

Post-emergence weed control in warm-season turfgrasses

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■ Unlike pre-emergence herbicides which must be applied at certain times of the year, post-emergence herbicides provide the turfgrass manager with viable options to control weeds over the entire year. A complete chemical weed control program can be based on post-emergence herbicides; however, most post-emergence herbicides usually cause temporary injury to turfgrasses. Therefore, the primary use of post-emergence herbicides is to supplement the level of weed control obtained with the use of pre-emergence herbicides.

Proper turfgrass maintenance is the first step in the development of a successful post-emergence weed control program. Adherence to recommended fertility programs, water requirements, mowing heights and schedules, and controlling diseases and insects will significantly increase turfgrass competition with weeds. It will also improve the effectiveness of the post-emergence weed control program.

Post-emergence herbicides offer several advantages relative to the use of pre-emergence herbicides:

- Can be applied as less expensive "spot treatments" or "as needed" directly to a weed infestation.

- Post-emergence herbicides control many problem annual and perennial weeds that are not controlled by pre-emergence herbicides.

- Low rates of most post-emergence herbicides may be used on newly sprigged or sodded warm-season turfgrasses. (most pre-emergence herbicides are recommended only for established turfgrasses.)

- In areas that are scheduled to be overseeded or renovated, the majority of post-emergence herbicides can be used prior to renovation. The time interval from application to seeding, sprigging or sodding operations for most pre-emergence herbicides varies from six weeks to 4 months.

Think first!

Numerous herbicides are available to control emerged weeds in warm-season turfgrasses (Table 1); however, several factors must be considered in selecting the

appropriate herbicide.

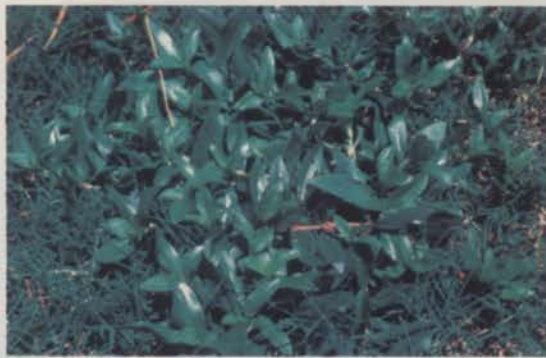
Turfgrass Tolerance: The single most important factor in selecting a post-emergence herbicide is the tolerance of the turfgrass to the herbicide. Warm-season turfgrasses differ in their tolerance to post-emergence herbicides (Table 2). For example, bermudagrass has good tolerance to MSMA and DSMA; however, carpetgrass, centipedegrass and St. Augustinegrass are severely injured by these herbicides. Additionally, cultivars within a species may respond differently to the same herbicide. 'Meyer' zoysiagrass has better tolerance to MSMA than 'Emerald' or 'Matrella'. The product label should always be consulted to determine if the herbicide may be used on a particular turfgrass species.

Weed Species: Correct weed identification is a prerequisite for the selection of an appropriate herbicide. Weed identification assistance is available at county Extension Service offices and through chemical company representatives. After the weed has been identified, the herbicide label should be reviewed to determine if the herbicide will control the problem weed. Also, reference to land grant university weed control guides may show the effectiveness of herbicides in controlling weed species that are not listed on the herbicide label.

Application Frequency: For some weed species and herbicides, a repeat application is necessary to effectively control the weed. For example, two applications of MSMA + Sencor, at a 7 to 10 interval, are necessary to control goosegrass. In contrast, one application of Illoxan will usually control goosegrass.

Ornamental Tolerance: Ornamentals may be injured by spray or vapor drift or by root absorption of the herbicide. Ester formulations of the phenoxy herbicides (2,4-D, dichlorprop) easily volatilize during warm temperatures and can injure sensitive ornamentals by vapor drift. Therefore, they should not be used during the warm months of the year on or near sites that contain ornamentals. Spray drift damage can be prevented by spraying when the wind velocity is less than 5 miles per hour, and selecting a nozzle tip and spray pressure that produces large spray droplets.

Due to their soil residual characteristics, atrazine (Aatrex) and dicamba (Banvel) and dicamba-containing herbicides can injure broadleaf ornamentals via root uptake, particularly on sandy soils if rainfall occurs immediately after applica-



Virginia buttonweed

tion. Avoid the use of these herbicides over the root zone of shrubs and small trees.

