0.5-1 pt.	0.2-0.4 fl. oz.	Bermudagrass Creeping bentgrass Fine Fescue Ky. Bluegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> To newly seeded or re-seeded turfgrass, delay application until after at least the second mowing. Delay re-seeding for 4 weeks after last application. Do not apply to newly over-seeded warm-season grasses. May cause injury to bentgrass; reduce rates by one-half (refer to product label). Do not apply over roots of shallow-rooted trees or shrubs.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
diclofop-methyl (Illoxan 3EC)	0.75-1 lb.	33-43 fl. oz.	0.75-1.0 fl. oz.	Bermudagrass	<ul style="list-style-type: none"> • RESTRICTED-USE PESTICIDE. • For use on golf courses only. • Provides postemergence goosegrass control in bermudagrass greens, tees, fairways and closely mowed roughs. • Apply only to well-established bermudagrass. • Do not re-seed for at least 2 months after application. Thorough spray coverage is essential. • Product is most effective on goosegrass under close mowing. • Use high rate when goosegrass has 4 leaves or more.
dithiopyr (Dimension 1EC, 40WP, 2EW, Others)	0.38-0.5 lb.	See Label	See Label	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Provides PRE and early POST control of crabgrass (up to 1 tiller stage). • Post activity is improved with addition of a non-ionic surfactant (0.5 %v/v). • Apply to well-established turfgrasses that have received at least 2 mowings. • See label for variety susceptibility. • All formulations restrict use on creeping bentgrass golf greens; the EC formulation does mention use on creeping bentgrass greens. • Do not apply more than 1.5 lbs ai/A per year • Do not re-seed within 4 months of last application. • Bermudagrass can be over-seeded with perennial ryegrass 8 weeks after the last application. • For summer annual grass control, make a second application 5 to 10 weeks after the initial application. • Apply ½ inch of irrigation within 24-48 hours of any application.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
diquat (Reward 2L)	0.25-0.5 lb.	1-2 pt.	0.37-0.74	Bermudagrass* (DORMANT) Zoysiagrass* (DORMANT)	<ul style="list-style-type: none"> • *Must be dormant; apply prior to initiation of green-up. • Will also remove over-seeded perennial ryegrass. • Add 1-2 pt. of non-ionic surfactant per 100 gallons of water carrier. • May require repeat applications.
ethofumesate (Prograss 1.5EC)	1 lb.	2.67 qt.	2 fl.oz.	Bentgrass Ky. Bluegrass P. Ryegrass Tall Fescue Bermudagrass (DORMANT)	<ul style="list-style-type: none"> • Provides PRE and early post control of annual bluegrass. • For use by professional applicators. • Can be applied to home lawns by certified applicators; not registered for use by homeowners. • Do not apply to golf greens. • Can be used on bentgrass maintained at fairway height (see label). • Do not apply within 8 weeks following a plant growth regulator application; on creeping bentgrass, applications can be made 3 weeks after Primo Maxx has been applied. • Rate given is for dormant bermudagrass. • Reduced rates are required for other turfgrasses listed (see label). • Common bermudagrass is less tolerant than hybrid bermudagrass. • When overseeding, apply 2 weeks after emergence when seedlings are 1 inch tall or after the first cutting. Make a second application at 21-28 days after the initial application.
fenoxaprop (Acclaim Extra 0.57EC)	0.06-0.17 lb.	13-39 fl. oz.	0.3-0.9 fl. oz.	Creeping Bentgrass Fine Fescue Ky. Bluegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Safe to apply to well-established turfgrasses listed. • Do not apply to bermudagrass. • Can be used on creeping bentgrass (see specific directions in product label). • Can be applied to newly plugged zoysiagrass. • Repeat application every 28 to 35 weeks (dependent on re-growth). • Do not use more than 28 fl. oz/A on Kentucky bluegrass or zoysiagrass.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
flazasulfuron (Katana 25WG)	0.0078- 0.047 lb.	0.5-3 oz	0.011-0.068 oz.	Bermudagrass Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> • Do not apply to new seeded, sodded or sprigged turfgrass until well established. • Do not use on golf course putting greens. • Care should be taken when herbicide could move with surface water onto non-target susceptible species, such as creeping bentgrass or perennial ryegrass. • Tracking of applied herbicide onto non-target species by maintenance equipment or human traffic should be considered. • It is recommended that light, frequent irrigation be used to wash the herbicide from the leaf surface and into the soil profile the two mornings after application. • Efficacy against annual bluegrass can be increased by applying at least 1 lb of N fertilizer per 1000 sq ft prior to application.
fluazifop (Fusilade II)	0.03-0.09 lb.	2-6 fl. oz.	0.05-0.14 fl. oz.	Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Provides bermudagrass and dallisgrass suppression in tall fescue and zoysiagrass turf. • Apply at 5-6 oz/A on tall fescue. • Apply at 3-4 oz/A on zoysiagrass. • Avoid applications when desirable turf is under stress. • Labeled for use in residential areas but not home lawns. • The inclusion of Turflon Ester at 32 oz/A improves bermudagrass suppression and reduces injury to desirable turf species. • Repeat application every 28 to 35 weeks (dependent on re-growth). • Fusilade II is not labeled for use on home lawns. • A less concentrated formulation of fluazifop is sold for use on home lawns under the trade name ORNAMEC.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
foramsulfuron (Revolver 0.19SC)	0.006- 0.052 lb	4.4-35.2 fl. oz.	0.1-0.8 fl. oz.	Bermudagrass Zoysiagrass	<ul style="list-style-type: none"> • Apply when daily average temperature exceeds 70°F. • Do not exceed 1.25 fl oz of product/1000 sq ft per season. • Allow product to dry for at least 2 hours on foliage. • On bermudagrass, this product may be applied up to 1 week prior to overseeding with perennial ryegrass. • On newly established (seeded and sprigged/ stolonized) bermudagrass stands, delay applications for 2 weeks; for zoysiagrass stands, allow 3 weeks. • Labeled for use on overseeded bermudagrass greens only. • Care should be taken when herbicide could move with surface water onto non-target susceptible species, such as bentgrass or perennial ryegrass. • Tracking of applied herbicide onto non-target species by maintenance equipment or human traffic should be considered. • It is recommended that light frequent irrigation be used to wash the herbicide from the leaf surface and into the soil profile the two mornings after application. • Repeat applications 4 to 6 weeks later may be necessary for complete control of difficult-to-control species.
glyphosate (Roundup ProMax, Others)	0.5 lb.	See Label	See Label	Bermudagrass* (DORMANT)	<ul style="list-style-type: none"> • *Must be dormant; apply prior to initiation of green-up. • Will control various grassy and broadleaf species in addition of over-seeded perennial ryegrass. • Does not control white clover.
glufosinate (Finale)	0.75-1.5 lb.	3-6 qt.	2.2-4.4 fl. oz.	Bermudagrass* (DORMANT)	<ul style="list-style-type: none"> • *Must be dormant; apply prior to initiation of green-up. • Do not apply more than 6 qt/A per year. • Sequential applications may be required for certain weed species.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
halosulfuron (SedgeHammer 75DF)	0.031-0.062 lb.	0.67-1.33 oz.	0.45-0.9 grams	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Do not apply to golf greens. • May require a repeat application 6 to 10 weeks after the initial application. • Do not make more than four applications per year. • Do not apply more than 5.33 oz of product per acre per year. • Including a nonionic surfactant at 0.25-0.50% v/v will improve control. • For optimum control, do not mow within two days before or after application.
imazaquin (Image 70DG)	0.37-0.5 lb.	8.6-11.4 oz.	0.2-0.26 oz.	Bermudagrass Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> • May induce temporary yellowing of tolerant species for 7 to 14 days if applied under stressful conditions. • Do not apply to golf greens. • Do not apply to warm-season grasses over-seeded with perennial ryegrass. • If tall fescue is present and desired, do not apply. • Do not re-seed or over-seed or sprig turfgrasses for at least 45 days after last application. • Do not apply within 6 weeks of initiation of green-up. • Do not apply during spring green-up or fall transition to dormancy. • Apply 0.25-0.5 inches of irrigation or rainfall within 1-7 days after application. • Do not apply within 30 days of harvesting sod.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
mesotrione (Tenacity 4L)	0.125-0.25 lb.	4-8 fl. oz.	0.092-0.18 fl. oz.	Bermudagrass (DORMANT) Centipedegrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue	<ul style="list-style-type: none"> • Exhibits short-lived PRE in addition to POST activity against various grassy and broadleaf weed species. • Will not control white clover. • Mixtures with PSII and PPO-inhibiting herbicides widen the spectrum of weed control. • Beginning in 2010, labeled use sites include golf courses, sod production, athletic fields and parks. • Applications result in foliar bleaching (whitening) of sensitive species. • Do not apply more than 5 fl oz/A to perennial ryegrass or fine fescue. • Do not apply more than 16 fl oz/A in one season. • Efficacy can be affected by temperature, humidity and light. • Sequential applications are required to provide complete control of most species. • To reduce movement onto sensitive species, such as bentgrass, withhold traffic until spray has dried and irrigate lightly to move product from turf foliage before resuming normal irrigation. • Do not apply an organophosphate or carbamate insecticide within 7 days of application, as turf injury may occur. • Do not use on golf course greens and maintain a 5-foot buffer between treated areas and golf greens. • Do not apply more than 0.5 lb. ai/acre per season. • Safe for use at and soon after seeding most labeled grasses (see label).

