

Four Unconventional Grasses to Know and Love

By Doug Brede, Ph.D.

Most turf managers can probably count on two hands all the grass species they've grown and mowed over the years. These same 10 grasses can take the average person from cradle to grave without any sweat. But we both know *you're* not an average person, or you wouldn't be reading *TurfGrass Trends*, right?

The "Big-10" turf species – bluegrass, fescue, rye, bermuda and the like – comprise probably 90% of turfgrass grown in this country. The remaining 10% falls into a category I call the unconventional turfgrasses – a group of perhaps 400 lesser known species, with varying levels of turf suitability. So what would drive a person to take the plunge into the wild world of unconventional turfgrasses? And what benefits do they offer that the "Big-10" turfgrasses lack?

Think about your turf facility for a moment. Do you have a spot that is hard to keep grassed? Maybe it dries out prematurely. Maybe it is shady or stony or excessively cold. It's spots like those that can drive a good manager nuts. It's also a good place to try an unconventional grass.

Knowing when and where is the secret to these grasses. In this article, I'm going to introduce you to a couple grasses you've probably heard of – but never knew when to plant – and a couple you've probably never heard of at all. And I'll explain how to put them to work to fill those crazy spots you just can't seem to keep green.

What's with wheatgrass?

Most turf folks have heard of crested wheatgrass and have seen textbook photos of how it blankets miles of Kansas roadways. But beyond that, they have little appreciation of where it might fit in their landscape.

Wheatgrass has a couple of noteworthy firsts to its record. 'Fairway' crested wheatgrass was the very first turfgrass cultivar ever developed. Fairway was released from the

University of Saskatchewan in 1932, decades before the dawn of 'Penncross' and 'Merion.' Wheatgrass has also been credited with saving America from the Dust Bowl, which devastated crop and rangeland in the 1930s and plunged the Central Plains into depression.

The wheatgrass family is comprised of 100 Eurasian species and 22 to 30 North America natives. They are a fractured clan of grasses all distantly related to cultivated wheat grain (1). This connection has led wheat breeders to the wheatgrasses in hopes of creating inter-species crosses. Their goal is to invent the elusive perennial wheat which, if developed, could be planted once and would yield grain each summer without repeated tillage and resowing.

Originally, plant taxonomists lumped all the wheatgrasses together under *Agropyron cristatum*. But recent work at Utah State University (Figure 1) has regrouped these grasses into other genera. Only crested wheatgrass has remained among the *Agropyron*. Some wheatgrasses were switched to the *Pascopyrum* genus, others to *Thinopyrum*, and a few to the new *Pseudoroegneria* genus.

This reclassification was not merely a Latin name change. No, it went so far as to take varieties of the same species and split them into distinctly separate species. As a result, you'll find confused buyers and sellers clinging to the old Latin names in their

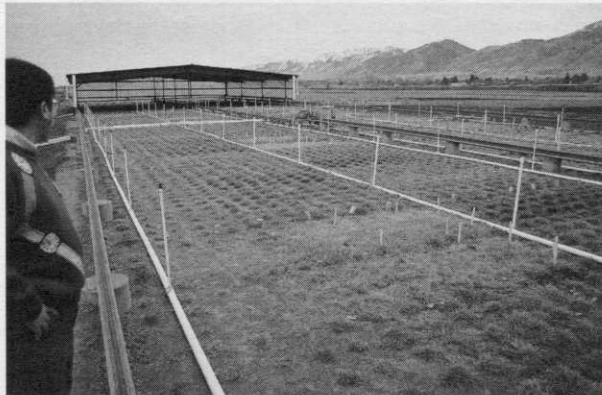
Fairway crested wheatgrass was the very first turfgrass cultivar ever developed — back in 1932.



