

TURFGRASS WEED RESPONSE TO PREEMERGENCE HERBICIDES

HERBICIDES	ANNUAL GRASSES				ANNUAL BROADLEAVES										PERENNIAL GRASSES				PERENNIAL BROADLEAVES																
	Annual bluegrass	Crabgrass	Goosegrass	Sandbur	Bittercrs	Common Chickweed	Corn Speedwell	Henbit	Hop Clover	Knotweed	Lespedeza	Parsley Plant	Spurges	Spurweed	Bahiagrass	Bermudagrass	Dallisgrass	Tall Fescue	Clovers	Dandelion	Dichondra	Docks	Ground Ivy	Mallow	Mock Strawberry	Mousear Chickweed	Pennywort	Plantains	Woodsorrel	Violets	Virginia Buttonweed	OTHER WEEDS	Nutsedge, Yellow	Wild Garlic/onion	
atrazine (AAtrex)	E	F			E	E	E	E	E	E	E	E	E		F		F		E	F	G	G					E	G	E		F				
benefin (Balan)	E	E	F	F		G	E	G				E														E									
benefin + oryzalin (XL)	E	E	F	G		G		G		L		E	G																						
benefin + trifluralin (Team)	E	E	F	F								E																							
bensulide (Betasan)	F	E	F	G						G	G	E																							
bensulide + oxadiazon (Goose/Crab)	F	E	E	G																															
dithiopyr (Dimension)	E	E	G		E	E	G	E				E	G																						
ethofumesate (Prograss)	G					L									F																				
indaziflam (Specticle)	E	E	E																																
isoxaben (Gallery)	P	P	P	P	E	E	E	E	E			E	E	E																					
metolachlor (Pennant)	F	F	F	F																															F
oryzalin (Surflan)	G	E	G	G		G		G		L		G	E																						
oxadiazon (Ronstar)	G	E	E	F		P	G	P	G	G	G	E	F	P																					
pendimethalin (Pendulum Aquacap)	G	E	G	G		L		L					G																						
prodiamine (Barricade)	E	E	G			G		G		G			G																						
siduron (Tupersan)		G	P							P			P			F																			
simazine (Princep)	E	F			E	E	G	E	E	G	E	G	G	E			F		G							E									

E = Excellent, ≥ 90% control. Good = 80% to 89% control. F = Fair, 70% to 79% control. P = Poor, <70% control.
 L = Weed species is listed on the herbicide label, but has not been evaluated by the University of Arkansas. _ = Weed response is not kno

TURFGRASS WEED RESPONSE TO POSTEMERGENCE HERBICIDES

HERBICIDES	ANNUAL GRASSES					ANNUAL BROADLEAVES								PERENNIAL GRASSES				PERENNIAL BROADLEAVES											OTHER WEEDS									
	Annual bluegrass	Crabgrass	Goosegrass	Sandbur		Bittercress	Common Chickweed	Corn Speedwell	Henbit	Hop Clover	Knotweed	Lespedeza	Parsley Piert	Spurges	Spurweed	Bahiagrass	Bermudagrass	Dallisgrass	Tall Fescue		Clovers	Dandelion	Dichondra	Docks	Ground Ivy	Mock Strawberry	Mouseear Chickweed	Pennywort	Plantains	Woodsorrel	Violets	Virginia Buttonweed	Nutsedge, purple	Nutsedge, yellow	Wild Garlic/onion	Green Kyllinga		
2,4-D (many)						G	F	F	F	F	F	F	F	F							F	F		G	F	F	F	F	P	P	F	P				G		
2,4-D + dichlorprop (DPC)						E	E	E	E	E	G	E	E	G	G						E	E		E	G	G	E	E	F	F	G	G				G		
2,4-D + dichlorprop + dicamba						E	E	E	E	E	G	E	E	G	G						E	E		E	G	G	E	E	F	F	G	G				G		
carfentrazone (Quicksilver)														G	G																							
chlorsulfuron (Corsair)						G		G						G	G																							
clopyralid (Lontrel)									E			P									E																	
dicamba (Banvel)						E	E	E	E	E	E	G	E	G	G						E	E	G	E	G	G	E	E	F	F	G	F						
dicamba + iodosulfuron + thiencazone (Celsius)						G	G	G				G		G	G						G	G	G		G		G		G	G								
diclofop (Illoxan)				E																																		
diquat (Reward)	E	E	E	E		E	E	G	E		G	E	E	E				G																				
ethofumesate (Prograss)	E																																					
fenoxaprop (Acclaim)		G	L														F																					
foramsulfuron (Revolver)	E	P	E															G																				
glyphosate	E	E	E	E		E	E	E	E	E	E	E	E	E		G	E	E	E		F	E	E	E	G	G	E	E	E	E		F		G		E		
halosulfuron (Sedgehammer)																																				E	G	F
imazaquin (Image)				L		L		L				L														L									G	F	E	E
mecoprop (Mecomec)						L															L			L		L		L	L									
metribuzin	E	G	E	G		G	G	E	G	G	G	E	E	E	E			G			G					E												
metsulfuron (Manor)								E	E	G	E		E	E		E					E	E	G	E	G		E	G	E	E	E	G				E		
pronamide (Kerb)	E					E	E	P				P																										
sethoxydim (Segment)		E	G																																			
simazine (Princep)						E	E	E	E	G		E															E											
triclopyr + clopyralid (Confront)						E	E	E	E	E	G	E	E	G	G						E	E		E	G	G	E	E	F	F	G	G				G		
trifloxysulfuron (Monument)	E	P	P						G							F		G			G		G						P	P			G	E	E	E		
sulfentrazone (Dismiss)																																			F	G	G	
sulfosulfuron (Certainty)	G																																		E	E	E	

E = Excellent, ≥90% control. Good = 80% to 89% control. F = Fair, 70% to 79% control. P = Poor, <70% control.
 L = Weed species is listed on the herbicide label, but has not been evaluated by the University of Arkansas. _ = Weed response is not known.

