



Turning Drought into Numbers

by Doug Brede, Ph.D.

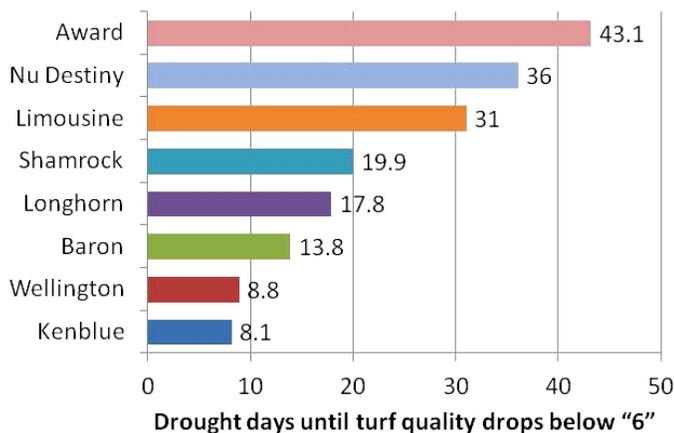


Automated rainout shelter at Kansas State University. Rain sensors on the structure cause it to roll into place over the turf when rain threatens.

Few people would argue that 2012 has been an exceptionally dry year for much of the US. Damage to agricultural crops has been severe and commodity prices are soaring. Many Midwestern lawns have been reduced to stubble and dust.

But getting people to agree on a common yardstick to measure the effects of turfgrass drought is another story entirely. Although people generally say, "they know drought when they see it," turfgrass scientists have been tasked with coming up with inventive ways of putting numbers to drought. Several current techniques are explained on page 2.

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Two-year results from the KSU rainout study showing the number of days a bluegrass could maintain a turf quality rating above "6" while being subjected to drought. The researchers considered "6" to be acceptable turf quality, but anything less to be unacceptable. Larger numbers indicate better drought tolerance. Longhorn represents an example of a Texas bluegrass hybrid. Data ranged from 8 days for Kenblue to 45 days for Blue Velvet.

Introducing a top new variety: 'Summer' Tall Fescue

by Susan Samudio, MSc.



The one turf plot that caught more attention at our Post Falls research farm this year was a plot of **Summer** tall fescue. Most folks didn't even know it was tall fescue – it was so fine bladed, they thought it was Kentucky bluegrass.

Leaf width of tall fescue is getting more and more like Kentucky bluegrass, claims turf breeder, Susan Samudio. Pixie was released in 1992, Quest in 2002, and Summer tall fescue in 2012.

Summer is the first release from our new generation of tall fescues with finer leaf texture than ever before. **Summer's** leaf texture is finer than Justice, Falcon IV & V, **Jaguar 4G**, **Inferno**, Virtue, Avenger, **Arid 3**, **Pixie**, and **Quest**, as shown in the leaf photograph and bar chart. **Summer's** dark green color combined with its high density helps maintain its excellent turf quality especially during the summer heat.

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Sports Turf Managers Association 2012 Football Field of the year: Northwestern University

Ryan field was seeded to Jacklin Kentucky bluegrasses Everest, Award, and NuChicago. Later, Rush Kentucky bluegrass and CSI perennial ryegrass were added to the mix.



F.O.Y.
Ryan Field, Northwestern University

- Level of Submission: College
- Category of Submission: Football
- Field: Sandy (Stonewall)
- Lead Sports Turf Manager: [Name]
- Site Supervisor of Grounds: [Name]
- Year: [Year]
- Work History: [Text]
- Original Installation: 1926
- Turfgrass variety: Freedom III

entry level worker. I have worked my way up the ladder to Supervisor of Grounds through hard work and long hours. Networking and the STMA has helped me through just about anything and everything.

After every cutting or mowing, we covered with 200 lbs of Low-Mow Blue. Seeding 4 weeks before our first football game of the year, we covered evenly with 10 lbs of Low-Mow Blue, so the seed is germinating throughout the playing season. We just extra seed behind each goal post and sidelines on an as-needed basis.

Drainage system: The field has a herringbone pattern gravity drainage system on 15-foot centers.

