INFLUENCE OF NITROGEN ON WINTER COLOR OF TWO NEW ZOysiAGRASSES

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It was the objective of a long-term turfgrass breeding program at the University of California, Riverside to improve zoysiagrass for turfgrass use in temperate and warm-season turfgrass climate zones. Improvement was characterized as increased turfgrass quality and extended green color retention into, or throughout, the winter season of Southern California where most warm-season turfgrasses go dormant. Two new zoysiagrasses have been developed from this ten-year program. DeAnza and Victoria zoysiagrasses are finer textured than El Toro, a previously released cultivar, and have been shown to hold green color into the cool temperature times of the year.

Improving the winter color retention through plant breeding is one method to have a warm-season turfgrass stay green year round, and manipulating cultural practices is a second method. Specifically, it has been shown experimentally and demonstrated in practice that fall fertilization with nitrogen can enhance winter color in warm-season turfgrasses. Also, studies demonstrated that iron may be useful to lessen color loss with bermudagrass in the fall. Therefore, it was the objective of a study conducted in the fall/winter of 1993-94 to evaluate the influence of nitrogen sources, rates, and application timing and iron fertilization on the green color retention of DeAnza and Victoria zoysiagrass, with the study being conducted at the Turfgrass Research Facility at the University of California, Riverside.

The same nitrogen and iron treatments were applied to mature stands of DeAnza and Victoria zoysiagrass on November 4, 1993. Ammonium sulfate and calcium nitrate at 0.5 lbs. per 1,000 sq. ft. of nitrogen every two weeks and the same materials at 1.0 lb. per 1,000 sq. ft. of nitrogen every four weeks were applied as granular materials with and without ferrous sulfate at the rate of 1 oz. per 1,000 sq. ft. every two weeks and 2 oz. per 1,000 sq. ft. every month. Isobutylidene diurea, IBDU, was applied at 2 lbs. of nitrogen per 1,000 sq. ft. every eight weeks, also with and without iron. Control treatments received no nitrogen with iron and no nitrogen without iron. The treatments were rated approximately weekly from mid-November through the end of January and in February, March, and April 1994. A visual rating system was used to determine color and the results were analyzed by recording date.

It was found that both grasses held some green color throughout the winter season without any fertilizer treatments, however, the color retention was weak. DeAnza responded very strongly to nitrogen fertilization, especially with ammonium sulfate and calcium nitrate, by giving consistently very acceptable winter color ratings, that equalled the commonly used cool-season species. There was little difference noted between the rate/timing with these rapid release products. Both gave better winter color than the slow release IBDU. It was also noted that iron, irrespective of rate, did not significantly influence the color of DeAnza.

In contrast, nitrogen alone had much less influence on the winter color retention of Victoria zoysiagrass. Ammonium sulfate, calcium nitrate, and IBDU treated plots were only slightly better in color during the lowest temperature times than the untreated control. Significant color improvement was noted with all iron treatments alone and especially in combination with the soluble nitrogen fertilizers.

In conclusion, this preliminary study has indicated that desirable winter color of a warm-season turfgrass can be achieved by the use of cultivars that have been selected for, or are characterized by, color retention at low temperatures, when fertilized with soluble nitrogen sources (DeAnza) or soluble nitrogen and iron (Victoria).