Turfgrass Tolerance of Postemergence Herbicides

Herbicide	Bermudagrass	Centipedegrass	St. Augustinegrass	Tall Fescue	Zoysiagrass
2,4-D	S	I	I	I	S
2,4-D + dicamba	S	I	I	S	S
2,4-D + dichlorprop (2,4-DP)	S	I	I	S	S
2,4-D + mecoprop	S	I	I	S	S
2,4-D + mecoprop + dicamba	S	I	I	S	S
2,4-D + mecoprop + dichlorprop	S	I	I	S	S
atrazine (AAtrex)	S-I	S-I	S-I	NR	S-I
bentazon (Basagran)	S	S	S	S	S
bromoxynil (Buctril)	S	S	S	S	S
carfentrazone (Quicksilver)	S	S	S	S	S
chlorsulfuron (Corsair)	S	NR	NR	NR	NR
clopyralid (Lontrel)	S	S	S	S	S
dicamba (Banvel)	S	I	I	S	S
dicamba + iodosulfuron + thienencarbazono (Celsius)	S	S	S	NR	S
diclofop (Illoxan)	S	NR	NR	NR	NR
fenoxaprop (Acclaim)	NR	NR	NR	S	S
fluzafop-p (Fusilade II)	NR	NR	NR	S-I	S-I
foramsulfuron (Revolver)	S	NR	NR	NR	S
halosulfuron (Sedge Hammer)	S	S	S	S	S
imazaquin (Image)	I	NR	S	NR	S
MCPA + MCPP + dichlorprop	S	I	I	S	S
mecoprop (MCP)	S	I	I	S	S
mesotrione (Tenacity)	NR	R	I	R	NR
metribuzin	S-I	NR	NR	NR	NR
metsulfuron (Manor)	S	S	S	NR	S
MSMA, DSMA	S	NR	NR	I	I
pronamide (Kerb)	S	NR	NR	NR	NR
sethoxydim (Segment)	NR	S	NR	NR	NR
sulfentrazone (Dismiss)	S	S	NR	S	S
sulfosulfuron (Certainty)	S	S	S	NR	S
topramezone (Pylex)	I	NR	NR	S	S
triclopyr (Turflon)	N	S	NR	S	NR
triclopyr + clopyralid (Confront)	I	NR	NR	S	I
trifloxysulfuron (Monument)	S	NR	NR	NR	S

S = safe at labeled rates, I = Intermediate safety, use at reduced rates, NR = Not registered for use on this turfgrass, do not use.

Turfgrass Tolerance of Preemergence Herbicides

Herbicide	Bermudagrass	Centipedegrass	St. Augustinegrass	Tall Fescue	Zoysiagrass
atrazine (AAtrex)	S	S	S	NR	I-S
benefin (Balan)	S	S	S	S	S
benefin + oryzalin (XL)	S	S	S	S	S
benefin + trifluralin (Team)	S	S	S	S	S
bensulide (PreSan)	S	S	S	S	S
bensulide + oxadiazon (Goosegrass/Crabgrass)	S	NR	NR	NR	S
dithiopyr (Dimension)	S	S	S	S	S
fenarimol (Rubigan)	S	NR	NR	NR	NR
indaziflam (Specticle)	S	S	S	NR	S
isoxaben (Gallery)	S	S	S	S	S
metolachlor (Pennant)	S	S	S	S	S
napropamide (Devrinol)	S	S	S	S	NR
oryzalin (Surflan)	S	S	S	S	S
oxadiazon (Ronstar)	S	NR	S	S	S
pendimethalin (Pre-M)	S	S	S	S	S
prodiamine (Barricade)	S	S	S	S	S
pronamide (Kerb)	S	R	R	NR	R
simazine (Princep)	I	S	S	NR	S

S = safe at labeled rates on healthy mature turf. I = Intermediate safety, may cause minor damage to mature, healthy turf. Consider using the lower end of the rate range. Do not apply to turf under stress. NR = Not registered for use on this species.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
TURFGRASSES	Using Preemergence Herbicides – While degree of persistence varies, most preemergence herbicides provide about 100 days of control and thus require repeat applications for season-long control in the mid-south. Applications must be made before weeds emerge or poor control will result. Recommended dates of application for crabgrass and other annual grasses are February 15 - March 5 for southern Arkansas and March 1-20 in northern Arkansas. Fall preemergence applications for winter annual control: Apply simazine after September 1 for winter weed control unless annual bluegrass is the target, then apply after October 1. Apply atrazine after October 1. If you are not using atrazine or simazine for fall preemergence control of annual bluegrass, apply preemergence treatments on or near September 1 in all parts of the state. Where possible, water-in preemergence herbicides immediately after application. Dinitroaniline herbicides such as benefin, oryzalin, prodi- amine and pendimethalin are not recommended for high traffic areas such as cart path margins, par-3 tees and bare or poorly established areas. For these high traffic areas, especially those with goosegrass, consider using a preemergence product containing oxadiazon. Herbicide-only formulations have been the standard for many years, but the practice of impregnating herbicides on dry fertilizer granules is becoming increasingly popular. Common sense suggests that choosing a fertilizer carrier with relatively uniform particle size will improve the uniformity of herbicide distribution.			