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
metribuzin (Sencor 75DF)	0.25-0.5 lb.	0.33-0.67 lb.	0.12-0.25 oz.	Bermudagrass	<ul style="list-style-type: none"> • Dormant bermudagrass make a single application at the high rate. • Non-dormant bermudagrass: apply low to high rate. • Do not apply to golf greens, tees or turf mowed closer than ½ inch. • Proper application to non dormant bermudagrass will result in temporary discoloration. • If necessary, make a second application no sooner than 1 week after initial application.
metsulfuron (Manor 60DF, Blade 60DF)	0.08-0.6 oz.	0.125-1 oz.	0.08-0.65 grams	Bermudagrass Centipedegrass Fine Fescue Ky. Bluegrass Zoysiagrass	<ul style="list-style-type: none"> • Do not apply to turf less than 1 year old. • Do not apply to turf under stress from drought, heat, cold or pests. • Adding a nonionic surfactant at 0.25% v/v will improve efficacy but increase the chance of turf injury. • On cool-season turf, apply 0.25-0.5 oz/A; however, do not exceed 0.5 oz/A in a 9 month period. • On centipedegrass, apply 0.25-0.5 oz/A. • Tracking of applied herbicide onto non-target species by maintenance equipment or human traffic should be considered. • It is recommended that light frequent irrigation be used to wash the herbicide from the leaf surface and into the soil profile the two mornings after application. • Two applications will be needed to remove overseeded perennial ryegrass.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
prodiamine + sulfentrazone (Echelon 4SC)	0.25-1.125 lb.	8-36 fl. oz.	0.184-0.826 fl. oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Exhibits early POST and predominately PRE activity against grassy weeds, sedges and small seeded broadleaves. • Do not apply to golf greens or tees. • Do not apply to creeping bentgrass mowed lower than 0.5 inches. • Application rates for bermudagrass exceed those of other tolerant species (see label). • Application to certain varieties of chewing fine fescue or tall fescue may result in undesirable injury. • Delay applications to newly established turfs until after the second mowing has occurred. • Do not apply more than 36 fl oz of product per acre each season. • Re-seeding, over-seeding or sprigging of treated areas within 3 to 12 months after application could inhibit the establishment of desirable grasses (see label for exact times). • Do not harvest sod within 90 days after application.
pronamide (Kerb 50WP)	0.5-1.5 lb.	1-3 lb.	0.37-1 oz.	Bermudagrass Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> • RESTRICTED-USE PESTICIDE. • Provides PRE and POST control of annual bluegrass. • Apply when air temperature is less than 55°F. • Root uptake is the predominate route of entry into weeds; irrigate immediately after application. • Spring applications can be made to remove fall overseeded perennial ryegrass. Make application when warm-season grasses are at 50 percent green-up, as a dormant application may slow green-up. • May take 4 to 6 weeks to transition.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
quinclorac (Drive XLR8)	0.75 lb.	2 qt.	1.45 fl. oz.	Bermudagrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Drive will not interfere with seeding, re-seeding or over-seeding of tall fescue, zoysiagrass or bermudagrass. Delay applications for 28 days after the emergence of perennial ryegrass, Kentucky bluegrass and fine fescue. • When applied prior to seeding (7 days or greater), no time restrictions are required. • Do not use a surfactant with applications to seedling turf. • Do not apply to fine fescue unless part of a blend. • May cause temporary discoloration of fine fescues, hybrid bermudagrass and creeping bentgrass; discoloration can be mitigated with chelated iron or soluble N fertilizer. • May be applied before or after sprigging bermudagrass and zoysiagrass. • Do not use on golf course greens or collars. • Do not mow for 2 days before or after application. • Requires the addition of a methylated seed oil when applied to mature turf. • Allow application to dry for 24 hours. • Reduced rates are required for applications to creeping bentgrass. • Do not apply more than 1.5 lbs ae/acre per year. • Avoid drift to non-target vegetation (especially tomatoes).

