Patches of bermudagrass in tall fescue and zoysiagrass are easily identified by differences in color and leaf texture (above, dormant bermudagrass in a tall fescue lawn).

Bermudagrass control in tall fescue and zoysiagrass

In situations where Bermudagrass covers a large percentage of a given turfgrass area, complete renovation should be considered over selective removal.

By Greg Breeden, James T. Brosnan, Thomas J. Samples

Bermudagrass (*Cynodon spp*) is commonly selected for use on Tennessee athletic fields and golf courses for its aggressive growth (providing fast recovery from wear and tear) and tolerances to heat, drought and traffic stress. These same characteristics, however, also render Bermudagrass an extremely difficult-to-control weed in tall fescue (*Festuca arundinacea*) and zoysiagrass (*Zoysia spp.*) stands.

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) 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

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Bermudagrass has a hairy ligule.

Bermudagrass seedheads have three to seven spikelets.

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 over time from below-ground rhizomes. Additionally, aggressive above-ground growth from stolons allows bermudagrass to advance into additional areas of desirable turf.

Bermudagrass can be misidentified as 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, 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 has no hairs on the leaf blade. Bermudagrass seedheads have three to seven spikelets, which can be 1 inch to 2 inches long.

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. For 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.

Additional tactics, including the following, can be taken to discourage Bermudagrass encroachment and spread in tall fescue and zoysiagrass.

Inspect all new materials. Inspect all soil, compost, plant material and seed brought onto a property to be sure that they are free of Bermudagrass. Pay special attention to ensure that no vegetative structures (rhizomes or stolons) are present in these materials.

Increase mowing heights when possible. Increasing the canopy height will improve the rooting and photosynthesis of the desirable turf, 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.

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.

Water deeply and infrequently. Irrigate to a depth of about 6 inches, approximately twice a week. Shallow, frequent irrigation favors Bermudagrass.

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.

HERBICIDE OPTIONS FOR BERMUDAGRASS CONTROL. There are limited herbicide options for controlling Bermudagrass in tall fescue and zoysiagrass. Be aware that if the applications are successful, numerous voids (bare areas) will be left 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 herbicide 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 NO. 1 — FUSILADE II FLUAZIFOP PROGRAM. Make sequential applications of Fusilade II at 3–6 oz./acre + Turflon Ester at 32 oz./acre, on 4-week intervals, for Bermudagrass control in tall fescue and zoysiagrass turf. Sequential applications of fluazifop are labeled for Bermudagrass control in tall fescue and zoysiagrass. Research has shown that tank-mixing fluazifop with triclopyr will improve weed control efficacy and reduce undesirable turf injury. Do not apply Fusilade II applications when the desired turfgrass is under any type of stress, due to the increased potential for herbicide injury.

Recent research at The University of Tennessee has found that Bermudagrass is most susceptible to these treatments when transitioning into winter dormancy in fall and in spring once green tissue is present. Often the process of transitioning into winter dormancy can begin before visual signs of the transition (i.e., changes in turf color) are apparent. We've observed that applications of fluazifop + triclopyr are most effective once the average daily air temperature falls below 72F. These applications treatments will need to be applied throughout multiple growing seasons to obtain complete control.

OPTION NO. 2 — ACCLAIM EXTRAFENOXAPROP PROGRAM. Sequential applications of Acclaim Extra at 20–28 oz./acrefenoxaprop + Turflon Estertriclopyrat 32 oz./acre, on 4-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 Extrafenoxaprop tend to be less effective than those delivering Fusilade IIfluazifop. Do not apply Acclaim Extrafenoxaprop 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 NO. 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, since 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 website, http://tennesseeturfgrassweeds.org. **GCI**

Greg Breeden is extension assistant, Turfgrass Weed Science; James T. Brosnan, Ph.D., assistant professor, turfgrass weed science; Thomas J. Samples, Ph.D., professor, turfgrass science and management, Dept. of Plant Sciences, The University of Tennessee.