Preemergence - Established Grasses

atrazine @ 1 to 2 lb/A	Annual bluegrass, spurweed, chickweed and many other weeds.	AAtrex 4 L 1 to 2 qt/A.	October to November for spurweed. October 1 to April 1 for most winter annuals.	Restricted use herbicide. Do not apply to cool season grasses. Atrazine provides both preemergence and post emergence control of annual broadleaf weeds. See label for special instructions. Do not apply to fairways or other areas that drain onto golf greens. Avoid applications during greenup. Should only be applied to dormant bermudagrass or zoysiagrass. DO NOT overseed 4 months before or 6 months after treatment. DO NOT apply within the active root zone of ornamental shrubs.
benefin @ 1.5 to 3.0 lb/A	Summer annual grasses, annual bluegrass, some small-seeded broadleaves.	Balan 2.5 G Up to 120 lb/A.	Apply March 15 to April 1 for control of crabgrass or goosegrass. Apply in late summer for control of annual bluegrass.	Do not use on golf course putting greens. Will temporarily thin turf in sites heavily infested with annual bluegrass.
bensulide @ 7.5 to 12.5 lb/A	Summer annual grasses, annual bluegrass, and selected broadleaf weeds.	Bensumec 4 LF 1.88 to 3.13 gal/A or Pre-san 12.5 G 80 to 100 lb/A.	Apply March 15 to April 1 for control of crabgrass or goosegrass. Apply late in the summer for control of annual bluegrass.	Liquid formulation is labeled for use in home lawns and golf courses, granular formulation for golf courses only. 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-P @ 1.0 to 1.5 lb/A	Small-seeded broadleaf weeds, doveweed, purslane, spurge, yellow nutsedge and some annual grasses.	Tower 6 L 21 to 32 oz/A.	Preemerge to target weeds.	Safe on most cool- and warm-season grasses. Sequential applications are permissible at 5 to 8 week intervals, up to a total of 64 fl oz/A (3 lb ai/A) per year. See label for specific instructions.
dithiopyr @ 0.25 to 0.5 lb/A	Annual grasses and small-seeded broadleaf weeds.	Dimension Ultra 40 WP 0.625 to 1.25 lb/A. or Dimension 1 EC or 1 EW 1 to 2 pt/A.	Mid-March to early April.	May be used on most species of turfgrass. Has postemergence activity on very small crabgrass. Do not reseed, overseed, or sprig within 8 weeks of application.
ethofumesate @ 0.75 to 2 lb/A	annual bluegrass, annual grasses and some annual broadleaves. Suppression of bermudagrass in St. Augustine- grass.	Prograss 1.5 L 1 to 2 qt/A. or PoaConstrictor or Prograss 4 SC 0.75 to 2 qt/A.	Preemergence for weeds. Postemergence for suppression of bermudagrass in St. Augustinegrass.	Labeled for use in creeping bentgrass, perennial ryegrass, kentucky bluegrass, tall fescue, and St. Augustinegrass. May also be applied to dormant bermudagrass. Check label for specific rates for each turf type.
flumioxazin @ 0.25 to 0.38 lb/A	Annual bluegrass, winter annual broadleaf weeds, and summer annual grasses.	SureGuard 51 WDG 8 to 12 oz/A. or SureGuard 4 SC 8 to 12 fl oz/A.	Apply March 15 to April 1 for control of crabgrass or goosegrass. Apply late in the fall, after desirable turf is dormant.	Do not use on cool-season turf. Apply only to dormant bermudagrass. Leave at least 15 feet when applying upslope of creeping bentgrass putting greens.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
indaziflam @ 0.014 to 0.04 lb/A	Annual grasses including crabgrass and goosegrass and some broadleaf weeds.	Specticle Flo 3 to 10 fl oz/A or Specticle G 100 to 200 lb/A	Preemergence.	Do not use on cool-season grasses. Use only on well-established grasses. Leave a 15-foot buffer between treated areas and cool-season grasses. Do not apply more than 6 fl oz/A on centipedegrass or St. Augustinegrass.
isoxaben @ 0.5 to 1 lb/A	Broadleaf weeds including spurge.	Gallery 75 DF 0.66 to 1.33 lb/A. or Gallery 4.16 SC 16 to 31 fl oz/A.	Mid-March to early April for summer weeds, October for winter annuals.	Tank mix with a grass herbicide such as Surflan, etc., if using for fall preemergence treatment to improve annual bluegrass control. May be used on most common turfgrasses. Do not use on putting greens.
oxadiazon @ 2 to 4 lb/A	Summer annual grasses including goosegrass, annual bluegrass, and some small-seeded broadleaves.	Ronstar 2 G 100 to 200 lb/A. or Ronstar 50 WP 4 to 8 lb/A. or Ronstar Flo 3.17 L 2.5 to 3.8 qt/A.	Mid-March to early April for summer weeds, October for winter annuals.	Ronstar products are only available for professional applicators. DO NOT apply more than 3 lb ai/acre 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 red fescue, centipede or golf course greens or tees.
oxadiazon + bensulide @ 1.5 + 6 lb/A	Annual grasses including crabgrass and goosegrass and some broadleaf weeds.	Goosegrass/Crabgrass Control 115 lb/A.	Preemergence.	For golf course use only. Apply a light irrigation after treatment. DO NOT use on newly sprigged grasses until well established. Delay reseeding for 5 months after treatment. May be used on bermudagrass and bentgrass greens under conditions of heavy goosegrass infestations. See label for precautions concerning use on putting greens.
oryzalin @ 1.5 to 3 lb/A	Annual grasses and certain broadleaf weeds.	Surflan 4 AS 1.5 to 2.0 qt/A or Surflan XL 2 G 100 to 150 lb/A.	Apply in late fall or early spring prior to the onset of conditions favorable for annual weed germination.	Do not use on cool-season grasses, except tall fescue. Do not apply to newly sprigged grasses until well-established. Delay reseeding 90 to 120 days after application. A second application of surflan can be applied 8 to 10 weeks after initial application for extended control.
pendimethalin @ 1.5 to 3 lb/A	Summer annual grasses, annual bluegrass, and small-seeded broadleaves.	Pendulum AquaCap 3.8 AS 3.15 to 6.31 pt/A.	Spring. Preemergence to target 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 4 months of application. Use the low rate for tall fescue and Kentucky bluegrass. The high rate may be used on warm-season grasses.
