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Time Domain Reflectometry (TDR) is an established method for volumetric soil moisture determination. The TDR setup consist of a set of stainless steel probes buried in the soil and crimped to cable wires that are connected to a high speed oscilloscope. The entire unit is hooked up to a computer. A signal from the oscilloscope travels through the cables and the probes and returns to the oscilloscope. A computer program automatically calculates the volumetric soil moisture content based on the the travel time and determines the irrigation needs per treatment.

Traditionally, the total moisture loss from the soil and plant surfaces (evapotranspiration, (ET)) is estimated from temperature, radiation, relative humidity, wind speed and plant water requirement, among others, over a period of time. Irrigation rates and frequencies are routinely derived from weather information and soil moisture content. Evapotranspiration in an urban environment is site specific and may vary considerably from regional climatic predictions.

The objectives of this study are to evaluate the effect of three irrigation treatments; maintaining at field capacity, 0.1 inch per day and water at stress only. The competition between bentgrass and annual bluegrass was evaluated on the basis of the percent encroachment of each species from pure stands.

Total water use was different by plant species and irrigation treatment. The field capacity treatment received 1.45 times more water than the 0.1 inch per day treatment and 3.65 times more water than the water at stress treatment. The 0.1 inch per day treatments received 2.52 times more water than the water at stress plots. Quality ratings showed that the field capacity treatment was superior to the 0.1 inch per day treatment which was superior to the stress treatment for both turf species although the bentgrass quality was better in most cases. With respect to species composition, bentgrass was generally more competitive than Poa.

A method of irrigation scheduling that is site specific, accurate, affordable, dependable and economical is most desirable in the turfgrass industry. Compared to conventional methods, the TDR method is faster, non-destructive, safer, accurate, based on known spatial volume, and can be easily automated to monitor soil moisture continuously. Time Domain Reflectometry will save time, energy, and would lead to a more efficient use of our water resources compared to traditional methods of irrigation scheduling. The efficient use of water for irrigation purposes can help maintain quality turf and reduce the potential for leaching of agricultural chemicals into groundwater.