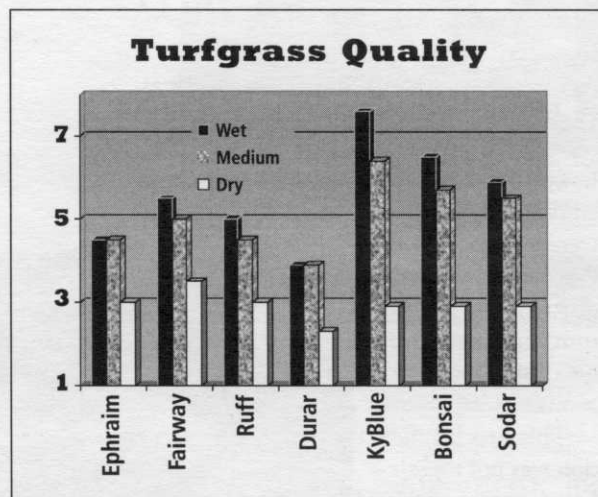
'Roadcrest' (rear of photo) and 'Ruff' (foreground) crested wheatgrass plots at Utah State, showing their turf adaptation under limiting moisture conditions. These grasses hold promise for roadsides and for drought-affected, low maintenance sites on golf courses and parks.

business transactions. Both the old and new Latin names are used almost interchangeably in seed catalogs.

Crested wheatgrass is the most turf-worthy member of the wheatgrass clan. It is native of the Steppe region of Russia, introduced to North America in 1892. Crested



Automated rainout shelter experiment at Utah State University in Logan. A movable roof (left, rear of photo) rolls into place when sensors detect precipitation, allowing researchers to gauge drought tolerance based solely on irrigation levels. This facility was used in the development of the data in Figure 1.



*Fig. 1. Summer turf quality of 7 grasses at Utah State University, Logan, UT, maintained under 3 moisture regimes (2). The trial was conducted under a sophisticated rainout shelter (see photo) which automatically closes when it senses precipitation. 'Ephraim,' 'Fairway,' and 'Ruff' are crested wheatgrasses, 'Durar' is a hard fescue, 'Bonsai' is a tall fescue, and 'Sodar' is a streambank wheatgrass (*Elymus lanceolatus*). The lsd0.05 values for the wet, medium, and dry treatments were 0.4, 0.4, and 0.6, respectively.*

wheatgrass is well suited to the semiarid climate of the Great Plains and has become one of its prime rangegrasses. It also prospers on drier sites along the East Coast.

Fairway wheatgrass has found use in a number of turf applications, including roadside, lawn, park, and even a few golf fairway plantings. It is persistent and competitive against weeds, as long as the cutting height is not too short and it's not given too much irrigation. Wheatgrass – like many prairie-grasses – loses its competitive edge against weeds when supplied with too much irrigation.

In recent decades, Kay Asay and Kevin Jensen, USDA researchers in Utah, have taken the lead in wheatgrass technology. Their work has led to the recent release of 'Roadcrest,' a rhizomatous cultivar with improved turf characteristics (see photo on page 9).

Asay and his colleagues have also performed a number of management studies on wheatgrass, comparing its drought tolerance with the traditional turf species (Fig. 1). He concluded one study by stating that "all the crested wheatgrass entries were easier to establish and initiated growth earlier in the spring than Kentucky bluegrass, hard and tall fescue, thickspike wheatgrass and perennial ryegrass."

Asay found that 25 to 30 lbs./acre seeding rate was the highest practical rate for wheatgrass. At higher seeding rates, wheatgrass became prone to damping off. "Fungal diseases occurred in the wheatgrass during seedling establishment when subjected to irrigation levels and heavy seeding rates recommended for Kentucky bluegrass, tall fescue and perennial ryegrass," he concluded.

A steady supply of relatively inexpensive crested wheatgrass seed has launched this species into a number of mowed and unmowed turf applications.

Detractors argue that crested wheatgrass is overused and other grasses would be better suited. They lament that wheatgrass is used in solid plantings rather than in mixed stands, limiting genetic diversity. They cite the fact that crested wheatgrass is an introduced grass, not one native to North America.

Yet in spite of its criticism, the value of crested wheatgrass is unmistakable. Crested wheatgrass' water-use efficiency, relatively good mowing tolerance, resistance to salinity and ability to crowd out noxious weeds has made it a valuable lawn and conservation grass for the drier, cooler parts of the world.

If it's June, this must be Junegrass

Prairie Junegrass (*Koeleria macrantha*) is on the verge of becoming a mainstream turf species. For years, marketers at Barenbrug, a multinational seed company centered in Holland, have been promoting their "new" variety of Junegrass called 'Barköel.' Barköel was an accidental discovery by company breeders in 1973 who thought they were picking up eye-catching plants of perennial ryegrass.