prodiamine @ 0.325 to 1.5 lb/A	Annual grasses and some broadleaf weeds.	Barricade 65 WDG 0.5 to 2.3 lb/A. or Barricade 4 L 0.625 to 3 pt/A.	Before crabgrass germinates. Applying around March 15 is usually effective.	Apply only to well established turf. See label for limitations. Do not apply to tees or greens. Do not exceed 0.65 lb of active ingredient per year for centipedegrass and St. Augustinegrass. Do not make more than two applications per calendar year, and allow at least 60 days between treatments. Use a split application for goosegrass control. Wait 4 to 6 months per 0.75 lb of Barricade applied before reseeding.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
TURFGRASSES Preemergence - Established Grasses [cont.]				
simazine @ 1 to 2 lb/A	Annual bluegrass, spurweed and many other winter annual weeds.	Princep Liquid 4 L 1 to 2 qt/A. or Simazine 90 DF 1.1 to 2.2 lb/A.	Apply simazine in October or November for preemergence control of winter annual weeds. Apply December through February for late post emergence control of winter annual weeds.	Do not use on cool season turf. Apply only to dormant turf. Apply low rate for annual blue- grass 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 lb ai/acre on newly sprigged turfgrasses or on hybrid bermudagrass.
S-metolachlor @ 1.8 to 3.9 lb/A	Annual grasses and some small-seeded broadleaf weeds, yellow nutsedge suppression.	Pennant Magnum 7.62 EC 1.3 to 2.6 pt/A.	Mid-March to early April.	May be used on bermuda, zoysia, St. Augustine or centipede. See label for overseeding restrictions. May cause delayed greenup when applied to dormant bermuda. Needs 0.5-inch rainfall or irrigation within 5 days of application.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
TURFGRASSES [cont.]				
Using Postemergence Herbicides – Postemergence herbicides are active only on emerged weeds. In general, these herbicides are most effective on young weeds. Applying postemergence herbicides when temperatures are above 85-90°F may result in increased turfgrass yellowing. In many cases, repeat applications may be needed for satisfactory control. Repeat applications should be timed 4 to 6 weeks apart or until regrowth appears. Repeat applications at moderate rates will usually be preferable for turfgrass safety and weed control compared to single treatments at excessive rates. A rain-free period of 6 to 24 hours is needed for effective control.				
TURFGRASSES Postemergence - Established Grasses				
2,4-D amine @ 1 to 1.5 lb/A	Annual and perennial broadleaf weeds.	Weedar 64, others 2 to 3 pt/A.	Apply in spring or fall when weeds are actively growing.	Apply to small and actively growing broadleaf weeds as a summer or winter treatment. To control wild garlic/onion, use 3 pt/ acre plus a commercial surfactant. Make first application in late November or early December and follow with a second application in February or March. Repeat this schedule for three consecutive years to control this weed. DO NOT apply 2,4-D to St. Augustinegrass or to centipede. DO NOT allow spray to drift to contact the foliage of ornamentals.
2,4-D choline @ 0.24 to 1.9 lb/A	Annual and perennial broadleaf weeds.	Embed Extra 2 to 3 pt/A.	Apply in spring or fall when weeds are actively growing.	For use on sod farms only. Do not use on newly seeded grasses until grass has at least 5-leaves. Maximum of 4 pt/A per application; season maximum is 8 pt/A. DO NOT use on St. Augustinegrass.
2,4-D + mecoprop + dicamba	Annual and perennial broadleaf weeds. Controls a broader spectrum of weeds than 2,4-D alone.	Trimec Classic, Super Trimec, Trimec Southern, Others (See label for rates.)	Apply in spring or fall when weeds are actively growing.	Several commercial formulations are available. See label for the recommended amount of the formulated product. Do not spray when the turfgrass is emerging from winter dormancy. Do not spray St. Augustine or centipede. Delay reseeding for 4 weeks after application.
2,4-D + triclopyr @ 0.5 to 1 + 0.25 to 0.5 lb/A	White clover, dandelion, henbit, chickweed, lespedeza, buck-horn plantain, ground ivy, wild violet, prostrate spurge.	Chaser 2 to 4 pt/A.	Postemergence to actively growing weeds.	For use on tall fescue, perennial ryegrass and perennial bluegrass. Do not use on other turf species unless injury can be tolerated. Wild violet and prostrate spurge control requires repeat applications.
amicarbazone @ 0.04 to 0.22 lb/A	Annual bluegrass, some broad-leaf weeds (see label).	Xonerate 2 SC 3 to 14 fl oz/A.	Postemergence. If necessary, repeat applications should be made at 14 to 21 day intervals.	Repeat applications should be perpendicular to the initial, minimizing overlaps in at least 20 GPA. Adding a NIS is optional. Bentgrass areas can be reseeded 7 days following the last application. Treat only when temperatures are between 55 and 80°F. Maximum use rate per season is 29 fl oz/acre.
asulam @ 2 lb/A	Crabgrass, goosegrass, sandbur.	Asulox 3.34 L 5 pt/A.	Postemergence to actively growing weeds.	For use in St. Augustinegrass sod production and Tifway 419 bermudagrass sod production only. Do not apply to freshly mowed turf or turf under stress. Do not use a surfactant.
bentazon @ 0.75 to 1 lb/A	Yellow nutsedge, purple nutsedge, annual sedges, and many broadleaf weeds.	Basagran T&O, Broadloom 1.5 to 2 pt/A.	Postemergence. Allow nutsedge to develop as much leaf area as possible.	Apply bentazon to emerged yellow nutsedge that is actively growing and under good soil moisture conditions. Apply 1.5 to 2 pt/A and follow 10 to 14 days later with an additional application if necessary. Do not exceed 4 pt/A (2 lb ai/A) per year. Thorough spray coverage is essential for acceptable control. Spot spraying may result in possible turf injury. DO NOT mow 3 to 5 days prior to or after application. DO NOT apply to golf course greens or collars.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
