Comparing the New Bents

Instead of searching for the mythical "champion" bentgrass, look for types that are best adaptedto the unique conditions of your course.

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The recent availability of numerous new creeping bentgrasses has, for some golf-course superintendents, seemed more like an onslaught than a salvation. Deciding which of the new cultivars are best, whether to plant a single cultivar or a blend and how the performance of the new bents may affect management practices is not simple. A superintendent's life may have seemed easier when there was only Penncross to buy, plant and manage. It might be some consolation to superintendents to realize that, at one time, acquiring seed of any bentgrass was a challenge.

A Colorful History

During the late 1800s and early 1900s many golf greens consisted of red fescue and Kentucky bluegrass. In the early 1900s, what was then known as "South German" bentgrass (SGB) revolutionized the golf industry. Superintendents ("greenskeepers" then) across America were switching to SGB.

However, the composition of SGB seed was highly variable. "Good" SGB seed contained 40 to 60 percent colonial bentgrass, 5 to 40 percent velvet bentgrass and 5 to 15 percent redtop, but only a trace of creeping bentgrass. Even though the "good" SGB contained only a trace of creeping bentgrass, it was enough that, over time, greens would eventually become mostly creeping bentgrass or a mix of creeping and velvet bentgrass. "Bad" SGB seed didn't contain even a trace of creeping bentgrass seed and typically consisted mostly of redtop, a bentgrass of forage quality.

During World War I, the supply of SGB seed dropped to such an extent that superintendents faced enormous pressure to only use what they absolutely required so that "the other fellow" would have enough.

Tight supplies, high prices and the variable quality of SGB seed lots eventually forced superintendents to look for alternatives. In the early 1920s people began to notice creeping bentgrasses segregating out as large, distinct patches on older greens (20 to 30 years old). Some of these patches were aggressive and exhibited high shoot density, fine leaf texture and better resistance to brown patch than SGB. Selection and vegetative propagation of these bentgrasses eventually enabled clubs across America to become independent of European supplies, thus beginning the era of vegetatively propagated bentgrass. Soon, many clubs switched to vegetatively propagated bentgrasses.

The reason these bentgrasses needed to be vegetatively propagated is that creeping bentgrass is a cross-pollinated species. This means that to produce seed, a plant's flowers must be fertilized with pollen from a different, genetically distinct plant. The result is that no two seedlings are genetically alike. Seed propagation would therefore not preserve the desired characteristics. By contrast, vegetative strains selected and propagated from a single patch consistently produce high quality because, lacking genetic variability, they are completely uniform. Early greenskeepers knew that one of the secrets of maintaining vegetative bentgrass was to prevent your nursery from flowering, thereby setting seed and contaminating the pure vegetative stand with variable bentgrass seedlings.

These strains' lack of genetic variation was also a disadvantage. If a strain became susceptible to a particular disease, an entire green or even a whole course would be at risk. Equally important, perhaps, was the problem of repairing damaged areas, which required either sodding or stolonizing.

Compared with seed, commercial sod is difficult to distribute, which sometimes made it hard to find the material to repair greens. Therefore, seeded bentgrasses remained a sought-after commodity. One commercial source of bentgrass seed did exist in North America. It was known as Rhode Island Bent, but it was a colonial bentgrass that was highly susceptible to brown patch (as was SGB). However, natural stands of creeping bentgrass existed along the Eastern Seaboard and the Pacific Northwest coast of the United States, and these were thought to be potentially useful. Unfortunately, the seed proved too difficult to harvest until the early 1920s, when Lyman Carrier WHO IS THIS? found a stand of bentgrass that produced enough seed to allow for mechanical harvest. This source became known as Seaside creeping bentgrass. For many years, superintendents had a choice of stolonizing with a vegetative bent or seeding with Seaside.

A Star is Born

From the 1920s through the 1950s, turf breeders continued to collect vegetative samples from the segregating patches of creeping bentgrasses on older greens. The U.S. Golf Association and the U.S. Department of Agriculture systematically conducted these collections. In 1954, Dr. H. B. Musser at The Pennsylvania State University developed the first "synthetic" cultivar of creeping bentgrass by crossing the vegetative strain PennLu with two other vegetative samples from the USGA/USDA collection. The result was 'Penncross': more aggressive, dense and disease-resistant than Seaside.

