



NEWSFLASH

Early Spring Greenup: The Next Frontier in Elite Kentucky Blue-grasses

by Doug Brede

It's finally springtime! Time to grab the golf clubs and fire up the mower. Wouldn't it be great if your grass was as eager to jump into spring as you were?

Well wish no more.

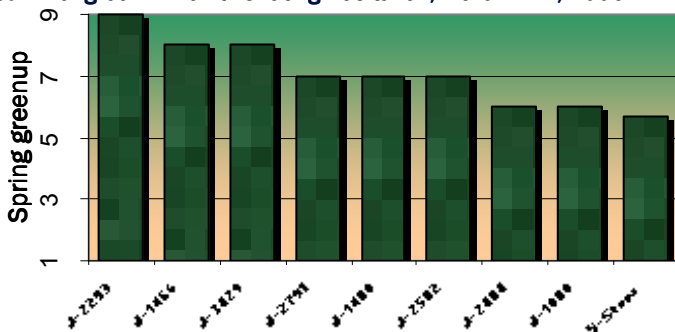
I've been breeding Kentucky bluegrasses at Jacklin Seed for 20 years now. By some accounts, I've been quite successful, having developed 17 of the top 20 bluegrasses in NTEP. But one of my elusive goals has been to substantially improve the early spring



Experimental bluegrass, 04-1657 (arrowed plot), never goes winter dormant. All other varieties in this Idaho trial, photographed March 1st, were rating 1's and 2's while this experimental scored a 9. Though 04-1657 is still years from commercialization, it illustrates the spring performance possible in an elite Kentucky bluegrass (see Fig. 1).

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Fig. 1. Early spring greenup differences among our new Kentucky bluegrass varieties at a trial at Delta Bluegrass sod farm, near Lodi, CA. Some plots were still winter brown (not shown). A typical 5-steps-above® Kentucky bluegrass variety rated 5 to 6 (right bar). Several of our newest generation of bluegrasses appeared "mid-summer green" when this rating was taken, March 22nd, 2006.



Seed Mixtures:

Are They the Cure for Necrotic Ring Spot?

Necrotic ring spot (NRS) of Kentucky bluegrass is one of several patch diseases caused by the fungus *Ophiophaerella korrae* (formerly *Leptosphaeria korrae*). NRS is prevalent throughout Canada and the northern United States. It is a root-infecting parasite that



Dr. Brede shows a data point to fellow researchers at the International Turfgrass Research Conference in Wales. His scientific paper reported on an 8-year experiment on necrotic ring spot (NRS) disease performed at Jacklin.

produces the familiar "frog eye" circular patches (see photo below).

Jacklin Research Exclusive

One control strategy that's been suggested for NRS is mixing resistant turfgrass species in with Kentucky bluegrass. Richard Smiley found while he was at Cornell that perennial ryegrass and tall fescue were tolerant of the NRS fungus.

In August 1993, Jacklin Seed started an 8-year experiment to study the combined genetic resistance of Kentucky bluegrass cultivars, and ryegrass or fescue mixtures on NRS, to assess whether mixtures represent a

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Necrotic ring spot disease on Amazon (left) versus Adelphi (right) Kentucky bluegrass. Jacklin Seed's 5-steps-above® Kentucky bluegrasses are even more resistant to NRS disease than Adelphi.

Greenup, continued

performance of this elite class of bluegrasses. Chicago II was a step in the right direction. It greens up quicker than most. However none of the elite varieties green up quite as rapidly as the older, common-type varieties.

