Myth or Fact: 
Tall Fescue Requires Less Water Than Kentucky Bluegrass

Does tall fescue require less water than Kentucky bluegrass as many people believe? It’s a myth that tall fescue requires less water than Kentucky bluegrass.

Then why the confusion?

At Northern Water, tall fescue and Kentucky bluegrass behaviors were demonstrated at a range of irrigation levels. Using a line source irrigation system, a continuous gradient of irrigation was applied so that one side of the turf plot was well-watered and the other side was nearly non-irrigated. Tall fescue and Kentucky bluegrass were compared to a warm season mix of buffalograss and blue grama also irrigated with the line source system.

The following photos show that tall fescue and Kentucky bluegrass have similar quality all along the irrigation gradient. The chart on the following page shows how similarly the greenness declines between Kentucky bluegrass and tall fescue.

The three photos were taken Sept. 5, 2012, the same day as aerial imagery was obtained. The fractional numbers at the side of the photos indicate irrigation + precipitation relative to the reference evapotranspiration (ETo, grass reference ET). The numbers and lines on the photos correspond to the x axis of the chart. Between 5/22/2012 and 9/4/2012, ETo was 24.4 inches. Full season ETo (from first irrigation to last irrigation) was 31.0 inches (5/22-10/23/2012).
Myth or Fact: Tall Fescue Requires Less Water Than Kentucky Bluegrass

www.northernwater.org

Fact sheet authored by Dr. Mary J. Hattendorf, Ph.D

September 5, 2012

Figure 1. Turf greenness compared to the ratio of precipitation + irrigation to grass reference evapotranspiration (ETo). Percent greenness is a value derived for each individual turf plot. Greenness values at intervals on the irrigation + precipitation gradient were calculated as a ratio of greenness to maximum greenness in that plot and converted to percent.

Some research results state that tall fescue can require 10 percent less water than Kentucky bluegrass if soil volume is deep, with no compaction, and with good water management. This relatively small reduction in water requirement is very hard to achieve, so in reality there is little difference.

Other sources have claimed that tall fescue requires half the water, or even 1/3 to 1/4 the water that Kentucky bluegrass does. Which is correct? Various research results do not support these claims. If tall fescue needs considerably less irrigation, it most likely has received moisture from another source, such as soil moisture deep in the soil profile or runoff from another area. Both conditions mask its true water requirements—until the deep soil moisture runs out or the runoff source is controlled. Requiring less irrigation is not the same as a lower plant water requirement.

It is important to distinguish between an irrigation requirement and the plant water requirement. The plant water requirement is the total amount of water from any source that plants need for desired growth or condition. The irrigation requirement is the amount of water needed to supplement precipitation or other non-irrigation sources for the same desired plant growth or condition.

The truth is that tall fescue is not a miracle grass. It has strengths and weaknesses, and with its deep rooting system, is a good turfgrass for deep soils. Tall fescue handles drought conditions by having a large soil volume to extract soil moisture from. Because it has no ability to go dormant, tall fescue has limited ability to recover from prolonged soil water deficit without stand loss. Because of its bunch grass growth habit, tall fescue will not fill in the gaps in the stand as Kentucky bluegrass will.

What is ETo?
ETo is reference evapotranspiration. It is a value calculated from weather data, but is traceable to the measured and documented evapotranspiration of a reference surface of grass. The reference grass is a cool season grass kept clipped at 4.7 inches height with soil moisture not limiting. Northern Water calculates ET using the ASCE standardized reference evapotranspiration equation.

Compared to the cool season species, the warm season turf retained greenness much further along the irrigation gradient. Because blue grama and buffalograss are native to the Colorado plains, they are well-adapted to a wide range of conditions. If tall fescue required considerably less water than Kentucky bluegrass, visually acceptable tall fescue would be found much further out on the line source gradient, similar to the warm season grasses. While this is a semi-quantitative point of view, the visual is compelling. Although the percent greenness clearly declines in the graph, the photo visuals indicate that acceptable quality drops off closer to the 0.73 (P+I)/ETo level. This agrees substantially with other results which indicate that, as a generality, cool season turf can be irrigated at rates approaching 70 percent of ETo and still maintain acceptable quality. The graph plus photo visuals also indicate that visual quality is not appreciably enhanced by addition of precipitation and irrigation above the 1:1 ratio of (P+I)/ETo.

A brief summary of percent greenness and its data origins can be found here: www.northernwater.org/DroughtTolerantBluegrass.

For more information on the Conservation Gardens, studies and activities "Like" our new Facebook page, facebook.com/ConservationGardens.