Soon, Penncross became the industry standard and remained so for many years. That is, until the recent introduction of what are known as the "new generation" bents-a collection of improved cultivars originating from multiple sources and often having specific adaptations and enhanced management requirements.

It's interesting to note that, because bentgrass flowers are mowed off at green height, no actual breeding takes place on greens and no new types come into existence. Thus, any existing bentgrass plants on a green must have been there since it was last seeded. The conditions on golf greens simply favor some types more than others, so greens maintenance automatically "selects" for the plants that are best adapted to greens use.

(Continued on Page 25)

Bentgrass--

(Continued from Page 25)

The Next Generation

As with Penncross, the new bentgrass cultivars have been selected and developed from patches on old golf greens. Unlike Penncross, however, the new bents' parents survived under more modern conditions of close mowing heights, high traffic and a greater variety of temperature extremes. Thus, the conditions on greens that selected the parents of Penncross were different than the conditions that have selected (and continue to) the best of the progeny of Penncross.

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When breeders collect these surviving progeny from greens and then breed them, their genetic information is shuffled like so many playing cards, creating offspring with entirely new genetic combinations that potentially are even more adapted to greens conditions than their parents. This is, essentially, how the new bents have been created.

Many of the new bents are more specialized than Penncross, which is relatively widely adapted. In addition, the new bents typically have finer leaf texture, higher shoot density and more upright growth. These characteristics tend to give them a higher overall turf quality than Penncross. Further, the new bents generally show less grain and tolerate closer mowing heights.

Much of the breeding activity in creeping bentgrass has been aimed at developing bents that will perform better in the South. There, hybrid bermudagrasses are highly sensitive to the occasional cold spell. The winter of 1984, which killed many bermudagrass greens, prompted many courses to replace their bermudagrass greens with creeping bentgrass. However, the bentgrasses available at that time were often severely stressed by the summer heat of the South. New, heat-tolerant varieties have helped fill the need for bentgrasses adapted to the South.

On the other hand, some new cultivars of creeping bentgrass have been specifically developed for more northern climates. Thus, the choice of which new bent to grow really depends on where you'll grow it and how you'll maintain it.

Sometimes the original parents of a cultivar can provide some insight as to what to expect in the offspring. For example, the parent germplasm of Crenshaw came mostly from Southern origins (Arizona and Texas) while Cato had more mixed parental sources (Texas and Michigan). The addition of more Northern germplasm may be one reason why Cato exhibits better dollar spot resistance than Crenshaw.

So, how far have we come? To put it in perspective, consider this statement by Fredrick Hood, the superintendent at The Country Club (Brookline, Mass.). In 1922, when the acceptable greens height of cut was between 1/2 to 3/8 inch, Hood wrote, "The length to which the grass is permitted to grow varies with individual taste, but, as a rule, the grass on putting-greens in America is cut too short for real skill in putting." You be the

(Continued on Page 29)

Bentgrass--

(Continued from Page 25)

judge.

Choosing the Right BentgrassCultivars For You

* Do your homework. Before selecting bentgrass cultivars for new putting greens, do some research. There are databases of information that can help you, including the National Turfgrass Evaluation Program (NTEP) and the new On-site Bentgrass Testing Program, which evaluates cultivars under real-world putting green conditions. Consult your peers, USGA agronomists, university specialists and consultants. You might not have to risk trying a new variety if a nearby course is already growing one successfully. Just remember that nobody, no matter how close their course is to yours, has exactly the same conditions, so don't neglect seeking trial results. Also, ask seed company representatives about any special management requirements of their bent products. After you have narrowed your selection of bents down to several likely candidates, grow them out in a nursery area or practice green that you maintain just like your regular greens. You will be able to judge first hand how well your choices perform. You may find that you'll have to alter your management practices to fit the grass.

* Blending. Consider using blends for new putting greens. This practice, once frowned upon, has recently gained acceptance among many golf-course managers. But be careful. Blending is a balancing act that looks easy when done well, but requires experience. One of your best sources of information concerning blending is your seed representative. If you attempt blending on your own, use cultivars with similar texture, growth habit, density, aggressiveness and color. There is little value in including a disease-susceptible or otherwise inferior cultivar in the blend in hopes that its problems will be completely overcome by the other cultivars. Choose strong varieties only.

