



## LANDSCAPING GUIDE

### DROUGHT TOLERANT KENTUCKY BLUEGRASS IN NORTHEASTERN COLORADO

Summer 2014

#### BEST PERFORMING BLUEGRASS SEED VARIETIES

- America
- Blue Chip
- Mongoose
- Moonbeam
- Princeton 105
- Rampart\*
- Showcase\*

\* no longer commercially available

#### FEATURES & BENEFITS

- Pleasing color and texture
- Resilient to periodic drought
- Grows back into damaged areas
- Goes dormant in winter and during drought

#### SOIL PREPARATION

- A well-drained soil promotes plant growth and saves water
- Clay soils tend to hold moisture tightly and sandy soils tend to hold much less moisture and drain quickly
- Add organic matter such as compost to improve moisture retention in sands and to improve drainage and aeration in clays
- Visit the Water Conservation page at [northernwater.org](http://northernwater.org) to learn more about soil preparation

#### SEEDING RATE

- New turf: 2-3 lbs/1,000 sq ft. or 90-125 lb/acre
- Overseeding Rate: 1-2 lbs/1,000 sq ft or 40-90 lbs/acre

Kentucky bluegrass is popularly considered a high maintenance, high water requirement grass. It has perhaps unfairly acquired a reputation of being a grass to avoid with respect to outdoor residential water conservation.

Is Kentucky bluegrass a villain in the urban landscape? The short answer is no.



This guide, for landscapers and homeowners, highlights some preferred Kentucky bluegrass seed varieties for the Northeastern Colorado landscape. Through Northern Water studies, we have identified seven Kentucky bluegrass varieties that adapted well to drought cycles in the region's semi-arid climate.

#### Study of 40 Kentucky Bluegrass Varieties

Northern Water is studying the drought tolerance and other water-use characteristics of 40 Kentucky bluegrass varieties at its Conservation Gardens in Berthoud, CO. These studies began in 2005 and do not include more recently introduced varieties.

Kentucky bluegrass is a widely grown cool-season grass because of its pleasing color and texture. Its growth habits make it a resilient component of urban landscapes that experience periodic drought, whether because of the lack of natural rainfall or because of municipal watering restrictions.

Kentucky bluegrass is a sod-forming grass that spreads by rhizomes, which are underground stems. This growth habit gives Kentucky bluegrass the ability to grow back into areas that have been damaged or destroyed, a valuable characteristic. Another important trait is the ability to go dormant when the soil becomes too dry. These two traits give Kentucky bluegrass an edge over other cool-season turf species in the urban landscape for longer-term drought conditions.

#### Kentucky Bluegrass Compared to Tall Fescue

Compared to tall fescue, for instance, Kentucky bluegrass has a shallower root system. Tall fescue can avoid drought by mining soil moisture with its typically 2 foot deep root system. However, once soil moisture is exhausted, stands of tall fescue will start to thin. Tall fescue has no dormancy mechanism, which makes it more suitable for short-term

drought, but vulnerable in long-term drought. Thus bluegrass can survive longer periods of dormancy than tall fescue.

### Green Lawn Starts with Proper Soil Preparation

Keep in mind that a blend of Kentucky bluegrass varieties is better than a single variety in the landscape. A well-designed blend can offer the benefits of drought tolerance, disease resistance, and traffic tolerance without the susceptibilities that can accompany a single-variety lawn. Regardless of the drought tolerance of a variety, proper soil preparation is the key to a thriving and successful turfgrass stand, whether the turf is seeded or laid as sod. Even turfgrass rated as highly drought tolerant may fail spectacularly during drought if soil preparation was inadequate.

### Kentucky Bluegrass has the Ability to go Dormant

The ability of Kentucky bluegrass to go dormant is beneficial in many ways. A dormant turf has stopped growing; typically the leaf blades eventually turn brown but the crowns, rhizomes and roots remain alive. In cold climates such as Colorado's, Kentucky bluegrass becomes dormant during the winter as well as during periods of reduced rainfall or irrigation in the growing season. A dormant turf requires only enough moisture to maintain crowns, rhizomes and roots.

From one point of view, the sooner dormancy occurs; the more water will be conserved. However, about 1 inch of irrigation or rainfall per month is required to maintain crown, rhizome and root viability in our Colorado climate. There is also a threshold level of irrigation (or rainfall) required for bringing turf out of dormancy with more moisture required to continue the regrowth processes. During the dormancy period, the benefits of green turf are lost. Dormant turf is vulnerable to traffic, disease, insects and weeds.

Another point of view is to grow or develop varieties that stay green longer. This would help homeowners retain the benefits of a green lawn for as long as possible. This approach requires identification of varieties that take better advantage of soil moisture or have physiological mechanisms that allow them to remain green or avoid wilt for sustained periods during drought.

The industry is headed toward this goal: Kentucky bluegrass that maintains green color for the longest period under drought conditions. The negative aspect of this approach is that it could take more water to return the grass to its pre-drought condition once watering restrictions are lifted, or natural rainfall occurs, because the soil profile has become more depleted and more water will be needed to replenish the root zone.

### Northern Water's Bluegrass Plots

With these concepts in mind, Northern Water established a paired plot study of 40 Kentucky bluegrass varieties in 2005. Each half of the plot was planted to the 40 varieties and irrigated separately. After establishment, irrigation on the north half of the plot was halted for 4-6 weeks during the summer, usually mid-July through the end of August. In 2011, 2012, and 2013, 4-band aerial imagery was collected to determine which varieties



had the most greenness or the highest green vegetation index. Details of the imagery acquisition and processing can be found on Northern Water's website: [northernwater.org](http://northernwater.org). Click the Water Conservation tab at the top of the home page, then click these links: **Landscape Industry > Resources & Training > Mapping Turf Evapotranspiration with High-Resolution Multispectral Aerial Imagery**. The two images used each season in the analysis showed the turf greenness levels just before irrigation was withheld (pre-drought) and just before irrigation was resumed (end of short term drought). The vegetation index was normalized to the maximum vegetation index determined for each variety and reported as percent green.

### Best Performing Varieties According to the Study

The seven best performing varieties from this paired study still readily available on the market were:

- America
- Blue Chip
- Mongoose
- Moonbeam
- Princeton 105
- Rampart
- Showcase

### Where to Buy

Of these seven bluegrass varieties, America and Moonbeam are available locally in Greeley at Pawnee Butte Seed, Inc. Consumers may also purchase Princeton 105 online through Seed Super Store.

Other local seed sources include Arkansas Valley Seed and Sharp Brothers Seed. Other online sources for seed are National Seed and Pro Seed Marketing. Varieties not currently sold by local companies such as Rampart and Showcase can best be found by asking a local supplier to acquire the seed or by contacting Seed Research of Oregon (<http://www.sroseed.com>) directly for names of local distributors.

*Additional information is available from Colorado State University at: [csuturf.colostate.edu](http://csuturf.colostate.edu).*