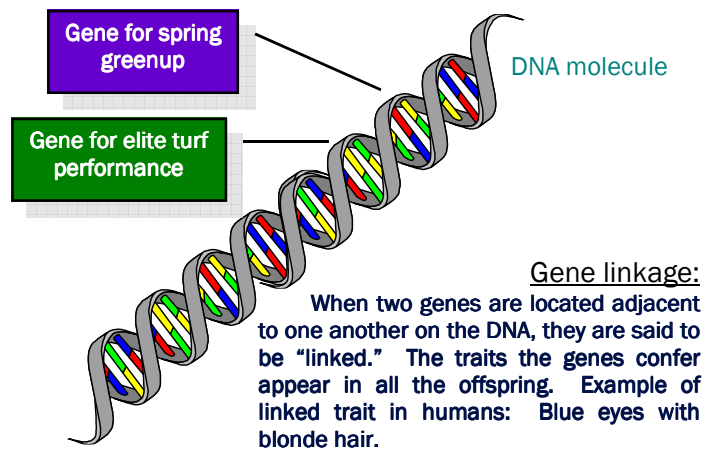
Linked traits

Geneticists call traits that are associated with one another as being *linked*. In the case of humans, a linked trait might be hair and eye color. People with dark hair often have dark eyes. The cause behind this linkage is that genes for the two traits occur consecutively on the same chromosome, migrating together as a paired set in reproduction. If you examine a large enough population – perhaps thousands of individuals – you discover exceptions to the linkage: A few folks with dark hair and blue eyes, for instance.

Botanists speculate that genes for premium turf performance of bluegrass originated eons ago in the Nordic region of Europe. Elite turf performance was probably an adaptation to close animal grazing, from sheep or reindeer. In this cold climate, late spring greenup was an asset – a survival mechanism against late-winter freeze damage. As a result, genes for greenup became linked with genes for a tight, dense turf.

Through years of crossing and re-crossing, I've finally been able to uncouple these two linked traits to discover a few individuals with both exceptionally early greenup and elite turf performance. Many springtimes I've seen these plants come out from under snow looking as vibrant green as they do on the first of June, suggesting the name *4-season™* or *All-Season™* turf.

Figure 1 compares several of our new varieties against a typical *5-steps-above®* standard in greenup at a northern California sod farm. The difference is amazing. Some of these varieties actually surpass common bluegrass in jumping into spring. This latest generation of Kentucky bluegrasses from Jacklin is set to debut in the marketplace in 2007. Seed samples will be available for your September 2006 trialing. 🌱



NRS, continued

viable long-term solution for NRS management.

Thirty Kentucky bluegrass varieties were tested. All were popular varieties in 1993 when the trial was planted; some have since become obsolete. Each bluegrass appeared in three replicates and in four different mixture treatments: (i) Advent perennial ryegrass mixed with bluegrass, (ii) MX-86 sheep fescue mixed with bluegrass, (iii) Pixie tall fescue mixed with bluegrass, and (iv) a bluegrass monoculture (i.e., straight bluegrass).

Of the 30 bluegrasses chosen for this study, six were European ecotypes. Of those six, four had 6 or more NRS spots per plot (Amazon, Cheri, Julia, Limousine). All North American ecotypes had fewer than 5 spots per plot. This observation might tempt one to conclude that European germplasm has not been naturally screened against NRS. However, Apex – a Swedish landrace – displayed the top ranking for NRS resistance, fewest infection center spots, and least infected plot area. That may in part explain its high turf quality ratings over the duration of the trial.

With some bluegrass cultivars, the mixture grass was forced out almost entirely, leaving essentially no resistant companion species. With other bluegrass cultivars, the mixture grass survived in moderate to high populations but did not abate NRS symptoms. The mixture grass alone could not entirely compensate for a susceptible bluegrass cultivar. Adding perennial ryegrass or tall fescue to a bluegrass in several cases did decrease NRS, but the better, long-term solution to cultural control of NRS is to seek highly resistant Kentucky bluegrass cultivars and consider a mixture grass only as added insurance. 🌱

Experimental results

- Adelphi, Apex, Eclipse, Kelly, NuBlue, Nugget, NuStar, and Wabash Kentucky bluegrass were NRS resistant.
- Ryegrass populations all started out as 20% ryegrass seed and after 8 years varied from 3% plants in mixtures with Apex Kentucky bluegrass to 48 to 50% ryegrass with Aspen, Liberty, and Suffolk.
- Tall fescue populations varied from 0% with Apex to 38% with Fyking after 8 years.
- Sheep fescue did not persist beyond 3 years in mixtures with Kentucky bluegrass.
- Addition of perennial ryegrass to Kentucky bluegrass reduced NRS 24%, addition of tall fescue reduced NRS 22%, but these benefits occurred only among the four most NRS-susceptible bluegrass cultivars.
- Mixing other turfgrass species with Kentucky bluegrass may not be as effective a control strategy for NRS as simply utilizing resistant bluegrass cultivars.
- If you're interested in reading the entire study as published in the ITRC Proceedings, email kathy.pintler@simplot.com.