Junegrass looks and acts most like perennial ryegrass and can be used in similar applications on a golf course.

"The original breeding stock for Barköel was located by chance on an old British golf course," says Barenbrug's Michel Mulder (8). "Despite drought and infertile soil, certain attractive plants were found thriving whilst others suffered."

Junegrass looks and acts most like perennial ryegrass and can be used in similar applications on a golf course. While the Barköel variety can be used on fairways, 'common' Junegrass is better suited to roughs and out-of-play areas due to its coarser texture.

Acceptance of Junegrass in the marketplace has been slow, probably owing to its lower yields and higher seed prices than perennial ryegrass, its chief competitor. Junegrass' main advantages over ryegrass is its wear tolerance and super high shoot density. In British wear trials, Barköel regularly comes out near the top of the trial. It is uncertain whether the same can be expected in the continental U.S. due to the hotter, drier summers.

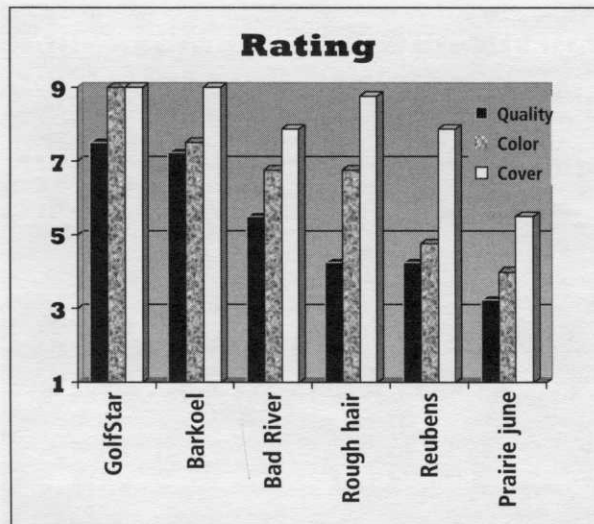


Fig. 2. Turfgrass quality, color and ground coverage of 6 grasses at Carman, MB, judged on their adaptation to low maintenance golf course sites (6). The trial was repeated at Winnipeg, MB, with similar results.

'GolfStar' is an Idaho bentgrass (*Agrostis idahoensis*), 'Barköel' is a prairie Junegrass, 'Bad River' is a blue grama, rough hairgrass is *Poa scabra* and 'Reubens' is a Canada bluegrass (*Poa compressa*). The rightmost bar of prairie Junegrass is a Canadian ecotype of *Koeleria gracilis* from Prairie Seeds. The lsd0.05 values for quality, color and cover were 1.0, 1.8, and 1.0, respectively. Ratings were on a 1 to 9 scale, with 9 equal to best. Cover ratings were transformed from a % scale to fit this axis.



Koeleria (Junegrass) is a common, cool-season bunchgrass throughout much of the world. You may have seen it and never knew what it was. Certain prairie Junegrass ecotypes possess turf adaptation.

Junegrass is not unique to Europe. It can be found in nature throughout much of the globe. Local ecotypes range from coarse to fine bladed. Most southern ecotypes are susceptible to winter damage.

In recent years, Anthony Mintenko and Ray Smith of the University of Manitoba have tested Junegrass for its adaptation to