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
quinclorac + MCPP + dicamba (Onetime)	1.225 lb.	64 fl. oz.	1.45 fl. oz.	Bermudagrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Do not apply to fine fescue unless part of a blend. • May cause temporary discoloration of fine fescues, hybrid bermudagrass and creeping bentgrass; discoloration can be mitigated with chelated iron or soluble N fertilizer. • Requires the addition of a methylated seed oil. • Do not use on golf course greens and collars. • Do not mow for 2 days before or after application. • Clippings from the first three mowings should be left on the treated area. • Do not apply more than 2 applications per year. • Do not make repeat applications in less than 30-day intervals. • Do not apply to turfgrass grown for sod. • Avoid drift to non-target vegetation (especially tomatoes).
quinclorac + sulfentrazone (Solitare 75WG)	0.75-1.5 lb.	16-32 fl. oz.	0.367-0.735 fl. oz.	Bermudagrass Centipedegrass Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • See label for use rates for cool- and warm-season species. • Use of a surfactant is not recommended. • Do not apply to golf course greens, collars or tees. • Do not apply to turf under stressed conditions. • Delay re-seeding, over-seeding or sprigging for 1 month after application. • Over-seeding of bermudagrass with perennial ryegrass can be done at 2 to 4 weeks after an application, if slight injury to perennial ryegrass can be tolerated. • Do not apply to sod within 3 months of harvest.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
quinclorac + sulfentrazone + 2,4-D + dicamba (Q-4)	1.35-1.54 lb.	7-8 pt.	2.6-3 fl. oz.	Bermudagrass (DORMANT) Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass (DORMANT)	<ul style="list-style-type: none"> Do not use on golf course greens, tees and/or collars. Delay application of this product to new seedlings until after the second or third mowing, or at least 28 days after emergence. If applied prior to seeding, wait at least 28 days before applying new seed. Delay application of this product 3 to 4 weeks after sodding, sprigging or plugging any turfgrass species. Do not apply to turf under stress. Do not apply when temperatures exceed 90°F. Do not apply more than 2 applications per season. Do not irrigate within 24 hours after application. Do not mow for 2 days before or after application.
rimsulfuron (Tranxit GTA)	0.125-0.5 oz.	0.5-2.0 oz.	0.32-1.3 grams	Bermudagrass Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> Not for use on home lawns. Should not be applied in areas where children can contact turf. Tracking of applied herbicide onto non-target species by maintenance equipment or human traffic should be considered. It is recommended that light, frequent irrigation be used to wash the herbicide from the leaf surface and into the soil profile the two mornings after application. Efficacy may be reduced under abnormal growing conditions (saturated soil, drought/heat stress, etc.). In cold weather, the 2.0 oz rate is recommended. Do not apply to newly sprigged/sodded bermudagrass. Can be used on non-overseeded bermudagrass greens; yellowing may occur if not fully dormant. Can be used to remove overseeded perennial ryegrass and roughstalk bluegrass from bermudagrass greens, fairways and tees. Allow 14 days or more before seeding/overseeding into treated areas.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
sethoxydim (Segment)	0.28 lb.	1.5-2.25 pt.	0.8 fl. oz.	Centipedegrass	<ul style="list-style-type: none"> • Can be used on only on centipedegrass (see label for directions). • In new plantings, do not apply until centipedegrass has 3 in. of new stolon growth. • In established centipedegrass, do not apply until at least 3 weeks after spring green-up. • Do not mow for 7 days before or after application. • Do not apply to turfgrasses other than centipedegrass (other turfgrasses spot treatment only). • On newly established, do not apply more than 1.5 pt/A per application and 3 pt/A per season. • On mature centipedegrass, do not apply more than 2.25 pt/A per application and 4.5 pt/A per season. • Does not control dallisgrass, annual bluegrass or sedges.
simazine (Princep 4L and 90DF)	1-2 lb.	See Label	See Label	Bermudagrass Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> • Provides PRE and early post control of annual bluegrass and PRE control of certain broadleaf weeds. • Apply after Oct. 1st. • For weeds that emerge after the initial application, a second application can be made at least 30 days after the initial application (before June 1st the following year). • Apply a single application of the low rate on newly sprigged turfgrass or certain hybrid bermudagrass (see label). • Do not over-seed with desirable turfgrass 4 months before or 6 months after application. • Do not use on golf greens.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
sulfentrazone (Dismiss 4L)	0.125-0.375 lb.	4-12 fl. oz.	0.092-0.275 fl. oz.	Bermudagrass Centipedegrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • See label for use rates for cool- and warm-season species. • Do not apply to golf course greens and tees. • Delay re-seeding, over-seeding or sprigging for 1 month after application. • Over-seeding of bermudagrass with perennial ryegrass can be done at 2 to 4 weeks after application, if slight perennial ryegrass injury can be tolerated. • Do not apply to sod within 3 months of harvest. • Use of surfactants is not recommended.
sulfentrazone + imazethapyr (Dismiss South)	0.29-0.45 lb.	9.5-14.4 fl. oz.	0.22-0.331 fl. oz.	Bermudagrass Centipedegrass Zoysiagrass	<ul style="list-style-type: none"> • Do not apply to golf course greens or tees. • Delay re-seeding, over-seeding or sprigging for 1 month after application. • Overseeding of bermudagrass with perennial ryegrass can be done at 2 to 4 weeks after an application, if slight perennial ryegrass injury can be tolerated. • Do not apply to sod within 3 months of harvest. • Use of surfactants is not recommended. • Mixtures with trinexapac-ethyl (Primo Maxx) are not recommended.
sulfentrazone + 2,4-D + MCPP + dicamba (Surge)	0.75-1.09 lb.	2.75-4 pt.	1-1.5 fl. oz.	Bermudagrass Creeping bentgrass Fine Fescue Ky. Bluegrass P. Ryegrass Tall Fescue Zoysiagrass	<ul style="list-style-type: none"> • Do not apply to creeping bentgrass greens or tees. • Do not broadcast apply at temperatures above 90°F. • Do not apply to turf under stress. • Do not apply to warm-season turf transitioning into or out of winter dormancy. • The addition of sulfentrazone often allows this herbicide to provide improved efficacy in cooler weather compared to other three-way mixtures. • Treated areas may be reseeded 3 weeks after application. • Do not make more than 2 applications per season. • Allow foliage to dry for at least 6 hours after application. • Avoid mowing for 2 days before and after treatment.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
sulfosulfuron (Certainty 75WDG)	5.3 – 43 g	0.25-2 oz.	0.16 – 1.3 g	Bermudagrass Centipedegrass Creeping bentgrass Kentucky bluegrass Zoysiagrass	<ul style="list-style-type: none"> • Certain ornamental and native grasses exhibit tolerance to this product (see label). • Do not exceed 2.66 oz. of this product per acre per year. • Heavy rainfall or irrigation within 2 hours may wash this product off the foliage and a repeat application may be required for adequate control. • Repeat applications may be necessary for complete control of difficult-to-control weeds. • Do not apply to tall fescue. • Applications to creeping bentgrass require lower use rates (see label). • Only apply to perennial ryegrass and fine fescue if they are part of a mixture with Kentucky bluegrass.
Triclopyr (Turflon Ester)	0.5-1 lb.	0.5-1 qt.	0.367-0.735 fl. oz.	Ky. Bluegrass P. Ryegrass Tall Fescue	<ul style="list-style-type: none"> • Do not apply to golf course greens. • Mow newly seeded turfgrass 2 or 3 times before treating. • Do not reseed for 3 weeks after application. • Can provide bermudagrass suppression at 1 qt/A; this efficacy is improved when the product is applied in mixtures with Fusilade II at 6 fl oz/A. • Do not apply more than 8 lb ae/A per season.

