

# TURFGRASS SCIENCE

at the University of Tennessee

## Bermudagrass (*Cynodon dactylon*) Control in Tall Fescue (*Festuca arundinacea*) and Zoysiagrass (*Zoysia* spp.) Turf

Greg Breeden, Extension Assistant, Turfgrass Weed Science  
 James T. Brosnan, Assistant Professor, Turfgrass Weed Science  
 Thomas J. Samples, Professor, Turfgrass Science and Management  
 Department of Plant Sciences

### Introduction

Bermudagrass (*Cynodon* spp) is commonly selected for use on Tennessee athletic fields and golf courses for its aggressive growth and tolerances to heat, drought and traffic stress. These characteristics also render bermudagrass an extremely difficult-to-control weed in tall fescue (*Festuca arundinacea*) and zoysiagrass (*Zoysia* spp.) turf. Infestations of bermudagrass in tall fescue and zoysiagrass commonly take the shape of distinct patches, easily identified by differences in color (during periods of active growth and dormancy; Figure 1) and leaf texture. In zoysiagrass turf, differences in morning dew patterns also help identify areas of bermudagrass contamination. Bermudagrass will invade any area of a tall fescue or zoysiagrass stand that has been weakened by diseases, insects, other types of weed competition or any type of stress.

### Bermudagrass Growth and Identification

Bermudagrass is a mat-forming perennial grassy weed that aggressively spreads by both rhizomes and stolons. This extensive network of below- (rhizomes) and above-ground (stolons) vegetative propagules makes bermudagrass extremely difficult to control. In many instances, bermudagrass can be desiccated on the soil surface with certain herbicide applications only to regenerate from below-ground rhizomes over time. Additionally, aggressive above-ground growth from stolons allows bermudagrass to advance into additional areas of desirable turf over time.

Bermudagrass can be misidentified for other grassy weeds. For example, similarities in leaf texture often cause many to wrongly identify bermudagrass populations as nimblewill (*Muhlenbergia shreberi*). However, bermudagrass has a hairy ligule (Figure 2), while the ligule of nimblewill is membranous. Bermudagrass also has a deeper root system than nimblewill and persists in drier, sunnier environments. Bermudagrass can also be confused with zoysiagrass; however, zoysiagrass leaves are rolled in the bud and often have hairs along the leaf blade, while bermudagrass has a folded vernation and contains no hairs on the leaf blade. Bermudagrass seedheads (Figure 3) have three to seven spikelets, which can be 1 to 2 inches long.



Figure 1. Dormant Bermudagrass in Tall Fescue



Figure 2. Bermudagrass Ligule



Figure 3. Bermudagrass Seedhead

## Cultural Practices to Prevent Bermudagrass Infestations

The best method of preventing bermudagrass infestations is to maintain a healthy, dense turf. Implementing the proper cultural practices required to maintain tall fescue and zoysiagrass turf will reduce the likelihood of bermudagrass encroachment. The following list contains some tactics that can be taken to discourage bermudagrass encroachment and spread in tall fescue and zoysiagrass.

1. Inspect all soil, compost, plant material and seed brought onto a property to be sure they are free of bermudagrass. Pay special attention to ensure that no vegetative structures (rhizomes, stolons) are present in these materials.
2. Increase mowing heights when possible. Increasing canopy height will improve turf rooting and photosynthesis, resulting in a healthier stand that is less susceptible to bermudagrass encroachment. Additionally, the taller canopy will shade any bermudagrass present in the stand, which will reduce its ability to spread.
3. Maintain proper fertility. For tall fescue, fertilize two times annually, once in the spring and once in the fall. Always avoid fertilizing tall fescue during the summer. For zoysiagrass, fertilize during the summer to deliver less than 3 lbs nitrogen/M/year. Zoysiagrasses have lower nitrogen requirements than bermudagrass. Thus, fertilizing at the proper rate will maintain adequate density while reducing the likelihood of bermudagrass encroachment and discouraging the spread of any bermudagrass present in the stand.
4. Water deeply and infrequently. Irrigate to a depth of about 6 inches, approximately twice a week. Shallow, frequent irrigation favors bermudagrass.
5. Pay attention to flower beds and other landscaped areas. Keep these areas free of bermudagrass contamination. Use heavy mulch or deep edging to keep bermudagrass from establishing. Edging material should be at least 6 inches into the soil. For more information on the proper cultural

practices used to maintain tall fescue and zoysiagrass turf in Tennessee, see UT Extension publication PB1038, *Lawn Fertilization and Management*. Additional information can also be found at <http://tennesseeturf.utk.edu>

