INFLUENCE OF SOIL MOISTURE LEVEL ON TURFGRASS WATER USE AND GROWTH

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Reducing irrigation frequency is one means of conserving water. Of concern to the turfgrass manager would be the quantity of water conserved and any adverse effects on turf quality.

Three warm-season grasses (Tifway bermudagrass, Meyer zoysiagrass, common centipedegrass) were each irrigated under three irrigation regimes (well irrigated, moderate stress, severe stress). Results were: a) For the well watered irrigation regime, which would be common for golf course tees or very high quality fairways, bermudagrass used the least water in summer and fall. Relative to Tifway bermudagrass, Meyer zoysiagrass used 10%, 30%, and 5% more water for July, August, and October, respectively. Common centipedegrass used 4%, 23% and 13% more water than bermudagrass in July, August and October, respectively; b) At the moderate stress irrigation program, that would be typical of many fairways, water use rates were 39% and 11% greater in August for zoysiagrass and centipedegrass, respectively, than bermudagrass. Just prior to an irrigation, zoysiagrass showed slight wilt, while the other grasses did not; c) Under severe moisture stress, such as for rough areas, water use rates in August were 4% lower and 43% higher for zoysiagrass and centipedegrass, respectively, than bermudagrass. The zoysiagrass exhibited severe wilt and bermudagrass no symptoms. The semidormant state for zoysiagrass would account for its lower water use. Zoysiagrass did not appear to develop many roots into the heavy B horizon soil layer and could not effectively use subsoil moisture.

A second means of reducing water use is to use atmospheric, soil or plant based criteria to schedule irrigation in contrast to guessing when to water. We have gathered comparative data from this study on several irrigation scheduling techniques: measuring soil water content by time-domain reflectrometry; crop water stress index and stress degreee data which are plant based; and weather pan and Penman equation which are atmospheric based. Comparative data on these will allow growers to select the best means of scheduling irrigation.