# GROWING KNOWLEDGE

Series content is coordinated by Dr. Jay Pscheidt, professor of botany and plant pathology at Oregon State University in Corvallis, Oregon.

An ongoing series provided by Oregon State University in collaboration with the United States Department of Agriculture and in partnership with the Oregon Association of Nurseries

# Optimum watering schedules for Oregon home lawns

BY CONNER OLSEN AND ALEC KOWALEWSKI

IN TIMES OF DROUGHT, outdoor water-use restrictions are most often focused on landscape water use, and implemented in terms of the number of days per week for which watering is allowed. This method, although effective at reducing water use, neglects to consider ideal irrigation frequency for maintaining the health of specific plant species.

Landscapes heavy in low-growing, shallow-rooting groundcovers, such as turfgrass, require more frequent irrigation than landscapes full of woody, deep-rooting plants. For this reason, plant-specific irrigation requirements should be considered when establishing guidelines for water-use restrictions.

While modern irrigation systems can be incredibly efficient, many homeowners and property managers with advanced systems are guilty of over-irrigating, largely due to the inefficient use of timers. Timers are often unaltered following the installation of optimal-efficiency sprinklers, resulting in little, if any, water savings. Schedules that are based on summer irrigation requirements will inherently overwater in the spring and fall.

Claims have been made that deep-and-infrequent irrigation practices will deepen the root zone of turfgrass plants and improve drought tolerance. However, the densest stands of grass are most often found on golf courses where irrigation is applied daily. Region-specific field studies should be conducted to identify proper irrigation techniques to promote acceptable turfgrass quality during periods of drought, while using as little water as possible.

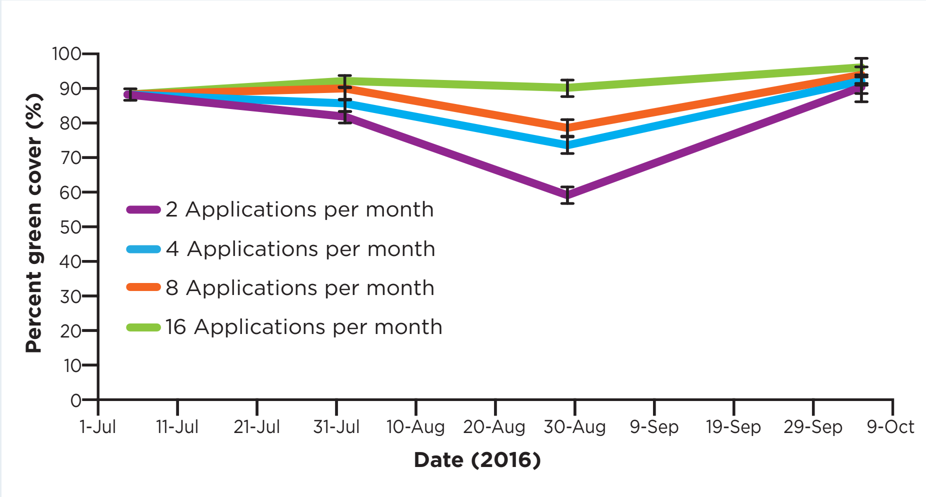


Figure 1: Effect of irrigation frequency on percent green cover over the 2016 summer season in Corvallis, Oregon. Turfgrass consisted of a perennial ryegrass blend maintained at 5.1 cm. Values are means (n = 20) and 95 percent confidence intervals estimated using Fisher's projected least significant difference test.

The goal of this study was to identify the optimal irrigation rate and frequency for perennial ryegrass management in the Willamette Valley. The intent/purpose was to determine minimal watering rates that still provide acceptable turfgrass quality throughout the dry summer months experienced in the cool-humid Willamette Valley.

## Materials and methods

This study applied irrigation — ranging from 5.1 to 10.1 cm per month; or 0.5 to 1.0 inch per week) — at five frequencies (2, 4, 8, and 16 applications per month) to lawn-height (5.1 cm) perennial ryegrass (*Lolium perenne*) in the Willamette Valley of Oregon, in an effort to determine minimal watering rates that will still provide acceptable turfgrass quality throughout the summer months.

A two-year field trial was initiated in July 2016 and concluded in September 2017 on native soil at the Oak Creek Center for Urban Horticulture, Corvallis, Oregon. Experimental design was a 2 by 4 by 5 factorial in a randomized complete block design with four replications. Factors included year, irrigation intensity, and irrigation frequency.

Irrigation was applied as the schedule prescribed from July through September of 2016, and again from July to September of 2017.

**Findings**

The highest irrigation frequency (16 applications mo$^{-1}$) consistently produced the greatest turf color, density, percent green cover, and soil moisture throughout the study period in both years (Figure 1).

The lack of root-zone storage amongst perennial ryegrass cultivars (i.e., no rhizomes and a relatively shallow rooting depth), combined with the severity of summer drought conditions in the region (sometimes four consecutive months), as well as the relatively low mowing height used in this study (which produced a shallow root zone and decreased overall plant mass), were all contributing factors to the results of this study.

Over two years, it was shown that acceptable-quality turfgrass was provided through applying 8.9 cm mo$^{-1}$ (Figure 2). This was achieved through light-and-frequent irrigation applications (at least twice per week, with four being better than two).

As these findings suggest, recommendations for the Willamette Valley should incorporate higher frequency of applications, along with the caveat that the “inch per week” recommendation is sufficient for peak water demand, but, in the name of water conservation, schedules could — and should — be reduced in the early and late summer when evapotranspiration (ET) rates are less.

While this study was designed to determine optimal irrigation rate and frequency, major concerns still exist regarding irrigation distribution non-uniformity and improper use of timers — with irrigators too-often resorting to bumping up their application rates to account for poor uniformity or increased expectations. Improving irrigation distribution uniformity, along with optimizing irrigation rates and frequencies by species and region, could have a tremendous impact on water-use worldwide.

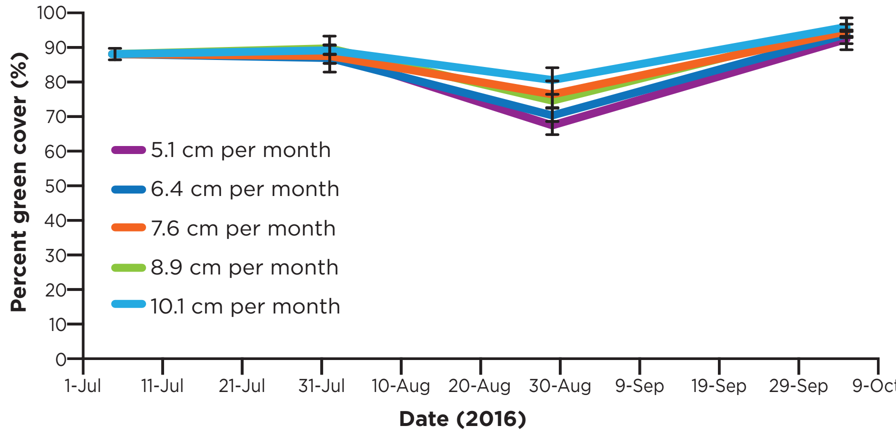


Figure 2: Effect of irrigation intensity on percent green cover over the 2016 summer season in Corvallis, Oregon. Turfgrass consisted of a perennial ryegrass blend maintained at 5.1 cm. Values are means (n = 16) and 95 percent confidence intervals estimated using Fisher’s projected least significant difference test.

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Image 1: ¼” applied 4 x per week from July 4 to September 1, 2016,

Image 2: 1” applied once a week from July 4 to September 1, 2016.


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