

TURFGRASS TRENDS

TURF BREEDING

What Will Future Turfgrasses Bring?

By Doug Brede

Imagine trying to predict what people's likes and dislikes will be in 10 years. By 2014, pundits might forecast that America will have a permanent base on the moon, that people will watch feature-length movies on cell phones, and that computers will be as fast and powerful as the human brain (though they'll still crash when under stress).

Welcome to my world. I'm the turf breeder for a major West Coast seed company. My job is to anticipate what people will want a decade from now. That's how long it takes to develop a new turfgrass variety from the point of conception to full seed production. Varieties I'm designing today won't be in your hands until 2014.

In this article I'm going to give you a taste of what's likely to come your way in turfgrasses over the next decade. As your guide to the future, I'll point the way with a sprinkling of bold prognostications. Then, after each prediction, I'll explain why each is likely to come true. So let's get started — the future's wasting.

Prediction: Creeping bentgrasses will get even denser.

Shoot density is a tally of the minuscule creeping bentgrass plants on 1 square inch of putting surface. Some folks clock shoot density on a "square decimeter" basis (a square decimeter equals 15.5 square inches), but I prefer the more familiar square inch.

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Putting green plugs of (left to right) T-1, Penn A-4, Penncross and Poa annua from test plots mowed at five-thirty-seconds of an inch and fertilized with 3 pounds of nitrogen per 1,000 square feet per year. These varieties show the progress in shoot density and upright growth from older bentgrasses

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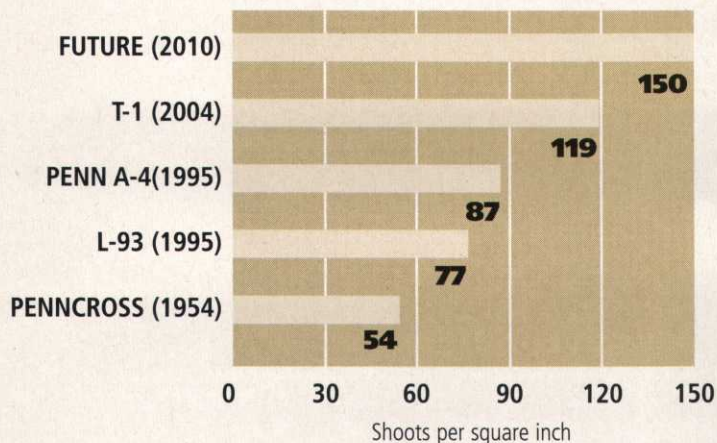
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FIGURE 1

Progression of creeping bentgrass shoot density, from Penncross (released in the 1950s) to today's T-1 to future releases:



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More plants means truer putting, more fullness and a visually appealing surface. But higher densities have another important function: There is a direct relationship between bentgrass shoot density and competitiveness with annual bluegrass. A bent that can generate a lot of lateral shoots will push *Poa annua* around.

Ten years ago I thought we'd seen the pinnacle of shoot density when retired Penn State breeder and my mentor, Joe Duich, released the Penn A series of bents. These bents set new density standards that persisted for a decade. This year, however, a variety will finally shatter that record (Figure 1). T-1, which I developed, is 36-percent denser than even Penn A-4 (photograph on page 49).

Over the next decade, I predict the record set by T-1 will be breached by even denser bentgrasses. The limiting factor, of course, will be thatch. Dense varieties sometimes develop thatch. It's as if their metabolic rate for shoots and thatch has been turned up on overdrive. But from what I've seen in my breeding plots, it is possible to select shoot density independently of thatch. In other words, it is entirely feasible to breed a low-thatching bent variety, with high shoot density. Such a variety would bring high-density greens to the average golf course.

Prediction: Bentgrass genetics will make a major leap in disease resistance.

When asked what they'd like to see in a

future bentgrass variety, most superintendents answer, "Better disease resistance." Routine diseases like dollar spot have become so expensive to manage that disease resistance easily beats resistance to other pests in preference surveys.

L-93 was a major step forward in fungal resistance when it was released in the 1990s. Rutgers researcher Jim Murphy and his colleagues found that 88 percent fewer dollar spot fungicide applications were required to manage L-93, compared to susceptible varieties (Vaicunas et al., 2002).

New research work is attempting to transfer additional dollar spot resistance from colonial and velvet bent into creeping bent. This process involves interspecific hybridization — the crossbreeding of two different grass species. Lead researcher Faith Belanger reports: "We have produced interspecific hybrids between creeping bentgrass and colonial bentgrass and field-tested them against dollar spot. Some of the hybrids had excellent dollar spot resistance, exhibiting essentially no disease symptoms" (Belanger, et al., 2004).

While this is a major advance, much work still remains to incorporate resistance to other diseases.

Future bentgrasses, I predict, may require only two or three fungicide applications per year for dollar spot, even in tough climates.