* Management. Many of the new bentgrasses require different management inputs than older cultivars. For example, some cultivars are more dense and build up thatch and mat faster than Penncross greens. This means that you may have to aerate, topdress and verticut more often to prevent puffiness. Also, fertility requirements of some of the new bentgrasses may be different from older cultivars.

Establishing any of the new bents into existing Penncross greens through overseeding might not result in a rapid conversion to the new bent. Due to the competitive nature of a well-established Penncross green, such conversion may require several years or more before the new bent cultivar predominates.

* Environment. Try to use cultivars that are well-adapted to the climate of your area and have good resistance to your problem diseases. Many of the new bentgrasses are adapted to specific environmental conditions, such as low mowing heights and summer heat stress; or perhaps low mowing heights, cold temperatures and snow-mold resistance; or low mowing heights and resistance to northern diseases like dollar spot.

The combination of factors that determine the criteria for selecting a bentgrass cultivar have changed. No single cultivar of bentgrass does best in all conditions. In other words, the decision of which bentgrass to plant should correspond to each superintendent's particular set of conditions. The choices available today can empower you to specialize your golf greens.

Drs. David Huff and Peter Landschoot are professors of turfgrass science at The Pennsylvania State University (University Park, Pa.).

What Suppliers are Saying About Their New Bents

Here is a sampling of comments about some new bentgrasses. The varieties reflect the overall choices available to golf courses-some fill specific needs, while others boast wide adaptations. However, all have been selected for characteristics that take them a step beyond traditional bentgrass greens such as Penncross.

Some of the most significant new bents were developed from selections in Augusta, Georgia, by Dr. Joe Duich of Penn State. Designated as the 'A' and 'G' series, these are marketed by Tee-2-Green. The 'A' and 'G' cultivars basically are greens-only varieties that thrive under-and even require-aggressive maintenance and very low mowing (1/8 inch) to fulfill their potential. According to Tee-2-Green, with proper culture, they produce fast, virtually grainless putting surfaces. Tee-2-Green also states that these varieties' fine texture and dense tillering resist spiking and help keep out Poa Annua. Deep roots improve heat, humidity and disease tolerance, as well as overall vigor.

Seaside II is another Duich selection (this time from Arizona) marketed by Tee-2-Green. Seaside II surpasses original Seaside for salt and heat tolerance, and overall turf quality.

One of the 'G' cultivars-Penn G-2-is carried by LESCA. G-2 covers the greens at Pinehurst and, according to Mark Laube, product manager for seed with LESCO, is a favorite of the pros. With extremely high density and upright growth, G-2 produces a non-graining, true-putting surface. Combine this with its good performance under low mowing heights-1/8 inch, and even down to 1/10 inch-and you can see why top golfers would enjoy G-2. G-2 doesn't require unusual fertility. Further, although aeration and topdressing are critical for preventing thatch buildup, Laube states that more frequent and lighter treatments are preferred to heavy topdressing and intensive aeration. Thus, disruption to play is minimized. "You basically can [aerate and topdress] in front of a golf group and it won't impede play," says Laube.

Two other LESCO varieties are Grand Prix (a new variety available in limited quantities) and Princeville. Laube describes these as more general-purpose "workhorse" varieties suitable for fairways and tees, as well as greens. In addition, Princeville shows the kind of salt tolerance you'd expect from a variety selected from ocean-side greens.

Agribiotech supplies three varieties-L-93, Crenshaw and Southshore. According to ABT's Dr. Richard Hurley, L-93's most notable asset is disease resistance. It has "no major weaknesses" in this area, says Hurley. It ranks at or near the top of NTEP trials in brown patch, dollar spot and snow-mold resistance in virtually all trial locations.

Another characteristic worth noting is L-93's density, which Hurley describes as "moderate to high." Though not quite as dense as some other new varieties, this is actually a benefit, according to Hurley, because L-93 requires less topdressing and aeration to prevent puffiness and thatch buildup-in other words, less management input. Hurley notes that L-93 is already used by more than 250 courses, so it has a solid real-world track record to back up its strong trial showings.

Crenshaw was selected for heat tolerance, and Hurley proclaims it the best variety available when it comes to bearing up under the summer sun. University research shows that this relates to its root development.