TURFGRASSES Postemergence - Established Grasses [cont.]				
bromoxynil @ 0.25 to 0.5 lb/A	Seedling broadleaf weeds with 4 true leaves or more.	Maestro 2EC or 4EC 1 to 2 or 0.5 to 1 pt/A.	When weeds are in the 2- to 4-leaf stage. Will not control larger weeds. Apply as summer or winter treatment to control seedling annual broadleaf weeds.	For use on nonresidential turf or sod farms ONLY. On newly sprigged or seeded grasses, DO NOT exceed 0.5 lb ai/acre of bromoxynil. Repeated applications spaced 2 weeks apart may be necessary for acceptable control of prostrate spurge. Bromoxynil is a contact herbicide and uniform spray coverage is essential. Do not use on centipedegrass.
carfentrazone @ 0.015 to 0.1 lb/A	Some broadleaf weeds (1.0 to 2.1 fl oz/A) and silvery thread moss (2.0 to 6.7 fl oz/A).	Quicksilver T&O 1.9 F 1.0 to 6.7 fl oz/A.	Postemergence. Repeat applications at 2 week intervals will extend duration of weed control.	Tall fescue may exhibit yellowing after application. Use a NIS at 0.25% (v/v).
carfentrazone + MCPP + 2,4-D + dicamba	Most broadleaf weeds.	SpeedZone 2 to 5 pt/A.	Postemergence to actively growing weeds.	Carfentrazone is a contact herbicide, which will cause rapid appearance of symptoms on target species. On warm season grasses, use 2-4 pt/A. See label for details.
carfentrazone + MCPA + MCPP + dicamba	Most broadleaf weeds.	PowerZone 2 to 6 pt/A.	Postemergence to actively growing weeds.	Carfentrazone is a contact herbicide, which will cause rapid appearance of symptoms on target species. Power Zone does not contain 2,4-D. On warm season grasses, use 2-4 pt/A. See label for details.
carfentrazone + quinclorac @ 0.5 to 0.8 lb/A	Numerous broadleaf weeds, yellow nutsedge, crabgrass and foxtail. Refer to label for complete listing.	Square One 70 WG 12 to 18 oz/A.	Postemergence to actively growing weeds.	Refer to comments for carfentrazone and quinclorac. Do not use on golf greens. Can be used 1 day before seeding or 7 days after seeding. May be safely applied to dormant warm season grasses. Actively growing warm and cool season grasses may show injury symptoms for 3 to 7 days after application.
clopyralid @ 0.09 to 0.5 lb/A	Legume species including kudzu, white clover, hop clover, bur clover, black medic. Also controls some composites.	Lontrel Turf and Ornamental 0.25 to 1.33 pt/A.	Postemergence during periods of active growth.	Avoid contact with any leguminous landscape plants such as mimosa, honey locust, redbud or littleleaf linden (<i>Tilia cordata</i>). St. Augustinegrass and centipedegrass have good tolerance for Lontrel.
dicamba @ 0.25 to 0.5 lb/A	Annual and perennial broadleaf weeds. Provides better control of henbit, knotweed, clovers, docks, woodsorrel, spurge and lespedeza than 2,4-D alone.	Banvel 4 L, Diablo 4L, Vanquish 4 L 0.5 to 2 pt/A. Clarity 4 L (sod farms only) 0.2 to 2 pt/A.	Apply in spring or fall when weeds are actively growing.	Do not apply over the root zone of ornamental trees and shrubs. Repeat applications may be needed. Do not exceed 1 lb/acre during the growing season. Do not apply to St. Augustinegrass.
dicamba + iodosulfuron + thiencazone @ 0.11 to 0.21 lb/A	Broadleaf weeds including medic, clover, geranium, speedwell, dandelion, dollarweed, doveweed, burweed, spurge and others and carpetgrass.	Celsius 68 WG 2.5 to 4.9 oz/A.	Postemergence to actively growing weeds.	Do not exceed 7.4 oz/A per year. Not for greens, collars or turf that is not established. Do not use on bahiagrass or cool-season grasses. Do not use within 14 days of seeding ryegrass or sprigging bermudagrass, or 30 days before seeding bermudagrass or zoysiagrass.
fenoxaprop @ 0.02 to 0.17 lb/A	Control of annual grassy weeds. Offers bermudagrass suppression.	Acclaim Extra 0.57 EC 3.5 to 39 fl oz/A.	Postemergence. Apply to actively growing weeds. Follow-up applications may be applied 2 weeks after the initial application.	Rate depends on growth stage of weeds. Use only on established Kentucky bluegrass, tall fescue, perennial ryegrass, red fescue and zoysiagrass.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
flazasulfuron @ 0.008 to 0.047 lb/A	Cool season grasses, fescue, annual bluegrass, ryegrass.	Katana 25 DF 0.5 to 3.0 fl oz/A.	Applications in late fall are optimal for treating smaller, less mature annual winter weeds.	Use only on bermudagrass, zoysiagrass, or centipedegrass. Do not apply on or upslope to desirable bentgrass or overseeded turf. Movement is encouraged when saturated soils are treated and/or heavy (>0.25-inch) rainfall occurs within 48 hours of application. Treated plants do not show herbicide symptoms until air temperatures are consistently above 60°F.
florasulam @ 0.013 lb/A	Control of many broadleaf weeds, including chickweed, prickly lettuce, clover, and others. Offers suppression of purple and yellow nutsedge.	Defendor 0.42 SC 4 fl oz/A.	Postemergence. If necessary, a second application should be made 4 weeks after the first.	Defendor has soil and foliar activity at cool temperatures and provides fall and early spring postemergence weed control. Add NIS at 0.25%(v/v) when applied alone.
fluazifop @ 0.05 to 0.25 lb/A	Bermudagrass suppression, crabgrass, goosegrass, dallisgrass.	Fusilade II EC 3 to 16 fl oz/A.	Postemergence. Best results in spring or Fall. Avoid applications in July and August.	Application to stressed turf or use of high rates may cause discoloration of turf. Follow-up applications should be made every 30 days, unless turf has not recovered. Use a NIS at 0.25% (v/v).
flumioxazin @ 0.375 lb/A	Winter annual broadleaf weeds, crabgrass preemergence.	SureGuard 51 WDG 12 oz/A. or SureGuard 4 SC 12 fl oz/A.	Dormant bermudagrass.	A contact product for dormant bermudagrass for rapid nonselective winter annual broadleaf control with subsequent preemergence crabgrass control. Best winter annual broadleaf control is with early winter (November and December) applications. Best preemergence crabgrass control is with late winter applications. Allow 8 weeks after application before seeding or sodding. BroadStar 0.25G is a granular formulation.
