The effect of irrigation and fertility on turfgrass performance

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Common irrigation recommendations for turfgrass are to irrigate deep and infrequently in order to achieve a deep root system that will be better suited to endure prolonged drought conditions. Deep infrequent irrigation is a vague description but generally refers to applying large amounts of irrigation, 0.5 to 1.0 inch or more, in a single irrigation. Irrigating deep and infrequently is not recommended for all turf situations. Turf grown on sandy soils should be irrigated with smaller amounts of water more frequently as deep infrequent irrigations could potentially result in losses of irrigation water through leaching. Also, turf grown on fine textured soils with low infiltration rates should be irrigated with smaller amounts of water more frequently to avoid run-off and puddling on the surface.

The alternative to deep infrequent irrigation is light frequent irrigation. Light frequent irrigation would be described as applying small amounts of water, 0.10 to 0.25 inch, every day or every other day. Common perceptions of light frequent irrigations are that they promote shallow rooting in turfgrass thereby making the turf more susceptible to dry soil conditions. Furthermore, frequent irrigation applications are often implicated in increased weed interference. Despite all the negative effects put forth for light frequent irrigation applications the MSU Turf Team has consistently touted a light frequent irrigation as a superior irrigation scheme for cool-season lawns. Some of the documented positive effects of light daily irrigation include the following. Light frequent irrigation treatments, 1/10 inch every day at 12 p.m., reduced the symptoms associated with Necrotic Ring Spot (Melvin and Vargas). Research by Smitley and Bughrara found that European chafer survival was reduced by daily irrigation. There was also research done by a group of MSU researchers that showed a daily irrigation of 0.1 inch every day at 1 p.m. resulted in the highest turfgrass quality when compared to natural precipitation and a single application of 0.7 in. of water once a week.

The current research is investigating the effects of irrigation and fertility treatments on three turfgrass species/mixes. The turfgrass species/mixes are Kentucky bluegrass, tall fescue, and a common 3-way lawn mixture of Kentucky bluegrass, perennial ryegrass, and creeping red fescue. Turfgrass plots were established from seed in autumn 2003 and maintained to provide full turfgrass coverage in 2004. The irrigation treatments were adjusted from previous studies to reflect common irrigation restrictions that are often imposed by local municipalities during droughty periods. The irrigation treatments are 0.2 inch every other day, 0.7 inch once per week, and natural precipitation. All irrigation treatments are applied at 6 a.m. The nitrogen treatments are 2, 3.2, and 4.2 lbs. N/1000 $ft.^2$/yr applied over two, four, and six applications, respectively. Nitrogen is applied using a 75% fast release (urea) and 25% slow release (sulfur coated urea) mixture. Treatments were initiated on April 23, 2005. Turfgrass quality, color, and soil moisture measurements are taken every two weeks throughout the trial. Root samples will be taken in the autumn.