Southshore is a good all-around performer and rounds out ABT's selection of creeping bentgrasses.

(Continued on Page 32)

Bentgrass--

(Continued from Page 29)

Independent Seeds (a division of ABT) markets several varieties. Among them is 18th Green. John Zajac, who heads Independent Seeds, describes this variety as a specialty grass. It has excellent brown-patch tolerance, but is especially noted for its adaptation to cold temperatures. This is understandable, considering its Canadian origins.

Lopez, another of Independent Seeds' bents, "fits into the category of broadly adapted grasses and is used primarily in fairways and tees," says Zajac. However, Lopez seems to be compatible with Penncross and works well as an overseeded grass on older Penncross greens.

Century and Imperial are two more Independent varieties that display good density and disease resistance, and perform well in a broad range of conditions.

Seed Research has been a fairly prolific source of new bents. Providence has been a good performer in actual use for several years. From the same breeding program, Seed Research has introduced SR1119, which exhibits better color, texture and disease resistance. Skip Lynch, director of Seed Research's Golf and Sports Turf division, explains that SR1119 is a good compliment to either Providence or SR1020 (another of Seed Research's varieties) in blends. However, Lynch notes that SR1119 also is a valuable stand-alone variety that has gotten great reviews from superintendents. It's an especially good choice for the Northern tier where summer heat is short-lived but disease pressure is high.

Unlike other current Seed Research varieties, which are appropriate for tees and fairways as well as greens, Brighton is best suited to greens use. Brighton is sold under the Royal brand and hails from the SR1020 program, but exhibits disease resistance superior to SR1020.

Jacklin Golf markets Putter. Although this variety exhibits good general quality, its real strength is that it fills a couple of specific niches. One is disease resistance (to dollar spot and, especially, take-all patch), for which Putter was selected. The other, according to Mark DeBolt, director of Jacklin Golf, is resistance to Poa annua encroachment. Thus, although Putter is a respectable greens variety and a "good working bentgrass," especially where disease pressure is heavy, DeBolt says that superintendents are finding Putter to be particularly valuable as a fairway grass.

Jacklin also co-markets Brighton, the Seed Research variety discussed above.

Wayne Horman of The Scotts Co., explains that Scotts still markets ProCup, a good fairway bent. However, this variety will be phased out as Scotts focuses on its genetically modified, "Roundup-ready" bents. Herbicide-resistant bents promise to revolutionize greens maintenance and should hit the marketplace in a few years.

Turf Merchants Inc. carries two bents-Trueline and Backspin. According to TMI's Steve Tubbs, both have performed well in fairway use, which is becoming more prevalent in some regions due to gray leaf spot.

(Continued on Page 34)

On greens, Trueline, well-adapted to more cooler climates, is particularly useful for winter overseeding of dormant bermudagrass greens. Backspin, with its notable heat tolerance, is a good year-round variety for Southern greens. Tubbs notes that Backspin has been a strong performer on Southern greens in the ongoing On-Site putting green trials.

International Seed markets Viper and Cobra, but is phasing out the latter. Viper exhibits many of the strengths of Cobra (from which it is derived) but with increased density. International's Craig Edminster explains that although Viper does not have the density of the new "elite" types (such as Penn A and G, and L-93), it is considerably improved over Pencross in that and other characteristics. Thus, it is a good as a fairway grass because it isn't as prone to thatch as the "elites," and also produces a good putting surface suitable for courses not geared toward the high maintenance requirements of the high density types.

Pickseed West supplies Cato. Derived from the same breeding program as Crenshaw, it too shows good heat and drought tolerance. Another Pickseed variety, National, is described as "a robust, winter-hardy variety" well-adapted to northern U.S. and to Canadian climates. National also has excellent establishment characteristics, making it a good overseeding choice.

Barenbrug carries Regent, describing it as a widely adapted cultivar that resists several important bentgrass diseases. Barenbrug also carries Bardot, which it calls a "vigorous, disease-resistant variety for superb playing especially in fast, consistent putting."

Disease Resistance in Bentgrasses

The Achilles heel of bentgrasses has always been their susceptibility to fungal diseases. Every year, golf courses spend millions of dollars controlling diseases like dollar spot, brown patch and Pythium blight. This is part of what makes golf courses targets for environmental groups, which single them out as pesticide-intensive management systems. Consequently, many breeders have intensified their efforts to find bentgrasses with good disease resistance.