Herbicide active ingredient (Product Name Ex.)	Herbicide Rate			Labeled Turfgrass	Remarks and Precautions
	a.i. per Acre	Product per Acre	Product per 1000 sq. ft.		
trifloxysulfuron (Monument 75WG)	0.016 - 0.025 lb	0.35-0.53 oz.	0.23-0.35 grams	Bermudagrass Zoysiagrass	<ul style="list-style-type: none"> • Tracking of applied herbicide onto non-target species by maintenance equipment or human traffic should be considered. • It is recommended that light, frequent irrigation be used to wash the herbicide from the leaf surface and into the soil profile the two mornings after application. • Care should be taken when herbicide could move with surface water onto non-target susceptible species, such as creeping bentgrass or perennial ryegrass. • Repeat applications may be necessary for complete control of difficult-to-control weeds. • Do not apply more than 1.7 oz of product/A each year • On newly established stands, delay applications for 4 weeks after sprigging, sodding or seedling emergence. • On bermudagrass, this product may be applied up to 3 weeks prior to overseeding with perennial ryegrass. • Do not apply to turfgrass under stress.

Weed Susceptibility to Postemergence Herbicides

A list of commercially available herbicides used for postemergence weed control is presented in the table below. Many POST herbicides require precise application to minimize the potential of injury to desirable turf. Please refer to the weed susceptibility tables when selecting an appropriate herbicide. In general, control of perennial and large annual weeds often requires repeat herbicide applications. For optimum control of perennial and large annual weeds, make applications before target weeds become mature.

Always refer to the product label for specific information on proper herbicide use, tank-mix compatibility and turfgrass tolerance. The omission of a particular trade name is not intended to reflect adversely, or to show bias against, any product or trade name not mentioned. Often pre-mixed combination products (two or more active ingredients) containing the same active ingredients can have different trade names. Tank-mixing more than one chemical may improve efficacy, as will delivering sequential applications of a single chemical. These strategies may result in undesirable turfgrass injury. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science Web site, <http://tennesseeturfgrassweeds.org>

KEY TO CONTROL CODES: E = Excellent (90-100%); G = Good (80-90%); F = Fair (70-80%); P = Poor, commercially unacceptable, control LND = Labeled for control of the given weed species, but no UT efficacy data is available; N = Not labeled or active against the given weed species or no UT efficacy data available

Weed Type	2,4-D amine	Aatrex (Atrazine)	Acclaim Extra (fenoxaprop)	Banvel (dicamba)	Basagran T/O (bentazon)	Buctril (bromoxynil)	Certainty (sulfosulfuron)	Confront (triclopyr + clopyralid)	Corsair (chlorosulfuron)	Dimension (dithiopyr)	Dismiss (sulfentrazone)	Dismiss South (sulfentrazone + imazethapyr)	Drive XLR8 (quinclorac)	Echelon (proflaminate + sulfentrazone)	Escalade II (fluroxypyr + 2,4-D + dicamba)	Finale (glufosinate)	Fusilade II (fluzifop)	Illoxan (diclofop-methyl)	Image (imazaquin)	Katana (flazasulfuron)	Kerb (pronamide)	Manor (metsulfuron)
Grassy weeds (emerged)																						
Barley, little	N	LND	N	N	N	N	LND	N	N	N	N	N	N	N	N	LND	N	N	N	N	N	N
Bermudagrass, common	N	N	F	N	N	N	N	N	N	N	N	N	N	N	N	F	F	N	N	N	N	N
Bluegrass, annual	N	E	N	N	N	N	F	N	F	N	N	N	N	N	N	E	P	N	LND	F	LND	F
Crabgrass (<i>Digitaria</i> spp.)	N	P	G	N	N	N	P	N	N	F	N	N	E	F	N	E	G	N	LND	F	N	N
Dallisgrass	N	N	P	N	N	N	P	N	N	N	N	N	N	N	N	F	F	N	N	P	N	N