## Herbicide Options for Bermudagrass Control

There are limited herbicide options for controlling bermudagrass in tall fescue and zoysiagrass (Table 1). Be aware that if successful, there will be numerous voids (bare areas) in the turf canopy after bermudagrass has been removed. These voids will be susceptible to future weed infestations and should be re-seeded with a high-quality turfgrass cultivar. Check the product label for information regarding the time required between seeding and applying a herbicide. In many instances, a single application of the herbicides listed below will cause severe bermudagrass injury, causing a void to develop in the canopy; however, bermudagrass can usually grow out of this injury over time. Thus, multiple herbicide applications and proper cultural implementations will be required to achieve complete control.

### Option #1- Fusilade II Program

Make sequential applications of Fusilade II at 3-6 oz/acre + Turflon Ester at 32 oz/acre, on four-week intervals, for bermudagrass control in tall fescue and zoysiagrass turf. Do not apply Fusilade II if the desired turfgrass is under any type of stress, due to the increased potential for herbicide injury. These applications will need to be applied throughout multiple growing seasons to obtain complete control.

**Table 1. Herbicides for Bermudagrass Control**

Options for control	Active Ingredient (Trade Name Ex.)	Formulations	Rate/a	Comments
Fusilade II Program	fluazifop (Fusilade II) + triclopyr (Turflon Ester)	2L + 4L	3-4 oz + 32 oz in Zoysiagrass 5-6 oz + 32 oz in Tall Fescue	Apply at 4-week intervals for bermudagrass management. Do not apply Fusilade II if turf is under stress.
Acclaim Extra Program	fenoxaprop (Acclaim Extra) + triclopyr (Turflon Ester)	0.59L + 4L	20-28 oz + 32 oz	Apply at 4-week intervals for bermudagrass management. Do not apply Acclaim Extra if turf is under stress.
Glyphosate Spot Treatment Programs	glyphosate (Roundup Pro, others)	Various	See Label	Glyphosate applications will control all desirable turf contacted, so caution should be used. Bare areas created by this application will need to re-seeded to prevent future infestations.

**Option #2- Acclaim Extra Program**

Sequential applications of Acclaim Extra at 20-28 oz/acre + Turflon Ester at 32 oz/acre, on four-week intervals, are labeled for bermudagrass suppression in tall fescue and zoysiagrass turf. Research at the University of Tennessee has observed that programs incorporating Acclaim Extra tend to be less effective than those delivering Fusilade II. Do not apply Acclaim Extra if the desired turfgrass is under any type of stress, due to the increased potential for herbicide injury to occur. These applications will need to be applied throughout multiple growing seasons to obtain complete control.

**Option #3- Glyphosate Spot Treatment Programs**

Spot treatments of glyphosate (Roundup Pro or similar) can be utilized to control bermudagrass in an array of different warm- and cool-season species. Precise applications are required, as glyphosate, a non-selective herbicide, will kill any desirable turf that it contacts in addition to weedy areas of bermudagrass contamination. Bare areas present after application will need to be reseeded to prevent future weed infestations and improve the overall aesthetic quality of the turf stand.

**Final Thoughts**

Controlling bermudagrass in warm- and cool-season turf is difficult. All herbicide programs involve making sequential applications over multiple growing seasons for complete control. In situations where bermudagrass covers a large percentage of a given turfgrass area, complete renovation should be considered over selective removal. For more information on renovating tall fescue turfs, see UT publication W238, *Weed Control During the Seeded Establishment of Cool-Season Grasses*.

Always refer to the product label for specific information on proper product use, tank-mix compatibility and turfgrass tolerance. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science Web site, <http://tennesseeturfgrassweeds.org>