Recently, some seed companies have contended that certain bentgrass cultivars show improved resistance to one or more diseases. Sorting out such claims is confusing because resistance can have different meanings. There are varying degrees of disease resistance in turfgrasses, ranging from highly resistant to extremely susceptible. Complete resistance, where the grass simply doesn't get the disease, probably does not occur with any cultivar.

Although it would be convenient to categorize disease resistance as high, moderately high, moderate and low, and then relate these categories to the amount of damage you could expect, no such system exists with turfgrasses.

Consequently, claims of "high" or "moderate" disease resistance do not have much value. It's best to evaluate the degree of disease resistance of a turfgrass cultivar by comparing its reaction to a disease with that of other cultivars growing at the same site. Such comparisons are made by planting individual cultivars in small plots and then evaluating their disease resistance under the environmental and management conditions at the site. Such trials are conducted regularly by the National Turfgrass Evaluation Program (NTEP) and other research programs.

The NTEP coordinates evaluation of hundreds of turfgrass cultivars, including bentgrasses, at numerous locations across the United States and Canada. When a disease occurs in a test area, an evaluator assesses the amount of turf injury caused by the disease. These data, as well as other data on other aspects of cultivar performance, are compiled, analyzed and reported by NTEP. Understand that this is not a perfect system. For example, data may be incomplete or unavailable for certain diseases. Also, stresses that are common on golf courses, such as shading and

(Continued on Page 34)

Editor's Corner

By Steve Shumansky
Perham Lakeside Country Club

ALL WRAPPED UP....

By now all of us have, for the most part, finished all of our projects for the year and can finally take a deep breath and relax. Our irrigation systems are all winterized and our greens, tees and fairways put to bed and awaiting that first snowfall. Also getting ready for deer hunting for all of us that do so, as well as checking out the ice fishing house to be sure it's comfy enough for us to relax and kill some time over the winter months.

SEE YOU IN DECEMBER....

The time has come for all of us to make our reservations for the upcoming MTGF conference if you haven't already done so.

I always look forward to going to Minneapolis for this event. Either for the education or just to see a lot of old friends to visit with and talk about old times. Make sure you plan on coming to our MGCSA annual meeting as well this year. See you in Minneapolis!!

THANK YOU!

I want to take the time to thank all of you for putting up with my writings over the past three years. Being editor of *Hole Notes* has been very rewarding for me. I have had many nice compliments and support from many of you. But as all good things must come to an end, so does my time as your editor. Besides I have simply run out of intelligent things to talk about. Without Scott, Jeff and Ralph Turtinen, our *Hole Notes* wouldn't be what it is. I want to thank them most of all!

With that, I'll close. No more, "see ya next month."

— Steve Shumansky
Editor

Bentgrass--

(Continued from Page 32)

intensive wear, are not usually imposed by NTEP trials. Despite such limitations, NTEP and similar programs are about the only means of obtaining unbiased, comparative information on disease resistance of turfgrass cultivars.

A key point to consider when gathering disease information from cultivar trials is that turfgrass pathogens often have different strains or races that can affect cultivars differently. For example, race 'A' of a fungal pathogen may predominate at one location and injure cultivar 'X' more severely than cultivar 'Y'. At a different location, race 'B' of the pathogen may be more prevalent and cause more damage to cultivar 'Y' than cultivar 'X'. Thus, disease ratings from different locations will vary. In some cases, there may even be more then one race at the same location. Therefore, try to determine if disease-resistance trends are consistent for certain cultivars at two or three locations nearest you and are consistent for 2 to 3 years at the same location(s). If you see no consistent trends over locations and years, it may be premature to draw any conclusions about disease resistance.

When assessing the disease resistance of a cultivar, make sure that you look at its reaction to all diseases. Good resistance to one disease does not equate to good resistance to others. For example, in trials we conducted at Penn State, we were impressed by the resistance of a few colonial bentgrass cultivars to dollar spot and snow-mold diseases compared with creeping bentgrass. Unfortunately, most of these colonial bentgrass cultivars are much more susceptible to brown patch than creeping bentgrasses-a fact that limits acceptance of colonial bentgrasses on golf courses in the Mid-Atlantic region of the United States.

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