Weed Type	2,4-D amine	Aatrex (Atrazine)	Acclaim Extra (fenoxaprop)	Banvel (dicamba)	Basagran T/O (bentazon)	Buctril (bromoxynil)	Certainty (sulfosulfuron)	Confront (triclopyr + clopyralid)	Corsair (chlorosulfuron)	Dimension (dithiopyr)	Dismiss (sulfentrazone)	Dismiss South (sulfentrazone + imazethapyr)	Drive XLR8 (quinclorac)	Echelon (prodiamine + sulfentrazone)	Escalade II (fluroxypyr + 2,4-D + dicamba)	Finale (glufosinate)	Fusilade II (fluazifop)	Illoxan (diclofop-methyl)	Image (imazaquin)	Katana (flazasulfuron)	Kerb (pronamide)	Manor (metsulfuron)
Fescue, tall	N	F	N	N	N	N	P	N	E	N	N	N	N	N	N	F	N	N	LND	E	LND	N
Foxtails (<i>Setaria</i> spp)	N	LND	LND	N	N	N	N	N	N	N	N	N	LND	N	N	LND	LND	N	N	N	N	LND
Goosegrass	N	G	G	N	N	N	N	N	N	N	P	LND	N	P	N	G	F	G	N	P	N	N
Jewgrass, annual	N	N	LND	N	N	N	N	N	N	N	N	N	N	N	N	LND	G	N	N	N	N	N
Nimblewill	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	F	N	N	N	N	N	N
Orchardgrass	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	G	N	N	N	LND	N
Ryegrass, perennial	N	N	N	N	N	N	F	N	LND	N	N	N	N	N	N	LND	N	N	LND	E	F	F
Smutgrass	N	N	N	N	N	N	N	N	LND	N	N	N	N	N	N	N	N	N	N	N	N	N
Broadleaf weeds (emerged)																						
Bedstraw (<i>Galium</i> spp.)	F	G	N	G	N	N	LND	G	LND	N	LND	LND	N	N	E	N	N	N	N	LND	N	N
Bittercress (<i>Cardamine</i> spp)	G	N	N	G	N	N	N	G	N	N	LND	LND	N	LND	LND	N	N	N	LND	LND	N	LND
Buttercup (<i>Ranunculus</i> spp)	E	N	N	F	N	N	LND	G	G	N	LND	LND	N	LND	E	G	N	N	LND	F	N	G
Carolina geranium	F	G	N	G	N	N	LND	G	N	N	LND	LND	LND	LND	G	P	N	N	LND	LND	N	G
Carpetweed	G	G	N	G	N	F	N	G	N	N	G	LND	N	LND	G	G	N	N	LND	N	N	N
Chickweed, common	G	G	N	G	LND	N	LND	F	G	N	G	LND	N	LND	G	G	N	N	LND	LND	LND	G
Chickweed, mouse-ear	F	G	N	G	LND	N	N	F	G	N	G	LND	N	LND	G	G	N	N	LND	LND	LND	G
Clover, hop	P	F	N	G	N	N	N	E	G	N	LND	LND	LND	LND	LND	LND	N	N	N	LND	N	N
Clover, white	P	F	N	G	N	N	P	E	E	N	P	LND	E	LND	E	F	N	N	LND	G	N	G
Dandelion	G	N	N	G	LND	P	LND	G	LND	N	P	LND	LND	LND	G	P	N	N	LND	LND	N	G

Weed Type	2,4-D amine	Aatrex (Atrazine)	Acclaim Extra (fenoxaprop)	Banvel (dicamba)	Basagran T/O (bentazon)	Buctril (bromoxynil)	Certainty (sulfosulfuron)	Confront (triclopyr + clopyralid)	Corsair (chlorosulfuron)	Dimension (dithiopyr)	Dismiss (sulfentrazone)	Dismiss South (sulfentrazone + imazethapyr)	Drive XLR8 (quinclorac)	Echelon (prodiamine + sulfentrazone)	Escalade II (fluroxypyr + 2,4-D + dicamba)	Finale (glufosinate)	Fusilade II (fluzafop)	Illoxan (diclofop-methyl)	Image (imazaquin)	Katana (flazasulfuron)	Kerb (pronamide)	Manor (metsulfuron)
Deadnettle, purple	F	G	N	G	N	N	N	E	G	N	G	N	N	N	E	E	N	N	LND	F	N	G
Docks (<i>Rumex</i> spp.)	LND	LND	N		N	N	N	G	G	N	LND	LND	N	LND	LND	LND	N	N	N	N	N	LND
Ground Ivy	P	N	N	F	N	P	LND	G	N	N	LND	LND	G	LND	G	P	N	N	N	N	N	G
Henbit	F	G	N	G	N	N	LND	E	G	N	G	LND	N	LND	E	E	N	N	LND	G	N	G
Knotweed, prostrate	P	F	N	F	N	F	N	G	LND	N	LND	LND	N	LND	G	N	N	N	N	N	N	G
Lespedeza, common	P	E	N	F	N	N	N	E	N	N	LND	LND	N	LND	E	N	N	N	N	N	N	LND
Mugwort	P	N	N	G	N	N	N	G	N	N	N	N	N	N	G	LND	N	N	N	N	N	N
Mustards	G	G	N	G	LND	LND	LND	G	LND	N	N	N	N	N	G	LND	N	N	N	N	N	LND
Pennycress	LND	G	N	G	N	LND	LND	G	N	N	N	N	N	N	LND	LND	N	N	N	N	N	LND
Pepperweed	LND	G	N	G	N	LND	N	G	N	N	N	N	N	N	LND	N	N	N	N	N	N	N
Plantain (<i>Plantago</i> spp.)	G	F	N	F	LND	N	N	G	LND	N	P	LND	N	LND	G	LND	N	N	N	N	N	F
Purslane	F	LND	N	F	LND	N	N	G	LND	N	LND	LND	N	LND	G	LND	N	N	N	N	N	G
Red sorrel	N	F	N	G	N	N	N	E	N	N	N	LND	N	LND	LND	N	N	N	LND	N	N	N
Sheperdspurse	LND	E	N	G	LND	LND	LND	LND	LND	N	LND	LND	N	N	LND	LND	N	N	N	N	N	LND
Speedwell (<i>Veronica</i> spp.)	P	F	N	F	N	N	N	F	N	N	F	LND	LND	LND	G	G	N	N	N	N	N	N
Spurge, prostrate	P	G	N	F	LND	N	N	G	N	N	LND	LND	N	LND	G	LND	N	N	N	N	N	LND
Virginia,buttonweed	P	N	N	P	N	N	P	G	G	N	P	N	P	N	G	F	N	N	LND	F	N	F
Wild carrot	LND	E	N	F	N	N	N	N	LND	N	N	N	N	N	LND	N	N	N	N	N	N	LND
Wild garlic	F	N	N	F	LND	N	LND	F	F	N	LND	LND	N	LND	F	P	N	N	G	N	N	G
Wild strawberry	LND	N	N	G	N	N	N	E	N	N	N	N	N	N	LND	N	N	N	N	N	N	N

