little if any fertilizer nitrogen will be required. This would all but eliminate nitrate leaching from turf and produce turf with a larger, stronger root system that would be more tolerant of drought, and root-feeding insects. This research could greatly increase the over-all efficiency of turfgrass management. ■

## Management Practices for Golf Course Roughs, Fairways, and Tees using Buffalograss

**University of Nebraska**

*Terrance Riordan*

Start Date: 1998
Number of Years: 3
Total Funding: $75,000

Objectives:

1. *Develop fertilization, mowing, irrigation, and pesticide recommendations for new buffalograsses.*
2. *Evaluate effect of cultivation on buffalograss.*
3. *Evaluate management for wear and divot recovery on buffalograss.*
4. *Use quantitative measures of turfgrass quality and recovery.*
5. *Study population changes in seeded cultivars due to management changes.*

**Evaluation for Low-mowing and Wear tolerance.** Under low mowing and no wear the female clone *92-135*, which outperformed all other entries in 1997, performed very well again in 1998 along with the female clone *92-31*. However, two male clones, *92-141* and *92-116*, had the best overall performance in 1998. All seed established experimentals exhibited average color and quality characteristics. The trial had a number of promising male and female clones. Wear results indicated that male and monoecious clones exhibited the most damage, while wear tolerance of female cultivars was significantly better than males, but not as good as for mixed seeded types.

**Fertility and Mowing Effects on Buffalograss.** At the Nebraska site, *NE 91-118* and *378* had the highest quality ratings at the 2.5 cm mowing heights for years 1996-1998. *CODY* and *TEXOKA* had poor quality ratings at the 2.5 cm mowing height for all years. In 1998, *NE 91-118*, *378*, and *CODY* had the highest quality ratings at the 5.1 cm mowing height. At the 7.6 cm mowing height, *CODY* and *TEXOKA* had the highest quality rating in 1997 but *CODY* and 378 had the highest quality ratings in 1998.

From 1997 to 1998, several trends were evident. First, turfgrass quality decreased from 1997 to 1998 for all cultivars at the 0, 2.4, and 5.0 g N $m^{-2}$ rates. At 10 g N $m^{-2}$, *NE 91-118* and *378* had higher quality in 1998 than in 1997. All cultivars had improved quality ratings in 1998 at the 20 g N $m^{-2}$ rate. Quality ratings in 1998 were poor (< 6) for all cultivars at 0, 2.4, and 5.0 g N $m^{-2}$ rates. At 10 g N $m^{-2}$ *NE 91-118*, *378*, and *CODY* had good turfgrass quality. Management recommendations for 378 and *NE 91-118* are 2.5 or 5.1 cm mowing heights and a nitrogen rate of 10 g N $m^{-2}$ $year^{-1}$. Recommendations for *CODY* and *TEXOKA* are 5.1 or 7.6 cm mowing heights and a nitrogen rate of 10 g N $m^{-2}$ $year^{-1}$.

**Nitrogen Partitioning in Turfgrasses.** Field experiments to determine the fate of nitrogen fertilizer applied to three turfgrass species were initiated in 1997 at the John Seaton Anderson Turfgrass Research Facility near Mead, Nebraska. Fate of fertilizer nitrogen will be followed in buffalograss, Kentucky bluegrass, and tall fescue. Established turfgrass plots of two cultivars of buffalograss, *NE 91-118* and *NE 86-120*, a blend of Kentucky bluegrass, and a blend of tall fescue. The total amount of actual nitrogen that will be applied each year to a 9 $m^2$ plot is 0, 10, and 20 g N $m^{-2}$. For Kentucky bluegrass and tall fescue 80 percent of evapotranspiration will be returned every four days and for buffalograss 60 percent of evapotranspiration will be returned weekly. Plots will be randomly sampled prior to each fertilizer application to analyze for nitrogen content in plant and soil fractions. A Giddeon Soil Probe will be used to extract six cores (5 cm diameter) to a depth of 62 cm. Cores will be divided into thatch, verdure, roots, and soil components. The soil cores will be partitioned to four depths: 0 to 8, 8 to 16, 16 to 32, and 32 to 62 cm. After partitioning the cores by depth, the six samples will be composited, mixed thoroughly, and analyzed for total N, $NH_4^+$-N, $NO_3^-$-N, and N-isotope ratio.

**Buffalograss Resistance to Chinch Bugs.** The initial phase of this research involved developing screening methods and evaluating selected buffalograss germplasm for resistance to *Blissus occiduus*. Eleven buffalograss cultivars/selections (*CODY, BONNIE BRAE, TATANKA, TEXOKA, NE 91-118, NE 86-120, NE 86-61, 315, 378, 609*, and *NE 84-45-3*) were screened for resistance to *B. occiduus* in two greenhouse trials. Using chinch bug numbers and plant damage ratings to assess levels of resistance, the 11 buffalograss cultivars/selections were separated into categories of resistance. *CODY* and *TATANKA* consistently exhibited high levels of resistance to chinch bug feeding, while *BONNIE BRAE* and *NE 91-118* showed high to moderate levels of resistance. Other cultivars/selections, including *378, 315, NE 84-45-3*, and *NE 86-61*, were moderately to highly susceptible. *CODY* and *TATANKA* maintained acceptable turf quality although both became heavily infested with chinch bugs. This suggests tolerance may be a mechanism of the resistance. Studies designed to characterize the mechanisms of resistance are currently underway. Antixenosis experiments have revealed chinch bug preference for *TEXOKA, NE 86-120*, and *BONNIE BRAE*. Other cultivars/selections such as, *609* and *NE 91-118* are rarely preferred. ■