Furthermore, I predict these advances in disease resistance will come from conventional breeding, and not from laboratory gene insertion. Here's why:

Prediction: Biotechnology will play only a minor roll in turf varieties over the next decade.

Transgenic biotechnology makes it possible for scientists to move genes from anywhere — from animals, plants, and even bacteria and viruses — and insert them into grasses. This opens opportunities not possible with conventional plant breeding.

Among the agronomic crops, the impact of biotechnology has been stellar. This year more than 70 percent of the U.S. soybean crop was planted to transgenic seed.

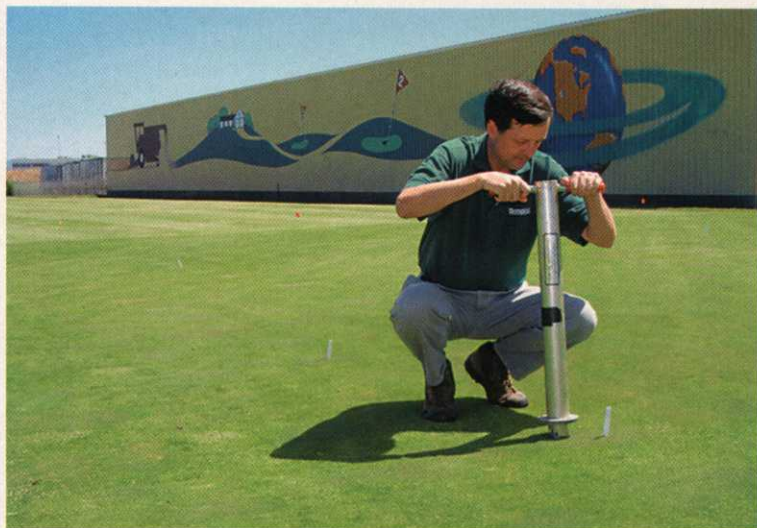
I forecast we'll see a much slower adoption of biotech with turf than has occurred with farm crops. For one reason, turf isn't replanted each year like farm crops. And second, there are no slam-dunk traits that can easily be added with a single inserted gene. Unlike soybeans, weeds in turf are only a minor nuisance and herbicides are

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QUICK TIP

Learn more about the hot new grasses in the turf industry, Thermal Blue and the newest addition, Dura Blue, by visiting our Web site, www.scottsproseed.com. Both varieties continue to make a statement in the warmer regions of the United States and are making superintendents think twice about using tall fescue in their roughs.



Story author Doug Brede selects creeping bentgrass breeding strains at his research farm in Idaho.

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relatively cheap and effective. Even annual bluegrass may be controllable with upcoming chemistry from Valent and Monsanto.

To borrow lingo from the software industry, turf biotech needs a killer application to create a successful product. A killer application is the ultimate must-have product—one that will do miraculous things.

Cost is another stumbling block to biotech. Transgenic varieties are regulated like a pesticide, requiring exhaustive federal testing and approval.

Prediction: More oddball grasses will hit the market, but sales will be slow.

Over the past decades, the vocabulary of the average turf manager has stretched to include such new terms as “improved buffalograss,” “turf-type tall fescue” (an oxymoron), and other novelties. In the future I predict we’ll see even more diversions from mainstream turfgrasses as breeders attempt to develop new tools to solve old problems.

James Reed, a breeder at Texas A&M’s Dal-

las station, started this craze when he crossed Huntsville Kentucky bluegrass with a then-obscure native: Texas bluegrass, *Poa arachnifera*. Reed’s program released “Reveille” hybrid bluegrass, which is sold through Gardner Turf Farms. Reed’s idea was to create a bluegrass that would breach the transition zone and carry bluegrass south into Oklahoma and Texas.

A plethora of other new turf species are poised for launch. Many of these grasses solve longstanding problems such as waterlogged soils, heavy shade or salt.

But the southern trek hasn’t been easy. Seed production of Texas bluegrass is nagged by low yields and cottony seed. Fuzzy seed clogs up most whirly bird and drop seeders and requires hydroplanting.

A plethora of other new turf species are poised for launch. Many of these grasses solve longstanding problems such as waterlogged soils, heavy shade or salt. But acceptance of these novel grasses by the industry is proving disappointing. One company blends off its new velvet bentgrass into its reclamation mixes, because demand has never developed for velvet bent golf greens.

Seed company administrators are becoming jaded about the idea of trying other oddball grasses. Thus, while I think you’ll see many new grass species enter the trade in the future, sales will be unusually slow.

Doug Brede, research director and one of three operating officers for Jacklin Seed (part of the J.R. Simplot Co., in Post Falls, Idaho), has developed more than 60 popular turf varieties.

To see the full text of this article plus more predictions and a list of unusual turfgrass species to look for in the future, please go to:

turfgrasstrends.com

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