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Annual Bluegrass Control in Residential Turfgrass

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Annual bluegrass (*Poa annua* L.) is a problematic winter annual weed in residential turf. Compared to most turfgrasses, annual bluegrass has a lighter green color, coarser leaf texture and produces unsightly seedheads. Contrary to its name, both annual (live for one season) and perennial (live for many seasons) biotypes of annual bluegrass may be found in turf. Perennial biotypes are more prevalent on closely mowed turf that receives frequent irrigation and high nitrogen fertilization. Perennial biotypes will be more prevalent in shady or highly trafficked areas with compacted soil. While the two biotypes may not be easily distinguished from each other, annual types are more upright in growth and produce more seed than lower-growing perennial types.

Annual bluegrass seed germinates in late summer/early fall once soil temperatures fall below 70° F. Seedlings grow and mature in fall, overwinter in a vegetative state and produce seed in spring. Annual bluegrass is a prolific seed producer and individual plants may produce hundreds of viable seed, even when closely mowed. Annual bluegrass flowers over several months in spring and produces seed that may remain dormant in soil for years before germinating. Annual bluegrass grows well under short day lengths and cool conditions, and may out-compete other turf species during late fall and early spring. Annual bluegrass often dies from summer stresses but may survive if irrigated and if pests are adequately controlled, especially for perennial biotypes.

Cultural Control

Several cultural practices can be utilized to control annual bluegrass in residential lawns. Deep and infrequent irrigation encourages turfgrass root development, which may improve the ability of desired grasses to compete with annual bluegrass in mixed stands. Withholding water until desirable turfgrass species exhibit initial drought stress symptoms can help reduce soil moisture for potential annual bluegrass infestations. Overwatering, especially in shady areas, may predispose the site to annual bluegrass invasion.

Practices that promote soil compaction should be avoided to promote turfgrass growth and competition with annual bluegrass populations. Core aerifications should be conducted during active turf growth and favorable periods for quick recovery. Voids left in turf with exposed soil following aerifications may permit annual bluegrass invasion during periods of peak germination. For cool-season grasses, fall aerifications should be timed before annual bluegrass germinates. Warm-season grasses should have enough time to recover from summer aerifications to promote dense, high quality turf prior to annual bluegrass germination in fall.

Nitrogen fertilization should be reduced during peak annual bluegrass germination and periods of vigorous growth. High nitrogen at these times encourages annual bluegrass spread and survival into winter and spring. Fertilizing dormant turfgrasses when annual bluegrass is actively growing may also exacerbate infestations and should be avoided.

Mowing height, frequency and equipment requirements vary among turfgrass species and practitioners should maintain turf under appropriate regimens for successful long-term culture (Table 1). Raising the mowing height during peak annual bluegrass germination may encourage turf competition to reduce potential infestations. Lower mowing heights may predispose turf to stress and reduce competition with annual bluegrass populations. Turfgrass should also be mowed fre-

quently during periods of vigorous growth to prevent scalping. Scalping thins out turf and may enable weeds, such as annual bluegrass, to establish. While returning clippings is recommended to recycle nutrients to the soil, removal of clippings may be useful when annual bluegrass is present and producing seedheads. Removal of clippings at this time will reduce the spread of viable seed.

Chemical Control

Preemergence Control

Preemergence herbicides may prevent annual bluegrass seed germination. However, preemergence herbicides will not eradicate established plants and will not effectively control perennial biotypes of annual bluegrass from spreading vegetatively. Application timing of preemergence herbicides for annual bluegrass control is very important. Herbicides must be applied in late summer/early fall before annual bluegrass germination. A second application can be applied in winter to control later germinating plants. Fall-applied preemergence herbicides should not be used if reseeding or resodding is needed to repair areas of damaged turf within several months after herbicide applications.

Several preemergence herbicides used for summer annual weed control will effectively control annual bluegrass in fall and winter (Table 2). Fall applications of herbicides such as bensulide (Betasan), dithiopyr (Dimension), pendimethalin (Halts, Pendulum, others) and prodiamine (Barricade, others) may effectively control annual bluegrass. For herbicides, rates and application information, refer to the current edition of the *Georgia Pest Management Handbook*. Many preemergence herbicides are available under a wide variety of trade names and formulations and turf managers should carefully read label directions before applications.

Atrazine (Bonus, Purge, others) is labeled for centipedegrass, zoysiagrass, St. Augustinegrass and bermudagrass. Atrazine can be applied to actively growing and dormant centipedegrass or St. Augustinegrass but bermudagrass can be injured if treated while actively growing. Simazine (WynStar, others) may be applied to actively growing bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass lawns. Atrazine and simazine have excellent preemergence activity on annual bluegrass but soil residual is generally shorter (four to six weeks) compared to aforementioned herbicides. Several atrazine and simazine products are not labeled for residential lawns and turf managers should check labels for further information before use.

Most preemergence herbicides will provide similar initial efficacy if applied before annual bluegrass germination and sufficient rain or irrigation is received. Preemergence herbicides require incorporation from irrigation or rainfall so that weeds may absorb the applied material. In order to effectively control annual bluegrass, preemergence herbicides must be concentrated in the upper 0.25 to 0.33 inch of the soil profile. Retention on leaf tissue can be avoided by irrigating turf immediately after application for effective soil incorporation and herbicide activation.

