# *Developing Best Management Practices for Bermudagrass Control in Zoysiagrass Fairways*

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**Objectives:**

1. Determine the optimal timing and rate of fluazifop with or without triclopyr to provide a selective bermudagrass control application in zoysiagrass turf.

**Start Date:** 2007
**Project Duration:** two years
**Total Funding**: $20,000

When managing zoysiagrass (*Zoysia spp.*) in a golf course setting, one of the most problematic weeds to control is bermudagrass (*Cynodon dactylon*). As more golf courses in the transition zone convert their old bermudagrass fairways to newly available cultivars of seeded and vegetative zoysiagrass, controlling bermudagrass contamination is a concern. Both species are warm-season grasses that react similar to herbicide treatments. Traditional nonselective herbicide applications result in the death of both the weed and desired turf, leaving areas of the fairway unplayable. Further, glyphosate applications are normally unsuccessful due to bermudagrass's ability to regrow from underground rhizomes and out compete the slower establishing zoysiagrass.

Managing zoysiagrass requires a selective herbicide application that will allow for bermudagrass control with minimal zoysiagrass injury. Aryloxy-phenoxypropionate herbicides have been used for post-emergence control of bermudagrass but were reported injurious to zoysiagrass. Resent research has indicated that tank-mixing the aryloxyphenoxypropionate herbicide fluazifop with triclopyr was safe to apply on zoysiagrass while maintaining bermudagrass suppression. Additional research was conducted to determine the optimal timing and rate of fluazifop with or without triclopyr to provide a selective bermudagrass control application in zoysiagrass turf.

A timing and rate study of fluazifop alone or tank-mixed with triclopyr was initiated in 2007 on 'Compadre' zoysiagrass (*Zoysia japonica* Steud.) at the University of Tennessee East Tennessee Research and Education Center - Plant Sciences Unit in Knoxville, TN and on 'Palisade' zoysiagrass [*Zoysia japonica* (L.) Merr.] at the Little Course in Franklin, TN. At both locations, plot units measured 5 by 10 ft. and were arranged in a randomized complete block design. Herbicide applications were applied at 3 mph with a $CO_2$-pressurized sprayer calibrated at 30 gal./acre with four XR Tee Jet 11002 VS nozzles at 9.5-inch spacings. A total of 17 treatments with increasing rates of fluazifop and fluazifop plus triclopyr were applied at either 2- or 4-week intervals. Herbicide rates were 6, 9, 12, or 15 oz./acre of fluazifop alone or 6, 9, 12, or 15 oz/acre of fluazifop plus 32 oz./acre of triclopyr.

*Fluazifop alone at 6, 9, 12, and 15 oz/acre causes unacceptable injury and turf quality. However, fluazifop is safe to apply up to 15 oz/acre at 4-week intervals when tank-mixed with triclopyr.*

Trials were visually rated every two weeks. Zoysiagrass injury was rated on a scale of 0-100%. A plot with the rating of 0% would equal no visual injury, while a plot with the rating of 100% would equal complete plant death. For points of discussion, a plot with > 20% injury was considered to be at an unacceptable level. Turfgrass quality was rated on a scale of 0-9. A plot with a 0 rating would be considered the poorest quality, a plot with a 7 rating would be considered standard golf course quality turf, and a 9 rating would denote optimal turfgrass quality. Visual ratings continued until the 16th week after initial application.

Digital color analysis of each treatment was taken every 2 weeks starting at the 6-week application. Images were analyzed for percent green turf cover, hue, saturation, and brightness values until the 16th week after initial application. Trials will be replicated again in 2008 on 'Meyer' (*Zoysia japonica*) zoysiagrass and 'Diamond' [*Zoysia matrella* (L.) Merr.] zoysiagrass.

At two-week intervals (0, 2, 4, 6 weeks after initial), all rates of fluazifop alone injured zoysiagrass to unacceptable levels (>20%) and reduced turf quality (<7). When tank-mixed with triclopyr, fluazifop at 6 and 9 oz./acre injured zoysiagrass acceptably, retained acceptable turf quality (>6), but decreased percent green cover. The higher rates of fluazifop at 12 and 15 oz./acre showed safening when compared to fluazifop rates alone but injured the zoysiagrass unacceptably (>20%) and reduced turf quality.

At four-week intervals (0, 4, 8, 12 weeks after initial), all rates of fluazifop alone injured zoysiagrass to unacceptable levels (>20%) and reduced turf quality (<7). When tank-mixed with triclopyr, all rates of fluazifop applied at four-week intervals were safe to apply to zoysiagrass and increased turfgrass quality.

## Summary Points

- Fluazifop alone at 6, 9, 12, and 15 oz./acre causes unacceptable injury and turf quality.
- Fluazifop is safe to apply up to 15 oz./acre at 4-week intervals when tank-mixed with triclopyr.
- Fluazifop tank-mixed with triclopyr improved turf quality when applied at 4-week intervals.