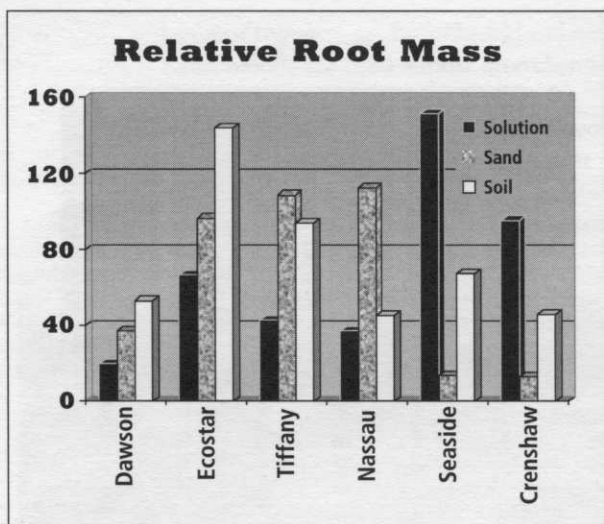


Fig. 3. Relative root mass of 6 grasses grown on aluminum-enriched media (5). Aluminum toxicity is an indicator of low-pH and heavy metal tolerance. 'Dawson' is a slender creeping fescue, 'EcoStar' is a hard fescue, 'Tiffany' is a Chewings fescue, 'Nassau' is a Kentucky bluegrass, and 'Seaside' and 'Crenshaw' are creeping bentgrasses. The grasses were tested in 3 growing media: Solution culture (which lacked a soil of any type), fine sand, and Tatum soil from Orange, VA, with a pH of 4.4.

lower maintenance golf course sites (6). Results have been promising (Fig. 2).

"In the summer months, the top entries were the cool-season grasses, 'GolfStar' Idaho bentgrass and Barköel Junegrass, followed by the warm-season grass, 'Bad River' blue grama," says Mintenko. "Blue grama maintained a consistent color during the peak heat periods of summer and, surprisingly, the two cool-season grasses mentioned above also held their color. The native Alberta prairie Junegrass showed poor quality and color when subjected to summer heat stress."

In the past two years, breeding powerhouse Rutgers University has got into the Junegrass business in a big way. They've made Junegrass collections in Europe and North America and are hybridizing them to produce improved varieties.

Remember, people laughed in 1967 when Rutgers originally brought out 'Manhattan' perennial ryegrass, saying there was little future in that species. Early indications are that history is about to repeat itself.

You're looking mighty slender today

Nearly every turf manager in the temperate zone has used fine fescue at one time or another. It performs well under trees because of its outstanding shade tolerance. The delicate, needle-like leaves of fine fescue combine well with other cool-season turfgrasses.

There are five basic species of fine fescue: Chewings, strong creeping red, slender creeping, hard, and sheep. Most people are familiar with the first two. And for low maintenance conditions, hard and sheep have become popular. But for many people, slender creeping fescue is a mystery.

Slender creeping fescue (*Festuca rubra* ssp. *litoralis*) is most similar to creeping red fescue (as its Latin name implies) but it has smaller seed, a smoother leaf sheath, and longer, thinner rhizomes. To generalize, slender creeping fescue forms a dense, light green, slightly less drought tolerant turf than its strong creeping red cousin. Of course, there are immense varietal differences among the two species.

There are five basic species of fine fescue: Chewings, strong creeping red, slender creeping, hard and sheep.

Depending on who you talk to, slender creeping fescue is either heaven or hell. Europeans love it. For them, slender creeping fescue produces a dense, fine-leaved stand with a compact growth habit.

In America, however, the National Turfgrass Evaluation Program (NTEP) trial has been ruthless to the slender creepers (7). Varieties of slender creeping fescue inevitably end up near the bottom of the trial results.

About 10 years ago, my company submitted 'Logro,' a European-bred slender creeping fescue into the NTEP trials. Logro had long been a top European performer. But for all five years of the NTEP trial, it held a stranglehold on last place. Some within our company commented that

'NoGro' might be a more appropriate name.

The slender creepers prosper under a cool, moist, European climate. In Canada, slender creepers perform best in coastal zones, where it tolerates shady, damp soils. Slender creeping fescue also has a reputation of good resistance to heavy metals. However, recent studies have shown that its heavy metal and low pH tolerance are only moderate compared to other popular turf varieties (Fig. 3). Slender creeping fescue has slightly better salt tolerance than other fine fescues, but it is not as tolerant as weeping alkaligrass.

Newer slender creeping fescues like 'Bar-crown' and 'Seabreeze' offer improved turf quality and low cut tolerance and have performed well in places like Pennsylvania (4) and Europe.

Australia's best since Crocodile Dundee

When discussing new and innovative grasses, Australia generally doesn't come to mind. But it should. Aussie breeders have been busy in recent years quietly discovering and developing a host of native turfgrasses.