fluroxypyr @ 0.13 to 0.5 lb/A	Broadleaf weeds.	Vista XRT 6 to 23 fl oz/A.	Postemergence. Repeat applications should be timed at 4 week intervals to minimize injury to turf.	Avoid applications to warm season grasses as they are transitioning from winter dormancy. Lower rates should be used on creeping bentgrass, bermudagrass, and St. Augustinegrass. Check label for specific rate recommendations.
foramsulfuron @ 0.006 to 0.052 lb/A	Cool season grasses, goosegrass, centipedegrass.	Revolver 4.4 to 35.2 fl oz/A.	Postemergence to actively growing weeds.	For use on bermudagrass and zoysiagrass. Do not apply to areas where runoff water may come into contact with cool-season grasses. Add up to 1% v/v methylated seed oil surfactant.
glufosinate @ 0.75 to 1.5 lb/A	Existing vegetation.	Finale XL T&O 3 to 6 qt/A.	Postemergence. Apply to fully dormant turf or severe injury or delay in green-up will occur.	Do not use on cool-season turf. Can be used to edge or trim around trees, landscape beds, walkways, etc on golf courses and residential or commercial turf areas. May be broadcast or spot-sprayed. Product has limited translocation. Can also be used in dormant bermudagrass to control winter weeds. Addition of 8.5 to 17 lbs. of ammonium sulfate per 100 gal of water may improve control.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
TURFGRASSES Postemergence - Established Grasses [cont.]				
glyphosate @ 0.28 lb/A	Annual bluegrass.	Glyphosate (4 lb/gal formulations) 1 pt/A.	APPLY ONLY TO DORMANT BERMUDAGRASS OR BAHIAGRASS.	Apply in 10 to 20 gal water/acre. Add surfactant according to label directions. DO NOT apply during greenup or to actively growing bermudagrass. Do not apply to zoysiagrass at any time.
halosulfuron @ 0.031 to 0.062 lb/A	Yellow and purple nutsedge green kyllinga (suppression).	Prosedge, SedgeHammer 0.66 to 1.33 oz/A.	Postemergence to actively growing nutsedge, early to mid-June.	Apply to 3- to 8-leaf nutsedge. Use 0.5% nonionic surfactant. Two applications may be made. Do not exceed 0.125 lb/ai per acre in a single season. Do not apply to putting greens. For spot treatment, mix 0.9 grams of Manage in one gallon of water with 1/8 ounce surfactant. Do not mow for 2 days before and 2 days after application.
Imazosulfuron @ 0.38 to 0.66 lb/A	Suppression and control of kyllinga, purple nutsedge, yellow nutsedge, and various broadleaf weeds.	Celero 75 WDG 8 to 14 oz/A.	Postemergence. If necessary, a second application should be made 21 days after the first.	Do not apply to golf course putting greens. Add NIS at 25% (v/v). Do not apply to wet turf.
MCPA + mecoprop + dicamba	Annual and perennial broadleaf weeds. Controls a broader spectrum of weeds than 2,4-D alone.	Tri-Power, Trimec Encore, Triamine, others (See label for rates.)	Apply in spring or fall when weeds are actively growing.	Delay applications to newly seeded grasses until after 3-4 mowings. Delay reseeding for 4 weeks after treatment. Do not spray when turfgrass is emerging from winter dormancy. Do not spray on St. Augustine or centipede.
mesotrione @ 0.125 to 0.25 lb/A	Tufted lovegrass, preplant crabgrass, chickweed, speedwells and others.	Tenacity 4 L 4 to 8 fl oz/A.	Pre and postemergence.	Use on tall fescue and centipedegrass. May also be used on St. Augustinegrass grown for sod only. Do not apply to bermudagrass grown for sod unless injury can be tolerated. A postemergence (primary) herbicide with some preemergence activity. Apply at grass seeding in at least 30 GPA. Activate with 0.15-inch irrigation.
metribuzin @ 0.25 to 0.5 lb	Goosegrass, chickweed, henbit, parsley-piert, spurweed.	Sencor 75% 0.33 to 0.66 lb/A.	Apply to dormant turf for control of the winter annual complex. Apply to actively growing turf for control of goosegrass.	<i>Dormant bermudagrass:</i> Apply to emerged winter annual weeds before greenup of turf. Make only 1 application per season. <i>Actively growing bermudagrass:</i> Apply to bermudagrass that is actively growing and not under stressed conditions. Controls goosegrass and selected annual weeds. Repeat if necessary but do not apply closer than 1-week intervals. DO NOT make more than two applications per season. Metribuzin may cause temporary discoloration. Avoid spray overlaps that will increase rate above recommended rate. Delay mowing treated areas for at least 3 days.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
metsulfuron @ 0.009 to 0.038 lb/A	Many broadleaf weeds and bahiagrass.	Manor, Blade, MSM Turf, Mansion and others 0.25 to 1 oz/A.	Postemergence to actively growing weeds.	Safe for use on bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass. Will likely cause some temporary chlorosis. Add 0.25% nonionic surfactant. Do not exceed the 0.25 ounce rate on centipedegrass. To avoid damage to woody ornamentals through root uptake, do not apply more than 0.5 ounce per acre per treatment and do not make more than two applications per year. Treating zoysiagrass during transition may result in injury.
metsulfuron + rimsulfuron @ 0.015 + 0.018 lb/A	Most winter turfgrass weeds including broadleaf weeds and grasses.	Negate 37 WG 1.5 oz/A.	December-March.	For use on bermudagrass and zoysiagrass only. Do not use beneath desirable trees or ornamentals or on desirable bahiagrass. May injure zoysiagrass during transition. Do not use on residential turf. Leave a buffer around cool-season grasses. Add 0.5% nonionic surfactant.
MSMA @ 2 to 3 lb/A	Crabgrass and dallisgrass, sandbur and nutsedge suppression.	MSMA See label.	Two applications spaced 7 to 10 days apart are needed for acceptable control.	MSMA is labeled for use in sod farms and golf courses only. Not labeled for residential use, parks or other turf sites. 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 three mowings. Add a surfactant according to label directions. Zoysiagrass cultivars vary in tolerance to MSMA. 'Meyer' is more tolerant to MSMA than 'Emerald' or 'Matrella'. DO NOT apply to centipede or St. Augustinegrass.