Weed Type	2,4-D amine	Aatrex (Atrazine)	Acclaim Extra (fenoxaprop)	Banvel (dicamba)	Basagran T/O (bentazon)	Buctril (bromoxynil)	Certainty (sulfosulfuron)	Confront (triclopyr + clopyralid)	Corsair (chlorosulfuron)	Dimension (dithiopyr)	Dismiss (sulfentrazone)	Dismiss South (sulfentrazone + imazethapyr)	Drive XLR8 (quinclorac)	Echelon (proflaminate + sulfentrazone)	Escalade II (fluroxypyr + 2,4-D + dicamba)	Finale (glufosinate)	Fusilade II (fluzifop)	Illoxan (diclofop-methyl)	Image (imazaquin)	Katana (flazasulfuron)	Kerb (pronamide)	Manor (metsulfuron)
Wild violet	N	F	N	G	N	N	N	G	LND	N	LND	LND	LND	LND	N	N	N	N	LND	N	N	N
Yarrow	N	E	N	G	N	N	N	G	N	N	N	N	N	N	LND	N	N	N	N	N	N	LND
Yellow woodsorrel	N	E	N	G	LND	F	N	F	N	N	LND	LND	N	LND	LND	LND	N	N	N	LND	N	G
Sedge and Kyllinga Species (emerged)																						
Yellow nutsedge	N	N	N	N	F	N	G	N	N	N	E	E	N	G	N	P	N	N	F	G	N	N
Purple nutsedge	N	N	N	N	LND	N	G	N	N	N	F	G	N	N	N	P	N	N	F	F	N	N
<i>Kyllinga</i> spp.	N	N	N	N	N	N	LND	N	N	N	G	G	N	N	N	P	N	N	F	G	N	N

Weed Type	Momentum Fx2 (2,4-D +fluroxypyr + triclopyr)	Monument (trifloxysulfuron)	Onetime (quinclorac + MCPP + dicamba)	Princep (simazine)	Power Zone (carfentrazone + MCPA +MCP + dicamba)	Prograss (ethofumesate)	Q4 (quinclorac + sulfentrazone + 2,4-D + dicamba)	Quicksilver (carfentrazone)	Revolver (foramsulfuron)	Reward (diquat)	Roundup (glyphosate)	SedgeHammer (halosulfuron)	Segment (sethoxydim)	Sencor (metribuzin)	Solitare (quinclorac + sulfentrazone)	Speed Zone Southern (carfentrazone + 2,4-D + MCPP+ dicamba)	Surge (sulfentrazone + 2,4-D + MCPP + dicamba)	Tenacity (mesotrione)	TranXit (rimsulfuron)	Trimec Classic (2,4-D + MCPP + dicamba)	Turflon Ester (triclopyr)	Velocity (bispyribac-sodium)
Grassy weeds (emerged)																						
Bermudagrass, common	N	N	N	N	N	P	N	N	N	P	F	N	G	P	N	N	N	P	N	N	P	N
Barley, little	N	LND	N	N	N	N	N	N	LND	LND	G	N	N	N	N	N	N	N	LND	N	N	N
Bluegrass, annual	N	G	N	G	N	E	N	N	G	G	E	N	N	G	N	N	N	P	G	N	N	E
Crabgrass (<i>Digitaria</i> spp.)	N	F	G	LND	N	N	G	N	P	P	E	N	G	N	E	N	N	G	N	N	P	N
Dallisgrass	N	P	N	N	N	N	N	N	P	P	E	N	F	P	LND	N	N	N	N	N	N	N
Fescue, tall	N	G	N	N	N	N	N	N	P	P	F	N	F	N	N	N	N	N	LND	N	N	N
Foxtails (<i>Setaria</i> spp)	N	N	LND	LND	N	N	LND	N	N	N	LND	N	LND	N	LND	N	N	LND	N	N	N	N
Goosegrass	N	N	N	P	N	N	N	N	F	F	G	N	LND	F	LND	N	N	F	N	N	N	N
Jewgrass, annual	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Nimblewill	N	N	N	N	N	N	N	N	N	N	G	N	N	N	N	N	N	E	N	N	N	N
Orchardgrass	N	N	N	N	N	N	N	N	N	N	LND	N	LND	N	N	N	N	N	N	N	N	N
Ryegrass, perennial	N	E	N	N	N	N	N	N	G	N	F	N	N	N	N	N	N	N	G	N	N	N
Smutgrass	N	N	N	N	N	N	N	N	N	N	LND	N	N	N	N	N	N	N	N	N	N	N
Broadleaf weeds (emerged)																						
Bedstraw (<i>Galium</i> spp.)	E	N	LND	N	G	N	LND	G	N	P	N	N	N	LND	N	G	LND	N	N	LND	N	N
Bittercress (<i>Cardamine</i> spp)	LND	N	N	N	LND	N	N	N	N	P	LND	N	N	N	LND	G	N	N	N	LND	N	N

