**Stop 1**

## The Effects of Irrigation Frequency on Three Turfgrass Species

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What is the best irrigation strategy for home lawns? The vast majority of university turfgrass specialists recommend deep infrequent irrigation. Deep infrequent irrigation (also known as heavy infrequent or weekly irrigation) is believed to stimulate root growth by forcing the roots to grow to the depth of the water. Therefore, if deep root growth is enhanced by infrequent irrigation then the plant could potentially have improved drought tolerance if water becomes limiting. Up until the mid 1980's Michigan State University advocated the deep infrequent irrigation recommendation for home lawns

Toward the end of the 1980's Dr. Joe Vargas Jr. and his MSU turfgrass staff found that light frequent irrigation reduced the symptoms of necrotic ring spot (NRS). Cultural control of NRS was achieved with a combination of light daily irrigations around 2:00 p.m. and application of slow release nitrogen fertilizer. Since NRS is the most destructive home lawn turfgrass disease, MSU began advocating light frequent irrigation (also called daily irrigation) for the homeowner. Despite the research results from MSU, to this day the common recommendation for home lawn irrigation is deep infrequent.

Research was initiated in the fall of 1997 to analyze the effects of irrigation frequency, turfgrass species, and nitrogen rate on turfgrass quality. The three irrigation regimes are non-irrigated, watered once a week in the early a.m. with 0.7 inch, and watered daily at 2 p.m. with 0.1 inch. The turfgrass species are perennial ryegrass and turf-type tall fescue, established from seed, and Kentucky bluegrass that was sodded on the site.

Broadleaf weed counts were taken in September of 1999 and August of 2000 (Table 1). In 1999 there were more broadleaf weeds on the daily and weekly-irrigated plots than on the non-irrigated plots. The trend was reversed by August of 2000 as the daily-irrigated plots had fewer weeds than the weekly and non-irrigated plots. These results can be explained by the fact that 1999 was an extremely dry year and the non-irrigated plots were often dormant. The lack of soil moisture in the non-irrigated plots resulted in little broadleaf weed competition. Given adequate moisture (such as was the case in the summer of 2000) the daily irrigated plots had over 50% fewer broadleaf weeds compared to the non-irrigated plots and the weekly irrigated plots. The broadleaf data from the two seasons implies that light frequent irrigation creates a denser turfgrass canopy as compared to the weekly irrigation schedule.

Grassy weed competition (mostly from *Poa annua*, some bentgrass, and crabgrass) was more severe in perennial ryegrass than tall fescue and Kentucky bluegrass (Table 2). Also, the greater the irrigation frequency the greater the grassy weed infestation in the ryegrass plots. Given that over 80% of the grassy weeds were *Poa annua* the data is

easily explained. *Poa annua* thrives when temperatures are cool and moisture is plentiful. Perennial ryegrass is a fine bladed bunch type grass that is very susceptible to red thread and rust under cool moist environmental conditions. The environmental conditions in Mid-Michigan in 2000 were conducive for the thinning out of the ryegrass and thus the infestation and germination of the *Poa annua*.

Other points of interest include the fact that during the summer of 1999 surface temperatures were often 20° F lower on the daily irrigated plots than the weekly irrigated plots. On the weekly irrigated plots the tall fescue displayed greater drought resistance compared to the other turfgrass species under similar irrigation.

Table 1. Broadleaf weed counts in 1999 and 2000.

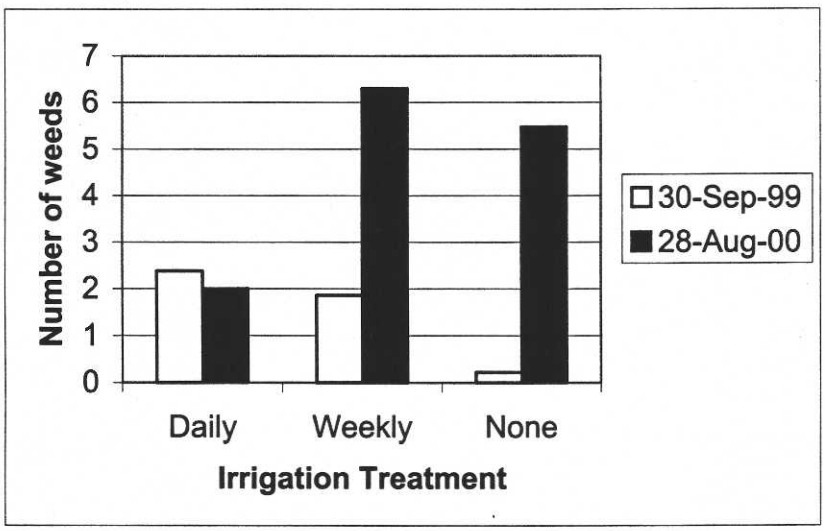


Table 2. Percent grassy weeds on 4 August 2000 in Kentucky bluegrass, perennial ryegrass, and tall fescue.