MSMA + metribuzin @ 2 + 0.25 to 0.33 lb/A	Goosegrass.	MSMA + Sencor 75% See label.	Postemergence salvage application, usually done in July or August.	MSMA is labeled for use in sod farms and golf courses only. Not labeled for residential use, parks or other turf sites. 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.
pinoxaden @ up to 0.063 lb/A	Control of crabgrass and other grass weeds. Some suppression of dallisgrass at spot spray rate.	Manuscript Up to 19.2 fl oz/A. Add methylated seed oil surfactant (0.5 to 1% v/v).	Postemergence to actively growing weeds.	Labeled for bermudagrass and zoysiagrass. May also be use in St. Augustinegrass grown for sod only. Split applications of 9.6 fl oz/A at a 2-week interval are permitted. Instructions for spot spraying can be found on the label. Do not spot spray more than 10,000 sq ft per acre.
quinclorac @ up to 1.5 lb/A	Selective control of crabgrass, foxtails, and broadleaf weeds in many common turfgrasses.	Drive XLR 8 Up to 128 fl oz/A.	Postemergence to actively growing weeds.	Not labeled for golf course putting greens or collars. Add COC (2 pt/A) or MSO (1.5 pt/A) to increase performance. Generally safe to use on newly seeded turf, although adding a surfactant is not recommended on new seedlings. See label for details.
rimsulfuron @ 0.008 to 0.03 lb/A	Annual bluegrass, henbit, deadnettle, woodsorrel, and cool-season grasses.	TranXit 25 DF 0.5 to 2.0 oz/A.	See label for details.	Not labeled for residential lawns. Labeled for cool season grass control in non-overseeded bermudagrass, for transition of perennial ryegrass and annual bluegrass control before overseeding.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
TURFGRASSES Postemergence - Established Grasses [cont.]				
sethoxydim @ 0.19 to 0.28 lb/A	Large crabgrass, goosegrass.	Segment 1 EC 1.5 to 2.25 pt/A. Segment II 1.5 EC 1 to 1.5 pt/A.	Apply to actively growing large crabgrass before it is well tillered.	Postponing mowing for 7 to 14 days after application may improve weed control. Add 2 pt oil concentrate per acre or ¼ fl oz/1,000 sq ft. Centipede grass and fine fescue only.
sulfentrazone @ 0.125 to 0.375 lb/A	Kyllinga, yellow nutsedge and many broadleaf weeds.	Dismiss 4 F 4 to 12 fl oz/A.	Postemergence to actively growing weeds.	Safe on most warm- and cool-season turfgrasses. Maximum use rate on tall fescue is 4 fl oz/acre. Weed control spectrum increases when tank-mixed with 2,4-D and dicamba. Do not apply to golf course tees or greens. Do not apply directly to landscape ornamentals or ornamental beds.
sulfentrazone + imazethapyr @ 0.29 to 0.45 lb/A	Annual sedge, kyllinga, yellow and purple nutsedge.	Dismiss South 4 L 9.5 to 14.4 oz/A.	Postemergence to actively growing weeds.	Use only on well-established labeled turfgrass species. Do not use within 4 weeks of reseeding, overseeding or sprigging. Do not use on golf course greens or tees or directly to landscape ornamentals or ornamental beds. Suggested split application rate options are 9.5 oz followed by 4.9 oz/acre or 7.2 oz followed by 7.2 oz/acre with 35 days between applications.
sulfentrazone + metsulfuron @ 0.26 to 0.41 lb/A	Numerous broadleaf weeds, especially dollarweed, ground ivy, doveweed, wilt violet and some sedges (not purple). Refer to label for complete listing.	Blindside 66 WG 6.5 to 10 oz/A.	Postemergence to actively growing weeds.	Refer to comments for sulfentrazone and metsulfuron. Not for use on golf greens, collars or tees. A one-month seeding restriction follows use. Labeled for use in Bermuda, centipede grass, Kentucky bluegrass, St. Augustine grass, tall fescue, zoysiagrass. Use caution when applying this product on cool-season grasses, especially tall fescue.
sulfentrazone + quinclorac @ 0.75 to 1 lb/A	Numerous broadleaf weeds, yellow nutsedge, crabgrass, and foxtail. Refer to label for complete listing.	Solitare 75 WG 1 to 2 lb/A.	Postemergence to actively growing weeds.	Refer to comments for sulfentrazone and quinclorac. Not for use on golf greens, collars or tees. A one-month seeding restriction follows use. Bermudagrass, bluegrass, buffalograss, centipede grass, perennial ryegrass, seashore paspalum, tall fescue, zoysiagrass.
sulfosulfuron @ 0.035 to 0.094 lb/A	Johnsongrass, sedges including yellow, purple and kyllinga.	Certainty 75 DF 0.75 to 2 oz/A.	Postemergence to actively growing weeds.	Apply to 3- to 6-leaf sedges. Do not exceed 2.66 ounces per acre per year. Apply in boot stage to johnsongrass. Add 0.25% nonionic surfactant.
thiencarbazon + foramsulfuron + halosulfuron 0.038 to 0.12 lb/A	Nutsedge, goosegrass, see label for other weeds.	Tribute Total 1.0 to 3.2 oz/A.	Postemergence to actively growing weeds.	For use in bermudagrass and zoysiagrass only. Do not exceed 6.4 oz per year.
triclopyr @ 0.5 to 1.0 lb/A	Broadleaf weeds and bermudagrass suppression.	Turflon Ester 4 EC 1 to 2 pt/A.	Postemergence to actively growing weeds.	For use on tall fescue, perennial ryegrass and perennial bluegrass. Do not use on other turf species unless injury can be tolerated. Bermudagrass, wild violet, and spurge control require repeat applications.
triclopyr + clopyralid @ 0.56 to 1.88 + 0.094 to 0.188 lb/A.	White clover, dandelion, henbit, chickweed, lespedeza, buckhorn plantain, ground ivy, wild violet, prostrate spurge.	Confront 1 to 2 pt/A.	Postemergence to actively growing weeds.	For use on tall fescue, perennial ryegrass and perennial bluegrass. Do not use on other turf species unless injury can be tolerated. Do not treat warm-season grasses being mowed at less than 0.5-inch. Wild violet and prostrate spurge control requires repeat applications.