Weed Type	Momentum Fx2 (2,4-D +fluroxypyr + triclopyr)	Monument (trifloxysulfuron)	Onetime (quinclorac + MCPP + dicamba)	Princep (simazine)	Power Zone (carfentrazone + MCPA +MCP + dicamba)	Prograss (ethofumesate)	Q4 (quinclorac + sulfentrazone + 2,4-D + dicamba)	Quicksilver (carfentrazone)	Revolver (foramsulfuron)	Reward (diquat)	Roundup (glyphosate)	Sedgehammer (halosulfuron)	Segment (sethoxydim)	Sencor (metribuzin)	Solitare (quinclorac + sulfentrazone)	Speed Zone Southern (carfentrazone + 2,4-D + MCPP+ dicamba)	Surge (sulfentrazone + 2,4-D + MCPP + dicamba)	Tenacity (mesotrione)	TranXit (rimsulfuron)	Trimec Classic (2,4-D + MCPP + dicamba)	Turfion Ester (triclopyr)	Velocity (bispyribac-sodium)
Buttercup (<i>Ranunculus</i> spp)	E	G	LND	N	G	N	LND	P	N	P	G	N	N	LND	LND	G	G	F	N	G	G	N
Carolina geranium	G	LND	LND	G	G	N	LND	P	N	P	P	N	N	G	LND	G	F	N	N	G	G	N
Carpetweed	G	E	LND	F	G	N	LND	G	N	G	G	N	N	N	G	G	G	G	N	G	G	N
Chickweed, common	G	G	LND	G	F	LND	LND	P	N	E	G	N	N	F	G	F	G	F	G	P	G	LND
Chickweed, mouse-ear	G	G	LND	G	F	N	LND	P	LND	G	G	N	N	F	G	F	G	F	G	P	F	LND
Clover, hop	LND	LND	LND	N	N	N	LND	N	LND	N	N	N	N	LND	LND	LND	LND	LND	N	LND	LND	LND
Clover, white	E	G	E	F	G	LND	E	P	LND	P	P	N	N	P	E	G	G	N	N	G	G	LND
Dandelion	G	G	LND	N	G	N	G	P	N	P	G	N	N	N	LND	G	G	LND	N	G	G	LND
Deadnettle, purple	E	G	LND	F	G	N	G	F	N	G	G	N	N	N	N	G	G	N	N	E	G	N
Docks (<i>Rumex</i> spp.)	LND	N	LND	N	LND	N	LND	N	N	N	LND	N	N	N	LND	LND	LND	LND	N	LND	LND	N
Ground Ivy	G	LND	G	P	G	N	G	P	N	P	G	N	N	N	G	G	G	G	N	G	F	N
Henbit	E	F	LND	F	G	N	LND	F	LND	G	G	N	N	LND	LND	G	G	LND	LND	E	F	LND
Knotweed, prostrate	G	N	LND	N	G	N	LND	F	N	F	G	N	N	LND	LND	G	LND	G	N	G	G	N
Lespedeza, common	E	N	LND	N	G	N	LND	P	N	P	LND	N	N	N	LND	G	LND	N	N	G	LND	N
Mugwort	G	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Mustards	G	N	LND	G	G	N	G	LND	N	G	G	N	N	LND	N	G	G	N	N	G	LND	N
Pennycress	LND	N	LND	N	N	N	N	LND	N	N	LND	N	N	N	N	LND	N	N	N	LND	N	N
Pepperweed	LND	N	LND	LND	LND	N	LND	N	N	N	LND	N	N	N	N	LND	LND	N	N	LND	N	N

Weed Type	Momentum FX2 (2,4-D + fluoxypyr + triclopyr)	Monument (trifloxysulfuron)	Onetime (quinclorac + MCPP + dicamba)	Princep (simazine)	Power Zone (carfentrazone + MCPA + MCPP + dicamba)	Prograss (ethofumesate)	Q4 (quinclorac + sulfentrazone + 2,4-D + dicamba)	Quicksilver (carfentrazone)	Revolver (foramsulfuron)	Reward (diquat)	Roundup (glyphosate)	SedgeHammer (halosulfuron)	Segment (sethoxydim)	Sencor (metribuzin)	Soltare (quinclorac + sulfentrazone)	Speed Zone Southern (carfentrazone + 2,4-D + MCPP + dicamba)	Surge (sulfentrazone + 2,4-D + MCPP + dicamba)	Tenacity (mesotrione)	TranXit (rimsulfuron)	Trimec Classic (2,4-D + MCPP + dicamba)	Turflon Ester (triclopyr)	Velocity (bispyribac-sodium)
Plantain (<i>Plantago</i> spp.)	G	N	LND	F	G	N	G	P	N	P	G	N	N	N	LND	G	G	P	N	G	G	LND
Purslane	G	N	N	LND	G	N	LND	F	N	G	LND	N	N	N	LND	G	LND	LND	N	G	N	N
Red sorrel	LND	N	LND	N	LND	N	LND	N	N	N	N	N	N	N	LND	LND	LND	N	N	LND	N	N
Shepherdspurse	LND	LND	LND	LND	LND	N	LND	LND	N	N	LND	N	N	LND	N	LND	LND	LND	N	LND	N	N
Speedwell (<i>Veronica</i> spp.)	G	N	LND	G	G	N	G	P	N	F	G	N	N	LND	F	G	G	F	N	G	F	N
Spurge, prostrate	G	N	LND	N	G	N	LND	N	N	G	G	N	N	N	LND	G	LND	N	LND	G	G	N
Virginia buttonweed	G	G	F	N	F	N	G	P	N	P	G	N	N	N	N	F	G	P	LND	F	F	N
Wild carrot	LND	N	N	N	LND	N	LND	N	N	N	N	N	N	N	N	LND	LND	LND	LND	LND	LND	N
Wild garlic	F	G	N	N	F	N	G	P	N	P	P	N	N	N	LND	F	G	P	N	F	N	N
Wild strawberry	LND	N	LND	N	LND	N	LND	N	N	N	N	N	N	N	N	LND	LND	N	N	LND	N	N
Wild violet	N	N	LND	N	LND	N	LND	LND	N	N	N	N	N	N	LND	LND	N	LND	N	N	LND	N
Yarrow	LND	N	LND	N	LND	N	LND	N	N	N	N	N	N	N	N	LND	LND	N	N	LND	LND	N
Yellow woodsorrel	LND	LND	LND	N	LND	N	LND	N	N	N	N	N	N	N	LND	LND	LND	LND	N	LND	LND	LND
Sedge and Kyllinga Species (emerged)																						
Yellow nutsedge	N	E	N	N	N	N	F	N	N	P	F	E	N	N	E	N	F	F	N	N	N	LND
Purple nutsedge	N	N	N	N	N	N	N	N	N	N	LND	G	N	N	F	N	N	N	N	N	N	N
<i>Kyllinga</i> spp.	N	LND	N	N	N	N	N	N	N	N	N	G	N	N	G	N	N	N	N	N	N	N

Established Turfgrass Tolerance to Herbicides

This table is designed to assist in selecting a herbicide for use on established turf. Always refer to the product label for specific information on proper herbicide use, tank-mix compatibility and turfgrass tolerance. The omission of a particular trade name is not intended to reflect adversely or to show bias against any product or trade name not mentioned. Often pre-mixed combination products (two or more active ingredients) containing the same active ingredients can have different trade names. Tank-mixing more than one chemical may improve efficacy as will making sequential applications of a single chemical. These strategies may result in undesirable turfgrass injury. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science Web site, <http://tennesseeturfgrassweeds.org>

KEY TO TOLERANCE CODES: L = Labeled for use on the selected turf species/location; D= Labeled for use on the selected turf species/location when dormant; S= Special label directions N = Not labeled