The climate across the populous part of Australia ranges from a cool, marine climate in the south to tropical in the north. The bulk of the country is an arid Mediterranean climate, reminiscent of Colorado or California. Some of the Australian native grasses



Under low maintenance conditions, weeping grass from Australia forms a moderately dense turf, reminiscent of perennial ryegrass. The variety 'Griffin' was bred for turf, 'Shannon' for roadsides and 'Wakefield' for pasture.

ADDITIONAL READING ON ALTERNATIVE GRASSES — ONLINE

Readers with an Internet connection can find more information on these and other alternative turfgrasses at the following web sites:

■ **USDA plant species search engine –**

<http://plants.usda.gov/plants/>

■ **Australian native grasses –**

<http://www.shoalhaven.net.au/~farrar/seedpg24.htm>

■ **Characteristics of any grass in the world –**

<http://biodiversity.uno.edu/delta/grass/index.htm>

■ **Low maintenance grass seed by mail –**

<http://www.seedsources.com/shop2/index.htm>, or

<http://www.sunmarkseeds.com/>, or

<http://www.graniteseed.com/>, or

<http://www.jacklingolf.com>

hold potential for filling the turfgrass needs for similar regions in North America and around the world.

Weeping grass (*Microlaena stipoides*) is a cool-season grass found only in Australia, New Zealand and adjacent islands. Like Junegrass, it occurs in a wide range of growing conditions and ecotypes. Some of these ecotypes have shown possibilities for turf, including mowing tolerance down to 1-in. cut. Under mowing, weeping grass can develop high density, moderate to fine leaves, and a low fertility requirement. One particular endearing feature is its tolerance of low light and shade – a trait that's lacking in most warm-temperature grasses.

Weeping grass resembles a perennial ryegrass with rhizomes. In turf, it grows in a somewhat bunchy, weeping fashion, as its name implies. It stays green all year, including the winter and during moderate heat and drought in summer.

Seed germination is not as quick as perennial ryegrass but more similar to Kentucky bluegrass. Shallow planting and a mulched seedbed enhance emergence. The seed also possesses a whisker that should be removed during seed processing to improve germination and flow through a spreader.

Trifluralin can even be used during planting to eliminate weed emergence, while permitting the weeping grass to grow normally.

Management studies at the University of Melbourne indicate that weeping grass is tolerant of the usual preemergence herbicides, such as trifluralin and pendimethalin (3). Trifluralin can even be used during planting to eliminate weed emergence, while permitting the weeping grass to grow normally. Ethofumesate, dithiopyr and bensulide are not recommended.

Seed of weeping grass is produced in commercial quantities in Australia and is available for export to the US. 'Griffin,' 'Shannon' and 'Wakefield' are improved varieties, with the former being bred for turf. Most larger seed houses can obtain seed upon request. Remember, seed harvest in Australia occurs in February. Waiting until August to place your order may leave you empty handed.

— *The author has had a lifelong fascination with low maintenance grasses. Brede earned a Ph.D. degree at Penn State University, working as an assistant superintendent for a 27-hole golf course near Pittsburgh, PA, in between degrees. After graduation, he took a job at Oklahoma State University, replacing Wayne Huffine, a noted roadside turf researcher. He continued two of Huffine's long-term projects on low maintenance turf and pursued a variety of fine turf interests. After receiving tenure, he was off to take the research director's job at Jacklin Seed/Simplot Turf & Horticulture in Post Falls, ID, where he works today. Brede recently authored a book dealing with useful ways for lowering your turf maintenance – making turf care easier rather than more complicated. The book, entitled "Turfgrass Maintenance Reduction Handbook - Sports, Lawns and Golf," is at the presses and is expected to ship in August. The book lists 400 additional unconventional grasses, other than the 4 mentioned here – all with turf possibilities. You can find the book on the web at Amazon.com and the publisher (www.sleepingbearpress.com).*

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This article is the first in a series for Turfgrass Trends, describing in detail four grasses from among the hundreds you can know and grow. If you find this information useful, please let the publisher know. If there are varieties you are considering for your operation that you would like discussed, drop Doug Brede a note at rpower@jacklin.com or 208/773-7581 x224 and he might discuss them in another article down the road.