

# Application Timing Affects the Efficacy of Herbicides used for Control of Bermudagrass in Zoysiagrass Fairways

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## Objectives:

1. Determine the effects of application timing on the level of bermudagrass suppression achieved following applications of Fusilade II + Turflon Ester.

Start Date: 2009

Project Duration: two years

Total Funding: \$6,000

Zoysiagrasses offer increased density, improved shade tolerance, and reduced fertility requirements compared to other species historically used on golf course fairways in the transition zone. Consequently, the use of zoysiagrass in the transition zone is increasing.

One of the most troublesome weeds to control in zoysiagrass is common bermudagrass (*Cynodon dactylon*), as physiological similarities between these species often render them susceptible to the same herbicide chemistries. Although research has shown that applications of fluazifop (Fusilade II) mixed with triclopyr (Turflon Ester) can provide bermudagrass suppression with minimal zoysiagrass injury, superintendents still struggle to control bermudagrass infestations in zoysiagrass fairways.

Research was initiated in 2009 at the East Tennessee Research and Education Center in Knoxville, TN on a stand of 'Zenith' zoysiagrass infested with common bermudagrass. Plots measuring 5' X 5' were arranged in a 4 X 6 factorial design replicated three times. Herbicide treatment and application timing served as factors in this study.

The four herbicide treatments evaluated were: (1) fluazifop at 6 fl oz/A + triclopyr at 32 fl oz/A; (2) fluazifop at 12 fl oz/A + triclopyr at 32 fl oz/A; (3) fluazifop at 18 fl oz/A + triclopyr at 32 fl oz/A; and (4) untreated check. These treatments were applied at 6 timings: 200 growing-degree-days (GDD), 450 GDD, 825 GDD, 1,275 GDD, 1,775 GDD, and 2,250 GDD. Yearly accumulated GDD were calculated beginning on January 1.

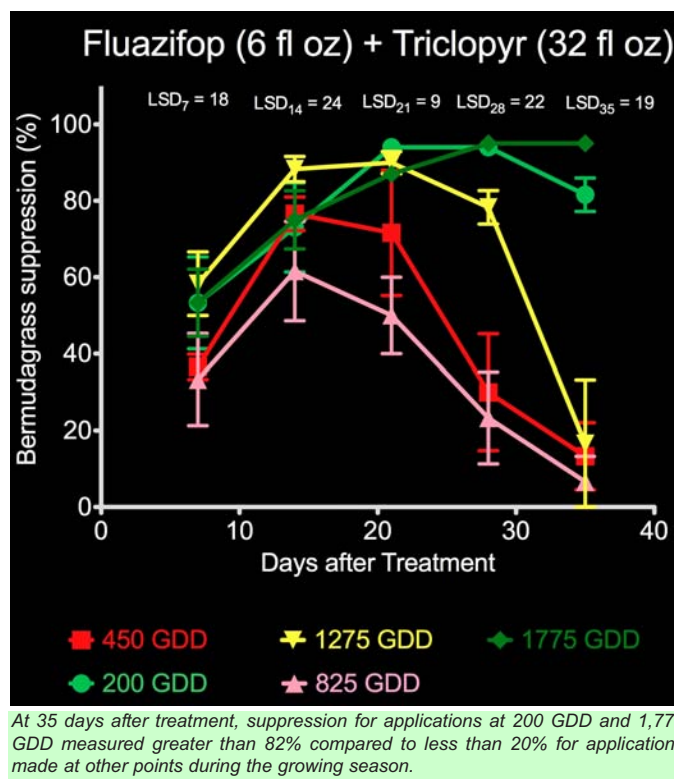
Bermudagrass suppression and zoysiagrass injury were assessed weekly using a visual scale from 0 (no injury; vigorously growing, green turf) to 100% (severely injured, necrotic, brown turf)

until suppression/injury subsided. Bermudagrass suppression and zoysiagrass injury were also assessed quantitatively by collecting relative chlorophyll index data with a hand-held chlorophyll meter.

While this experiment is still ongoing, current results indicate that bermudagrass is most susceptible to applications of fluazifop and triclopyr surrounding periods of dormancy. The greatest degree of suppression was observed for applications made to bermudagrass transitioning out of winter dormancy (200 GDD) in spring and entering winter dormancy (1,775 GDD) in fall.

At 35 days after treatment, suppression for applications at 200 GDD and 1,775 GDD measured greater than 82% compared to less than 20% for applications made at other points during the growing season. This response was observed for all fluazifop + triclopyr treatments evaluated. Increasing the rate of fluazifop from 6 to 18 fl oz/A did not improve the efficacy of treatments at 200 GDD and 1,775 GDD.

While the maximum-labeled use rate of fluazifop for bermudagrass suppression is 6 fl oz/A, 'Zenith' zoysiagrass exhibited tolerance to higher application rates. With the exception of treatments applied in spring (200 GDD, zoysiagrass injury measured less than 15% for all fluazifop rates evaluated. Regardless of fluazifop rate, spring (200 GDD) applications induced greater zoysiagrass injury at 7 days after treatment than any other timing.



Preliminary results suggest that superintendents should structure herbicide programs for bermudagrass control to deliver treatments when this species is transitioning into or out of winter dormancy. This study will be repeated in 2010 to confirm treatment responses observed in 2009.

## Summary Points

- Preliminary results suggest that bermudagrass is most susceptible to applications of fluazifop and triclopyr when transitioning out of winter dormancy in spring or transitioning into winter dormancy in fall.
- 'Zenith' zoysiagrass exhibited tolerance to rates of fluazifop greater than 6 fl oz/A in 2009.
- In 2009, increasing the rate of fluazifop above 6 fl oz/A did not improve efficacy for treatments applied to bermudagrass transitioning out of winter dormancy in spring or transitioning into winter dormancy in fall.