Preemergence herbicide applications on non-irrigated sites have less potential for residual control, compared to irrigated turf, from product loss, poor soil incorporation and failure to activate the herbicide. Practitioners should return clippings on non-irrigated sites to help move potential herbicides remaining on leaf tissue to the soil. If clippings are collected as part of routine maintenance, practitioners should consider returning clippings until at least 1/2 to 1 inch of rainfall is received. Granular products may also be applied to non-irrigated sites for better soil incorporation than liquid formulations. Granular products may be easier to handle and apply with less equipment necessary than sprayable formulations. Granular herbicides should be applied when morning dew is no longer present to avoid interference from leaf tissue.

Postemergence Control

Annual bluegrass may be selectively controlled with postemergence herbicides (Table 3). Practitioners managing warm-season grasses have more options for selective postemergence annual bluegrass control than cool-season grasses. Foramsulfuron (Revolver) and trifloxysulfuron (Monument) are labeled for bermudagrass and zoysiagrass residential lawns and other sites (see the current edition of the *Georgia Pest Management Handbook*). Efficacy of these herbicides generally increases under warm temperatures in spring compared to winter and non-ionic surfactants may enhance efficacy.

Atrazine (Bonus S, others) may also be applied to dormant bermudagrass and actively growing centipedegrass, St. Augustinegrass and zoysiagrass for selective postemergence annual bluegrass control (see the current edition of the *Georgia Pest Management Handbook*). Atrazine may provide erratic control of annual bluegrass but may control other grassy and broadleaf weeds. Actively-growing bermudagrass is sensitive to atrazine and applications are recommended only during

the late fall and winter months. Simazine (WynStar, others) may be applied to actively growing bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass. Simazine provides excellent postemergence control of annual bluegrass during winter and spring months. See product labels for registered areas of atrazine and simazine products before using for postemergence annual bluegrass control.

Sulfosulfuron (Certainty) and metsulfuron (Blade or Manor) may control young annual bluegrass plants but do not control mature populations (see the current edition of the *Georgia Pest Management Handbook*). These herbicides are labeled for bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass. Sulfosulfuron can also be applied to bahiagrass and seashore paspalum. Repeat application may be required for complete annual bluegrass control in warm-season grasses.

Dormant bermudagrass may be treated with nonselective herbicides, such as glyphosate (Roundup, Touchdown, others), glufosinate (Finale) and diquat (Reward) (see the current edition of the *Georgia Pest Management Handbook*). These herbicides will injure or kill existing vegetation, including annual bluegrass, and managers should only spray at peak dormancy when no green turfgrass foliage is observable. Nonselective herbicides should only be applied to completely dormant bermudagrass. Applications during early spring may delay greenup with significant turf injury.

Selective annual bluegrass control options in cool-season lawns are limited. Ethofumesate (Prograss) controls established annual bluegrass in perennial ryegrass, tall fescue and dormant bermudagrass (see the current edition of the *Georgia Pest Management Handbook*). Two or three ethofumesate applications may be applied in late fall at three- to four-week intervals. Annual bluegrass control may be seen that fall, but control is usually observed the following spring. Annual bluegrass control with ethofumesate may vary greatly over years depending on environmental conditions. Spot treatments of nonselective herbicides are generally the most effective treatment regimen for annual bluegrass control in cool-season grasses.

Managing Herbicide Resistance

Annual bluegrass is a genetically diverse species and various biotypes present in turf may have differential responses to herbicides. Repeated use of one herbicide chemistry may effectively control annual bluegrass but resistance may develop in local populations if herbicides with different modes of action are not incorporated in to management regimens. Herbicide resistance is the survival of a segment of the population of weeds following a herbicide dosage lethal to the normal population. Resistance occurs from repeated use of the same herbicide or mode of action over years and may be a concern with problematic annual weeds, such as annual bluegrass.

Triazine herbicides, atrazine and simazine, have been popular products in residential turf due to the wide spectrum of weeds controlled as pre- or postemergence treatments. Resistance in weed populations has been reported with these herbicides and may contribute to inconsistent efficacy for annual bluegrass control in warm-season turf. Resistance to other chemistries used for annual bluegrass control, such as sulfonylureas and dinitroanilines, has been widely reported in weed populations and rotation of herbicides with different modes of action should be considered when planning annual bluegrass control programs in residential turf.

Table 1. Mowing requirements for residential turfgrasses in Georgia.

Species	Mowing Requirements for Turfgrasses		
	Mower Type	Height (inches)	Frequency (days)
Bermudagrass			
Common	Rotary/reel	1 to 2	5 to 7
Hybrid	Rotary/reel	0.5 to 1.5	3 to 4
Centipedegrass	Rotary	1 to 2	5 to 10
Perennial Ryegrass	Rotary/reel	0.5 to 2	3 to 7
St. Augustinegrass	Rotary	2 to 3	5 to 7
Tall Fescue	Rotary	2 to 3	5 to 7
Zoysiagrass	Reel	0.5 to 2	3 to 7

Table 2. Efficacy of preemergence herbicides for annual bluegrass control in residential turfgrasses.

Preemergence Herbicides	
atrazine	E
benefin	E
bensulide	F
dithiopyr	F-G
ethofumesate	G-E
oryzalin	G
pendimethalin	G
prodiamine	G-E
simazine	E
E = Excellent (90 to 100%), G = Good (80 to 89%), F = Fair (70 to 79%), P = Poor (<70%).	

Table 3. Efficacy of postemergence herbicides for annual bluegrass control in turfgrass.

Postemergence Herbicides	
atrazine	E
foramsulfuron	E
glufosinate	E
glyphosate	E
imazaquin	P-F
simazine	E
sulfosulfuron	P-F
trifloxysulfuron	E
E = Excellent (90 to 100%), G = Good (80 to 89%), F = Fair (70 to 79%), P = Poor (<70%).	