Drought, continued

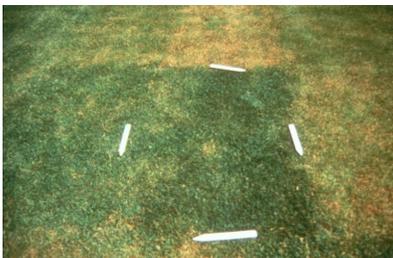
A new study at Kansas State University by Jason Lewis, Dale Bremer, Stephen Keeley, and Jack Fry sheds light on turfgrass drought by use of a simple yet pioneering technique: They examined how long it takes drought-stricken turf to decline below a quality estimate of "6." The study was published in the July/August issue of the peer-reviewed journal, *Crop Science*.

In each of their two years of study, the plots were well watered at the start of the study in mid-June. Then the water was turned off. Turf quality was recorded daily by the same person throughout the summer. When drought on any plot was detected, that individual plot was carefully hand watered with 1 inch of water from a metered hose. "When 50% or more of a plot displayed drought stress, it was irrigated," wrote Lewis.

Of course, the magical ingredient that made this study work was to be able to turn off the rainfall to prevent it from interfering with the data. To do this, the researchers constructed a mobile greenhouse on wheels (see photo page 1). The greenhouse was fitted with sensors to detect the first incidence of rain. When detected, motors on rails closed the roof until the rain stopped, thus providing a perfectly rain-free Kansas summer.

With all 30 bluegrasses tested, and in both summers, visual quality decreased below 6 at some point. The average bluegrass persisted 25 days in 2007 and 33 days in 2009 before its quality decayed. The researchers speculated that they might be able to push this interval even longer if they irrigated when the plots showed less wilt. "Perhaps visual quality could have been maintained at acceptable levels by applying water when only 25% of the plot exhibited symptoms of drought stress," they wrote.

Improved varieties like **Award** and **Nu Destiny** were able to persist with acceptable turf quality for more than a month without precipitation. Common types, like



Real-world results echo experimentation: This turf plot of Award Kentucky bluegrass growing in Italy shows exceptional drought tolerance through a particularly menacing summer.

Park, Baron, and Kenblue dropped to unacceptable quality levels in the first week or two without water. Two Texas hybrid bluegrasses in the study exhibited an unexpected outcome. Texas bluegrass is hailed by its supporters as being heat and drought tolerant. However, both hybrids, Longhorn and Thermal Blue Blaze, scored in the bottom third of the results, browning out after less than 26 days.

continued NTEP assesses drought tolerance using four different visual measures: wilting, leaf firing, dormancy or recovery. A rating of 1 would be complete wilting, 100% leaf firing, complete dormancy or no plant recovery; and 9 would be no wilting, no leaf firing, 100% green (no dormancy), or 100% recovery. 🏠

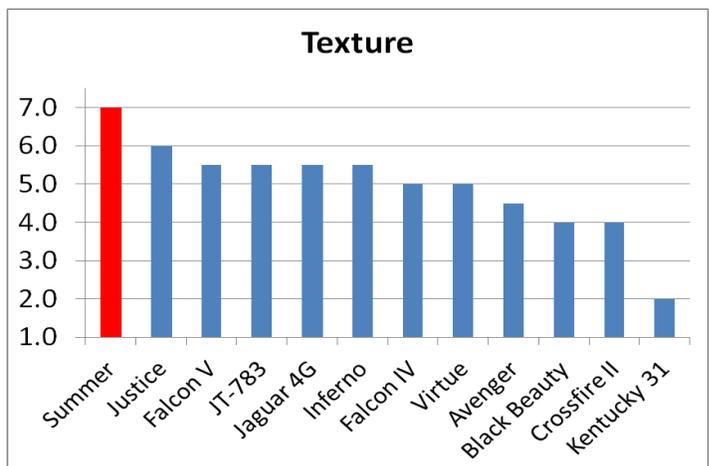
Summer, continued

I developed **Summer** tall fescue from plants in our nursery that impressed me as being particularly fine bladed. These plants were then grouped together to further concentrate the trait. Turf plots were then planted in Maryland, Ohio, and Idaho to substantiate the trait. In the Breeder block, in addition to fine leaf texture, the plants also exhibited greater density and



good seed set. **Summer's** first Certified seed crop was harvested in 2012, and it will be in full production in 2013.

Summer has had superior turf performance in company trials and was entered in the 2012 tall fescue NTEP trial. **Summer** has moderately good brown patch tolerance for use in blends in the Southeast. In company trials, **Summer** had reduced top growth, producing 20% fewer grass clippings than **Pixie**. This translates into a substantial reduction in mowing costs. 🏠



Summer tall fescue planted in a 2010 fescue turf trial near New Carlisle, OH. Ratings were on a 1-9 scale, where 9 = finest.