Suggestions for use

Apply post-emergence herbicides to small, actively-growing weeds.

Perennial and annual weeds that are growing under good soil moisture conditions at moderate air temperatures are easier to control with post-emergence herbicides than weeds that are stressed due to adverse environmental conditions. Target the application to coincide with good soil moisture conditions at air temperatures of 60 to 90° F. Applications on cold, wintery days, or to drought stressed weeds will result in poor weed control.

Post-emergence herbicide use should be avoided when turfgrasses and weeds are stressed due to high air temperatures or drought.

The tolerance of warm-season turfgrasses to post-emergence herbicides decreases at air temperatures greater than 90° F., when turfgrasses are drought stressed or when they are growing under high soil moisture and high relative humidity conditions. Herbicides that contain 2,4-D, dicamba, mecoprop, dichlorprop, imazaquin, MSMA and DSMA should not be applied at high air temperatures since there is an increased risk of unacceptable turfgrass injury. Always follow the most restrictive warning that is shown on the label. As previously mentioned, weed control is also poorer when herbicides are applied to environmentally stressed weeds than when applied to actively-growing weeds. Additionally, the tolerance of warm-season turfgrasses to herbicides is generally lower during spring green-up than when the turfgrass is dormant or after full green-up. Fortunately, research has shown that the decrease in turfgrass quality that may result from the use of post-emergence herbicides during green-up is temporary and persists for 2 to 6 weeks after application. If a dense weed population necessitates the use of a post-emer-

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POST-EMERGENCE HERBICIDES FOR WARM-SEASON TURFGRASS¹

Table 1.

Common Name	Trade Name(s)	Uses
asulam	Asulox	Grass weed control in St. Augustinegrass
atrazine	Aatrex, others	Pre- and post-emergence broadleaf and grass weed control
bentazon	Basagran T/O	Primarily used for yellow nutsedge control
bentazon + atrazine	Prompt	Yellow nutsedge/broadleaf weed control in centipedegrass, St. Augustinegrass, zoysiagrass
bromoxynil	Buctril	Broadleaf weed control on non-residential turf
2,4-D	numerous	
2,4-D + dicamba	Eight-One	Broadleaf weed control
2,4-D + dichlorprop	Weedone DPC Amine, Weedone DPC Ester	Broadleaf weed control
2,4-D + mecoprop	Lescopar, 2 Plus 2	Broadleaf weed control
2,4-D + mecoprop + dicamba	Trimec Classic, Trimec 992, Three-Way	Broadleaf weed control
2,4-D + mecoprop + dichlorprop	Weedestroy Triamine, Weedestroy Tri-Ester	Broadleaf weed control
dicamba	Banvel	Broadleaf weed control
diclofop-methyl ²	Illoxan	Goosegrass control in bermudagrass
diquat ³	Diquat	Winter annual weed control in dormant bermudagrass
DSMA	numerous	Grass weed control in bermudagrass and zoysiagrass
ethofumesate	Prograss	Pre- and early post-emergence annual bluegrass control in over-seeded bermudagrass, and common bermudagrass suppression in St. Augustinegrass
fenoxaprop	Acclaim	Annual grass control and suppression of bermudagrass in zoysiagrass
glyphosate	Roundup	Winter annual weed control in dormant bermudagrass and bahiagrass
imazaquin	Image	Purple nutsedge and wild garlic control in warm-season turfgrasses (except bahiagrass); also controls certain broadleaf weeds
mecoprop	Mecomec, Lescopex	Broadleaf weed control
mecoprop + 2,4-D + dicamba	Southern Trimec, Trimec Bent	Broadleaf weed control
MCPA + mecoprop + dicamba	Trimec Encore, Encore DSC	Broadleaf weed control
MCPA + mecoprop + dichlorprop	Weedestroy Triamine II, Weedestroy Tri-Ester II	Broadleaf weed control
metribuzin	Sencor Turf	Goosegrass control in bermudagrass. Also controls prostrate spurge and numerous winter annual broadleaf weeds
metsulfuron	DMC	Controls 'Pensacola' bahiagrass, wild garlic, prostrate spurge, many broadleaves
MSMA	numerous	Grass weed control in bermudagrass and zoysiagrass
MSMA + 2,4-D + mecoprop + dicamba	Trimec Plus	Grass and broadleaf weed control in bermudagrass, zoysiagrass
pronamide	Kerb	Annual bluegrass control in bermudagrass
sethoxydim	Vantage	Annual grass control and suppression of bahiagrass in centipedegrass

¹ Refer to the herbicide label for a complete listing of tolerant turfgrasses and labeled application sites.

