Irrigation Frequency and Water Conservation

Benefits of Watering Less Often

1. Turfgrass is much healthier when allowed to become mildly stressed between irrigations. Most problems in lawns are caused by overwatering, not under watering. Allowing the soil to dry down in a heavy soil promotes air movement into the soil pore spaces, which is very important for roots. Roots need oxygen and cannot function optimally or grow when the soil is too wet.

2. Watering less frequently will help develop a deeper root system. Optimally, the turfgrass will root comprehensively deep, provided the soil conditions are right. Watering too frequently and shallowly keeps roots in the uppermost layers of the soil. That said, each species has genetic limitations. It should not be expected that Kentucky bluegrass will develop a comprehensive root system as deep as that of tall fescue, for instance.

3. The lawn can benefit from rainfall between less-frequent irrigations if irrigation systems are equipped with rain shutoffs or you manually shut off the irrigation controller until the grass indicates a need for water. Water conservation results when the turf is healthier and more able to go for longer intervals without irrigation, thus better able to take advantage of interim rainfall. The turf will be better acclimated to drought conditions if it is allowed to become mildly stressed between irrigations.

4. Watering less often will help conserve our limited water supplies and potentially reduce your water bill. Outdoor irrigation accounts for 40-60 percent of residential water use. Of that number, as much as 50 percent of water applied is wasted because of poor irrigation practices.

"I water my lawn every day. Is that too often?"

This is a question frequently asked during Northern Water landscaping and watering presentations. The answer to anyone living in the Northern Colorado Front Range cities closest to the foothills will likely be a vigorous "Yes!"

Believe it or not, lawns can thrive for many days without requiring irrigation or rainfall, when on the heavy clay soils of the Northern Colorado Front Range,

Perhaps you are still thinking: “But my grass needs to be watered every day.” Sometimes this is true, for a variety of reasons. On a sandy soil or a shallow soil over impermeable layers, perhaps the grass really does require water that often. However, properly prepared clay soils can be different as seen in Figure 1, which shows a soil moisture chart of a Kentucky bluegrass plot on an amended clay soil in Northern Water’s Conservation Gardens.

Eight or Nine Days Between Irrigations

This particular plot of Kentucky bluegrass was irrigated only every eight or nine days, as shown by the irrigation dates at the bottom of Figure 1. A soil moisture sensor was embedded in the turf for irrigation control. The lower limit was set to 50 percent of “management allowable depletion,” which means that when the soil moisture was halfway between field capacity and wilting point the plot was irrigated. (See the Plant Available Water sidebar.)

So how did we stretch our watering out to eight or nine days between irrigations? The answer is: soil preparation and our choice of a drought-hardy Kentucky bluegrass blend.

Soil Preparation Is Critical

What is soil preparation and why is it critical to landscapes that can tolerate longer intervals between irrigations or rainfall?

Soil preparation in the urban landscape includes tillage and also adding amendments to the soil. Most Front Range cities require tillage and soil amendment with high-quality organic matter/compost for new construction of landscapes. Tillage breaks up and mixes the soil, eliminates or reduces compaction, and improves the soil volume for better root growth.
Plant available water in the soil is affected by both soil texture (sand, silt and clay) and by soil structure (single grain, blocky, granular, platy, prismatic, columnar, crumbs and massive). Significantly changing the soil texture is impractical in most cases. However, soil structure can improve following deep tillage and the addition of organic amendments. These efforts help move heavy clay soils with massive structure (highly unfavorable for plant growth) toward crumb structure and eventual aggregation into granular structure. Granular soil structure is well aerated, holds more plant available water, and is highly favored for successful, long-term plant growth.

Although adding organic matter is commonly perceived to add nutrients (which it does to some extent), it is not the primary reason for amending our clay soils with organic matter. In clay soils, organic matter helps create larger pores to improve infiltration, drainage, and aeration in the root zone. In sandy soils, organic matter improves water retention by creating a variety of smaller soil pores.

With proper tillage and soil amendment, plants have a larger rooting volume to grow in and therefore a larger soil water volume to draw from.

**Drought-Hardy Bluegrass Blend**
The soil in Northern Water’s Kentucky bluegrass plot was prepared through tillage and the addition of organic amendment before reseeding with a drought-hardy Kentucky bluegrass blend from Pawnee Butte Seeds (http://www.pawneebutteseeds.com/seed-list/mixes/) in 2012. Drought-hardy bluegrasses may have deeper root systems or can make adjustments at the cellular level to maintain water in plant tissues during drought conditions.

**Existing Lawn Management**
Can your existing lawn be improved and managed to water it less often? Yes it can, with proper soil preparation and core aeration. Even without a complete replacement of the existing turf, you can very likely water your lawn at least somewhat less often than you may be doing now. If your soil was never properly prepared, improving it may be a long-term effort. In this case, core aeration is recommended and can be done fairly heavily without harm to the turf, following best practices. Top dressing your lawn with compost following core aeration may also be beneficial. See this Colorado State University Extension Lawn Care guide (http://www.ext.colostate.edu/pubs/Garden/07202.html).

Renovating an existing soil and turf is an exercise of persistence and patience.

Start the process with good core aeration following best practices. Proceed carefully to allow more soil drying time between irrigations, letting the turf be your guide. If it turns a blue or gray hue, or retains footprints in a slightly crunchy lawn, the turf has become mildly to moderately stressed. Applying more water to a deeper depth but less frequently helps the turf extend its roots deeper into the soil. To some extent, the wetted zone of a soil can also be a factor in defining the root zone, if soil preparation has been adequate and other best turf management practices have been followed.

Watering your Kentucky bluegrass every day is not necessary for most Northern Colorado Front Range lawns. Watering the lawn less often can help conserve water and produce a healthier lawn and root system that is better adapted to a wide range of climate and water availability conditions.

![Soil Moisture Kentucky Bluegrass](image)

**Figure 1.** Turf in this Northern Water Kentucky bluegrass plot was irrigated only every eight or nine days from June through August 2013. The blue diamonds indicate when the plot was irrigated. The raindrop symbol indicates when the plot received significant rainfall (0.63”). While the plot received additional rainfall, volumetric soil moisture measurably increased.