

Establishing and Maintaining Turfgrass Over a Steam Line, 1996-97 Data

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This two-year study was started in the summer of 1996 to evaluate the performance of various grass species planted in an area with elevated soil temperatures above a steam line. The 16-inch diameter steam line has 3.5 inches of insulation and is buried 3.5 ft below the surface. The 400° F steam temperature has produced summer-time soil temperatures of 120° F at the 12-inch depth. The performance of both warm- and cool-season grasses will be monitored over a two-year period. Kentucky bluegrass, perennial ryegrass, tall fescue, and combinations of these species represent the cool-season species. Three warm-season species: zoysiagrass, bermudagrass, and buffalograss, were used alone and in combination with cool-season species. A total of 18 different grass combinations were planted in the summer of 1996 from sod or seed.

The experiment was situated in a 320 ft x 10 ft area above a buried steam tunnel on the intramural recreational facility on the Iowa State University campus. Individual plot size was 5 ft x 10 ft and three replications were included. This trial was designed as a randomized complete block.

Visual turf quality, turf color, and percentage turf cover data were taken October 10, 1996 (Table 1) and April 3, 1997 (Table 4). Visual quality was assessed using a 10 to 1 scale: 10 = best quality, 6 = lowest acceptable quality, and 1 = poorest quality. Brown or dormant turf was considered a negative aspect of overall turf quality, therefore winter dormant warm-season grasses received lower turf quality scores based primarily on poor turf color. Turf color was evaluated with a 9 to 1 scale: 9 = best color and 1 = poorest color. Percentage turf cover represents the percent of area per plot covered by turf.

Soil temperatures were taken in 1996 and 1997. On October 10, 1996 three readings were taken from each 5 ft x 10 ft plot (east, middle, and west) at three different depths: 1, 6, and 12 inches (Tables 3 and 4). This same methodology was followed for the temperature data taken March 8 for the 6- and 12-inch depths. The 5 ft by 10 ft plots were placed perpendicular to the length of the steam line so that the middle of each plot was directly over the steam line and received higher temperatures than either the east or west section of each plot. The 1-inch data, however, were replaced by 'middle' readings at the 2-inch depth. On April 3, only one temperature was taken from the 'middle' of each plot at 2, 6, and 12 inches deep (Tables 5 and 6).

Data were analyzed with the Statistical Analysis System version 6.10 (SAS Institute, 1989) using the Analysis of Variance (ANOVA) and General Linear Methods (GLM) procedures. Fisher's Least Significant Difference test (LSD) was used to compare means where appropriate.