

# Characterization of Water Use Requirements and Gas Exchange of Buffalograss Turf

**Dr. Daniel Bowman**

**University of Nevada**

## **Goals:**

- To determine water use requirements of buffalograss.
- To examine genotypic variation in water use.
- To determine the effect of nitrogen fertilization on water use.
- To determine the relationship between photosynthesis and growth of buffalograss under drought stress.

Buffalograss may be the ideal species for both water savings and aesthetics, but water use data are scarce and one can only speculate on water requirements. This study is generating crop coefficients for buffalograss and identifies intraspecific water use differences among a diverse selection of genotypes.

A field project was installed at the University of Nevada - Reno Valley Road Field Station to determine water use requirements of seventeen buffalograss genotypes representing a diverse genetic background. This project utilizes a line source water gradient in which buffalograss varieties are planted in strips along the gradient. Turf performance can be measured at any given irrigation amount, and minimum irrigation requirements are indicated by that point in the gradient beyond which the turf goes dormant or cannot survive.

Mini-lysimeters (15 cm diameter, 30 cm depth) were planted, four per genotype, and established in the greenhouse. Cores for the lysimeters were drilled in each plot 2 meters from the main irrigation line. These will be used to determine evapotranspiration (ET) gravimetrically under non-limiting conditions. These lysimeters were used in a previous greenhouse experiment to determine intraspecific differences in water use rates. The results indicate that significant differences do exist in water use between buffalograss varieties, but the differences are relatively small. However, average water use rates are quite low (approximately half) in comparison to a similar experiment with tall fescue.

The line source gradient was established in July, 1994, with the irrigation scheduled based on ET (modified Penman) as determined with weather

station data. Data on ET under non-limiting conditions, turf quality, canopy temperature, soil moisture, minimum water requirements, and plant water status were collected during 1994.

The data demonstrate significant differences among genotypes for water use (crop coefficients ranged from 0.76 to 1.02) and turf quality. Canopy temperatures were relatively unaffected by drought until the end of the experiment, and then only increased at the very outer edge of the plots. Over the course of this experiment (31 days), the point demarcating the minimum irrigation required to prevent total dormancy corresponded to approximately 10 to 20% of ET. It is apparent from this preliminary data that buffalograss can produce an acceptable turf with deficit irrigation of 50 to 60% ET, at least for a relatively short period of time. The experimental period will be extended to at least 10 weeks in 1995 to stress the turf more severely.