

Influence of Nitrogen Fertility and Mowing Height on Zoysiagrass Management

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Objectives:

1. Characterize a general response (color, density, turf quality, thatch accumulation, and disease incidence) to nitrogen fertilization, mowing, and their interactions among zoysiagrass cultivars.
2. Determine how nitrogen source affects the turf quality, density, and color of zoysiagrass cultivars.
3. Establish appropriate mowing height and fertility recommendations for each of the cultivars studied.

Start Date: 2008

Project Duration: three years

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Zoysiagrass (*Z. japonica* or *Z. matrella*) is increasing in popularity and availability with over 30 cultivars now commercially available. Zoysiagrass has historically been more widely utilized on golf courses in the upper transition zone. However, there has been a recent trend to plant zoysiagrass on golf courses in the lower transition zone and farther south. While use has increased, zoysiagrass is typically considered an alternative turfgrass for golf courses. Knowledge regarding the management of these new cultivars is critical as they are marketed and recommended for use.

Previous research in Texas found that turfgrass quality during summer was improved with higher nitrogen (N) rates, especially at the lower mowing height. Additional research has focused on mowing heights or fertility, but not a combination of the two. In South Carolina, *Z. matrella* had excessive thatch and scalping at high N rates (great than 3 lbs N/1000 ft²), but thatch was not problematic in *Z. japonica*. Others concluded that 2 lb N/1000 ft² or less during the growing season was adequate in Missouri.

Experimental areas were sprigged in 2001 at the Arkansas Agricultural Research and Extension Center, Fayetteville, AR with 'El Toro', 'Meyer', and 'Cavalier' zoysiagrass. Plots were maintained from 2002-2007 using 1-2 lb N/1000 ft²/year. Fertilization treatments were initiated in May 2008 using sulfur-coated urea at 0, 2, 4, and 6 lbs N/1000 ft²/year applied on May 1, June 1, July 1, August 1, and September 1. Response was evaluated as turf quality, density, green-up, and scalping.

Separate areas of established 'Meyer' and 'Cavalier' zoysiagrass were



University of Arkansas scientists apply fertilizer treatments to field plots of zoysiagrass in Fayetteville, AR. Results of these studies indicate that there is no advantage to using more than 2 lbs N/1000 ft²/year.

used at the same location. Three nitrogen sources, urea, ammonium nitrate, and calcium nitrate, were applied as 2.0 and 4.0 lbs N/1000 ft²/year with each source. Application timings were the same as Study 1. Response was evaluated as turf color, quality, density, green-up, and scalping.

Results indicate that turf density is improved through cultivar selection and N fertility. 'Cavalier' consistently had greater turf density than 'Meyer' and 'El Toro'. Increasing annual nitrogen applications to at least 2 lbs N/1000 ft² also improved turf density. In the spring of 2009, N rates to at least 4 lbs N/1000 ft²/year were observed to cause a delay in spring green-up and a decline in turf quality at the 1.5-inch mowing height. Turf quality was generally highest for 'Meyer' and 'Cavalier'. Turf quality was never unacceptable (less than a 6 rating) for the unfertilized check plots in either year. Nitrogen source did not impact turf quality, turf density, or turf color in the field trial.

In Arkansas, a survey indicated that some golf course superintendents were using upwards of 3.5 lbs N/1000 ft²/year to

maintain zoysiagrass fairways. Results for this study indicate that there is no advantage to using more than 2 lbs N/1000 ft²/year.

Summary Points

- Turf density was greatest for 'Meyer' and 'Cavalier' compared to 'El Toro'. Turf density was improved when fertilizing with at least 2 lbs N/1000 ft²/year.
- Spring green-up was highest for 0.5-inch mown plots. Among 1.5-inch mown plots, higher nitrogen rates (at least 4 lbs N/1000 ft²/year) decreased spring green-up.
- Scalping was greatest when mowing at 0.5-inch and fertilizing with 6 lbs N/1000 ft²/year.
- Turf quality was generally highest for 'Meyer' and 'Cavalier'. Turf quality was highest in the spring, among 1.5-inch mown plots, when receiving less than 4 lbs N/1000 ft²/year.
- There was no advantage to fertilizing more than 2 lbs N/1000 ft²/year. Turf quality was never unacceptable for the unfertilized check plots.
- Nitrogen source did not affect turf quality in the field.