Crop, Situation, and Active Chemical Per Broadcast Acre	Weeds Controlled	Formulated Material Per Broadcast Acre	Time of Application	Method of Application and Precautions
trifloxysulfuron @ 0.015 to 0.026 lb/A	Cool-season grasses, Virginia buttonweed, sedges, white clover, dichondra, carpetweed.	Monument 75WG 0.33 to 0.56 oz/A. Recognition 1.29 to 1.95 oz/A	Postemergence to actively growing weeds.	For use on bermudagrass and zoysiagrass. For spot treatment, add 0.0176 ounce per gallon plus two teaspoons of surfactant. Use repeat applications for sedges. Do not apply to areas where runoff water may come into contact with cool-season grasses. Add 0.25% nonionic surfactant.
trifloxysulfuron @ 0.016 to 0.025 lb/A <i>PLUS</i> fluazifop @ 0.27 to 0.53 lb/A	Bermudagrass plus those listed for trifloxysulfuron and fluazifop.	Recognition 1.29 to 1.95 oz/A <i>PLUS</i> Fusilade II Turf and Ornamental 12 to 24 fl oz.A	Postemergence to actively growing weeds.	Recognition contains a safener that allows Fusilade to be applied safely in zoysiagrass and St. Augustinegrass. To control bermudagrass, repeat applications made 4 to 6 weeks apart will be necessary. Wait at least 4 weeks after sprigging, sodding, or seed emergence. Can be used on sod farms, golf courses, and residential and commercial turfgrass areas.
topramezone @ 0.021 to 0.031 lb/A	Crabgrass, goosegrass and other annual grasses.	Pylex 2.8 L 1.0 to 1.5 fl oz/A.	Postemergence to actively growing weeds.	May be used on centipedegrass and Kentucky bluegrass and tall fescue. Do not apply to St. Augustinegrass or zoysiagrass. A reduced rate may be used for selective control of goosegrass in bermudagrass. See label for detailed instructions.