² Diclofop-methyl has a state label for use in Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina and Texas.

³ Diquat has a state label in Arkansas, Louisiana, Mississippi, Oklahoma, Tennessee and Texas for winter annual weed control in dormant bermudagrass.

Source: Dr. Murphy

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Table 2. **WARM-SEASON TURFGRASS TOLERANCE TO POST-EMERGENCE HERBICIDES**

HERBICIDE	Bahiagrass	Bermudagrass	Centipedegrass	Carpetgrass	St. Augustinegrass	Zoysiagrass
asulam	NR-S	T ¹	NR-S	NR-S	I-T	NR
atrazine	NR-I	S(D)	T	NR-T	T	I
bentazon	T	T	T	NR-T	T	T
bentazon + atrazine	NR-I	NR-I	NR-T	NR-I	NR-T	NR-T
bromoxynil	T	T	T	NR-I	T	T
2,4-D	T	T	I	I-T	S-I	T
2,4-D + dicamba	T	T	S-I	I-T	S-I	T
2,4-D + diclorprop	T	T	I	I-T	S-I	T
2,4-D + mecoprop	T	T	S-I	I-T	S-I	T
2,4-D + MCPP + dicamba	I-T	I-T	S-I	I-T	S-I	T
2,4-D + MCPP + diclorprop	T	T	I	I	I	T
dicamba	T	T	I-T	T	S-I	T
diclofop-methyl	NR	T	NR	NR	NR	NR
DSMA, MSMA	NR-S	T	NR-S	NR-S	NR-S	I
fenoxaprop	NR-S	NR-S	NR-S	NR	NR-S	T
glyphosate	S(D) ²	S(D) ²	S	S	S	S
imazaquin	NR-S	T	T	NR-I	T	T
MCPA + MCPP + dichlorprop	T	T	I	I	I	T
mecoprop (MCPP)	T	T	S-I	I-T	S-I	T
metribuzin	NR-I	T	NR-S	NR-S	NR-S	NR-S
metsulfuron	NR-S	T	I-T	NR-I	I-T	NR-S
pronamide	NR	T	NR	NR	NR	NR
sethoxydim	NR-S	NR-S	T	NR-I	NR-S	NR-I

T = Tolerant at labeled rates
 I = Intermediate tolerance, use at reduced label rates
 S = Sensitive, do not use this herbicide
 D = Dormant applications are recommended

Source: Dr. Murphy

gence herbicide during green-up, use only the lowest recommended or one-half the recommended rate to minimize herbicide injury to the turfgrass.

Single applications at high rates generally cause more turfgrass injury than repeat applications at low rates.

Additionally, single, high rate applications often do not control perennial weeds. The repeat application is usually made at interval of 7 to 14 days after the first application, or when regrowth of the weed is noted.

Mowing schedules must be coordinated with post-emergence herbicide applications.

Generally, mowing should be delayed 3 to 4 days before or after a post-emergence herbicide application. The delay

prior to application will increase the leaf surface area of the weed and spray deposition. The delay after application is necessary to allow adequate time for herbicide absorption and translocation in the target weed species.

Do not apply post-emergence herbicides immediately before rainfall or irrigation.

Rainfall or irrigation immediately after application can wash the herbicide from the treated weed foliage and decrease control. On irrigated sites, watering drought stressed weeds one to two days before a post-emergence herbicide application will usually improve control of the problem weeds species.

Use surfactants and crop oil concentrates according to label directions.

The effectiveness of many post-emergence herbicides is enhanced by the addition of a crop oil concentrate or surfactant to the spray mixture, particularly under less than ideal spray conditions. However, indiscriminate use of surfactants or crop oil concentrates can increase the risk of turfgrass injury. The herbicide label should be reviewed to determine if the use of a surfactant or crop oil concentrate is recommended.

Calibrate all spray equipment and train the operator.

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