Herbicide	Cool-season Turfgrass						Warm-season Turfgrass				
	Creeping Bentgrass	Creeping Bentgrass (golf greens)	Kentucky Bluegrass	Tall Fescue	Fine Fescue	Perennial Ryegrass	Bermudagrass	Hybrid Bermudagrass	Bermudagrass (Golf Greens)	Centipedegrass	Zoysiagrass
2,4-D amine	S	S	L	L	L	L	L	L	L	S	L
Aatrex (atrazine)	N	N	N	N	N	N	D	D	N	L	L
Acclaim Extra (fenoxaprop)	S	N	L	L	L	L	N	N	N	N	L
Balan (benefin)	N	N	L	L	L	L	L	L	N	L	L
Banvel (dicamba)	S	S	L	L	L	L	L	L	S	L	L
Barricade (prodiamine)	S	N	L	L	L	L	L	L	N	L	L
Basagran L/O (bentazon)	L	N	L	L	L	L	L	L	N	L	L
Bensumec (bensulide)	L	L	L	L	L	L	L	L	L	L	L
Buctril (bromoxynil)	L	N	L	L	L	L	L	L	N	N	L
Certainty (sulfosulfuron)	L	N	L	N	N	N	L	L	N	L	L
Confront (triclopyr + clopyralid)	S	N	L	L	L	L	L	L	N	L	L

Herbicide	Cool-season Turfgrass						Warm-season Turfgrass				
	Creeping Bentgrass	Creeping Bentgrass (golf greens)	Kentucky Bluegrass	Tall Fescue	Fine Fescue	Perennial Ryegrass	Bermudagrass	Hybrid Bermudagrass	Bermudagrass (Golf Greens)	Centipedegrass	Zoysiagrass
Corsair (chlorosulfuron)	S	N	L	N	L	N	L	L	N	S	S
Dimension (dithiopyr)	S	N	L	L	S	L	L	L	N	L	L
Dismiss (sulfentrazone)	L	N	L	L	L	L	L	L	N	L	L
Dismiss South (sulfentrazone + imazethapyr)	N	N	N	N	N	N	L	L	N	L	L
Drive XLR8 (quinclorac)	S	N	L	L	S	L	L	L	N	N	L
Echelon (proflam + sulfentrazone)	S	N	L	L	S	L	L	L	N	L	L
Escalade II (fluroxypyr + 2,4-D + dicamba)	S	N	L	L	L	L	L	L	N	N	L
Finale (glufosinate)	N	N	N	N	N	N	D	D	N	N	N
Fusilade II (fluazifop)	N	N	N	L	N	N	N	N	N	N	L
Gallery (isoxaben)	L	N	L	L	L	L	L	L	N	L	L
Illoxan (diclofop-methyl)	N	N	N	N	N	N	L	L	L	N	N
Image (imazaquin)	N	N	N	N	N	N	L	L	N	L	L
Katana (flazasulfuron)	N	N	N	N	N	N	L	L	N	L	L
Kerb (pronamide)	N	N	N	N	N	N	L	L	L	L	L
Manor (metsulfuron)	N	N	L	N	L	N	L	L	L	N	N
Momentum Fx2 (2,4-D + fluroxypyr + triclopyr)	S	N	L	L	L	L	S	S	N	S	S
Monument (trifloxysulfuron)	N	N	N	N	N	N	L	L	N	L	L
Onetime (quinclorac + MCP + dicamba)	S	N	L	L	S	L	L	L	N	N	L
Pendulum (pendimethalin)	S	N	L	L	L	L	L	L	L	L	L

Herbicide	Cool-season Turfgrass						Warm-season Turfgrass				
	Creeping Bentgrass	Creeping Bentgrass (golf greens)	Kentucky Bluegrass	Tall Fescue	Fine Fescue	Perennial Ryegrass	Bermudagrass	Hybrid Bermudagrass	Bermudagrass (Golf Greens)	Centipedegrass	Zoysiagrass
Pennant Magnum (metolachlor)	N	N	N	N	N	N	L	L	N	L	L
Princep (simazine)	N	N	N	N	N	N	L	L	N	L	L
Power Zone (carfentrazone + MCPA + MCPP + dicamba)	N	N	L	L	L	L	L	L	N	N	L
Prograss (ethofumesate)	L	N	L	L	N	L	D	D	N	N	N
Q4 (quinclorac + sulfentrazone + 2,4-D + dicamba)	N	N	L	L	L	L	D	D	N	N	D
Quicksilver (carfentrazone)	L	L	L	L	L	L	L	L	L	L	L
Revolver (foramsulfuron)	N	N	N	N	N	N	L	L	S	N	L
Reward (diquat)	N	N	N	N	N	N	D	D	D	N	N
Ronstar G (oxadiazon)	S	N	L	L	N	L	S	S	N	N	L
Ronstar WSP or F (oxadiazon)	N	N	N	N	N	N	D	D	D	N	D
Roundup Pro (glyphosate)	N	N	N	N	N	N	D	D	D	N	N
SedgeHammer (halosulfuron)	L	N	L	L	L	L	L	L	N	L	L
Segment (sethoxydim)	N	N	N	N	L	N	N	N	N	L	N
Sencor (metribuzin)	N	N	N	N	N	N	S	S	N	N	N
Solitare (quinclorac + sulfentrazone)	N	N	L	L	N	L	L	L	N	L	L
Speed Zone (carfentrazone + 2,4-D + MCPP + dicamba)	L	N	L	L	L	L	L	L	N	N	L
Surflan (oryzalin)	N	N	N	N	N	N	L	L	N	L	L

Herbicide	Cool-season Turfgrass						Warm-season Turfgrass				
	Creeping Bentgrass	Creeping Bentgrass (golf greens)	Kentucky Bluegrass	Tall Fescue	Fine Fescue	Perennial Ryegrass	Bermudagrass	Hybrid Bermudagrass	Bermudagrass (Golf Greens)	Centipede	Zoysiagrass
Surge (sulfentrazone + 2,4-D + MCPP + dicamba)	L	N	L	L	L	L	L	L	L	N	L
Team (benefin + trifluralin)	N	N	L	L	S	L	L	L	N	L	L
Tenacity (mesotrione)	N	N	L	L	S	S	D	D	N	L	N
Tower (dimethanamid-P)	S	N	L	L	L	L	L	L	N	L	L
TranXit (rimsulfuron)	N	N	N	N	N	N	L	L	S	N	L
Trimec Classic (2,4-D + MCPP + dicamba)	S	S	L	L	L	L	L	L	S	S	L
Tupersan (siduron)	S	S	L	L	L	L	N	N	N	N	L
Turflon Ester (triclopyr)	N	N	L	L	N	L	N	N	N	N	N
Velocity (bispyribac-sodium)	L	N	N	N	N	L	S	S	N	N	N
XL 2G (benefin + oryzalin)	N	N	N	L	N	N	L	L	N	L	L

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