

THIS BENT'S FOR YOU UNDERSTANDING BENTGRASS PERFORMANCE

Frank Rossi
University of Wisconsin
Madison, Wisconsin

HISTORICAL PERSPECTIVE

In 1923, United States department of Agriculture Agristologist, Dr. Charles Piper and Agronomist, Dr. Russell Oakley wrote *Turf for Golf Courses*. In the chapter, *The Important Turf Plants*, they wrote; "Unquestionably the finest commercial grass for putting greens in the North is Creeping Bent." Back then, "Creeping Bent" was *Agrostis stolonifera* and the seed came from south Germany (hence the name South German Bent). Several other bentgrasses such as Rhode Island Bent (*Agrostis vulgaris*), Browntop or Velvet Bent (*Agrostis canina*) and Red top (*Agrostis alba*) were also mentioned as grasses used on golf courses. Interestingly, creeping bentgrass became *Agrostis palustris* in the US and remained *Agrostis stolonifera* in Europe. And it is widely thought now that the South German bents were mostly Colonial bentgrasses (*Agrostis tenuis*) with small amounts of creeping and velvet.

Until the mid 1950's, bentgrasses were established vegetatively from the C-series with varieties such as Cohansey, Washington, Congressional and the now infamous Toronto. Establishment by seed meant you planted either South German or Seaside. Then in 1955, Penncross, a seeded bentgrass (the standard by which all future varieties would be measured) was released by Dr. H. Burton Musser of Penn State University. Penncross is quick to establish and recover from injury due in part to its aggressive nature and extensive lateral growth. Penncross seed is produced from the random crossing of 3 vegetatively propagated strains in the field. The next 20 years would see the release of very few bentgrass cultivars, and not until 1978 did Dr. Joe Duich, also from Penn State, release the first serious competitor in Penneagle. Penneagle is considered less aggressive and more upright than Penncross. As several have written and Dr. Milt Englke said at the last EXPO, many of the management standards and equipment in use today were developed to maintain Penncross.

This year, as part of the 1993 National Turfgrass Evaluation Program (NTEP) we established 28 varieties of bentgrass at the O.J. Noer Facility, twenty-three of which are creeping bentgrass and about 18 that are commercially available. The trials are both at green height, on modified soil (80% sand 20% peat) and native (loamy) soil, and at fairway height. Simply, there has been more activity in the bentgrass development area in the last 7 years than there was in the previous 40 years combined. This might be a result of the limitations of Penncross, the explosion in golf course construction and renovation that has taken place in the last decade and the expanded use of bentgrass on tees and fairways.

DOMINATION

As a result of the widespread use and domination of Penncross, superintendents have been reluctant to utilize the new generation of bentgrasses. For many superintendents familiarity with the "Penn" prefix meant they would at least try Penneagle on fairways and then Pennlinks, by 1987, on greens. Additionally, the USGA has been

conservative in the recommendations regarding the use of varieties other than Penncross. I can understand this because as I mentioned earlier, an entire maintenance industry was built to grow Penncross.

If you are renovating greens and have several Penncross (or Penncross/*Poa annua*) surfaces, it will require some alteration of your management program on the newer greens to maintain a certain amount of consistency. Newer varieties, especially Pennlinks, were developed primarily for use on greens and, like annual bluegrass its major biological competitor, it has an upright growth habit, fine textured leaves and provides a superior putting surface. Still, the specification of bentgrass varieties for new construction includes vast amounts of Penncross and it is this scientist's opinion that this is no longer the best choice. In my travels across the country, I see more professionals making their way from Penncross through Pennlinks into the newer varieties.

A CLOSER LOOK

New varieties are developed to offer different options that include improved heat and wear tolerance, darker green color, finer leaf texture, upright or lateral growth, and various levels of disease resistance. Also, several varieties have been released just for use on greens such as Pennlinks and 18th Green developed in Canada. Here's a quick overview based on published reports and results of the 4 year (1990-1993) NTEP Trials.

The best performer in the NTEP Trials both green and fairway/tee was Providence. Providence was released from my alma mater the University of Rhode Island by Dr. C.R. Skogley. For decades Dr. Skogley preserved and cared for the oldest bentgrass plots in the country and always stressed the importance of having a variety that was a consistently high seed producer. Providence is one of, if not the darkest green varieties available, scoring very high in the genetic color ratings. Also, it is fine textured and has demonstrated dense, upright growth. It provided excellent quality in all the trials (fairway/tee and native and modified soil greens) and to date has scored well in our trials at the Noer Facility.

Another excellent performer in the NTEP trials was Putter, a selection from the state of Washington, performed in the top 10% of all trials with respect to quality and demonstrated exceptional seedling vigor with moderate levels of thatch. It has been promoted as a dark green selection with take-all patch resistance. However, results from the fairway/tee study did not reveal a significant difference between the creeping bentgrass varieties relative to take-all patch and Putter scored in the lower 50% on genetic color. Still, it performed better in the two green trials relative to color and overall quality, which begins to suggest site specificity for this variety.

MIDDLE OF THE PACK

Cobra, SR1020 and National all scored in the middle of the pack in the fairway/tee trial. However, we have found SR1020 to be more susceptible to dollar spot than other comparable varieties. Seed Research (the owners of SR1020 & Providence) may have recognized this fact early in development and introduced a blend of SR1020 and Providence sold as Dominant. SR1020 is the #1 selling grass in Australia and, with Providence, make-up the most widely used of the new bentgrasses. Currently, we are not recommending pure stands of SR1020 because of the limitations with dollar spot.

The "Penn" series performed from the middle of the pack with Penncross and Penneagle entering the top 5 best fairway/tee varieties for overall quality. Also, Pennlinks ended up in the middle of the pack on both greens trials. In general, these grasses are still reliable and remain valuable "stand-by" species, should other varieties not be available.

SLEEPERS

Several varieties that I would classify as having great potential are Regent for fairway/tee quality turf. This variety demonstrated exceptional density that did not translate into high thatch accumulation levels. Regent was the top variety in the modified soil(sand-based)green trial over the 5 year period. Other varieties worthy of further look are Viper and 18th Green. Both varieties are the darkest green and finest leaf texture in the trials which can provide both an aesthetic and functional benefit. One could speculate that excellent genetic color taken in concert with some demonstrated wear tolerance, could result in lower N rates for color without compromising wear tolerance. Interestingly, Viper did accumulate the highest thatch levels in the one location where it was measured.

SCHIZOPHRENIC VARIETY

An interesting trend appeared with Pro/Cup, a selection handled by Scotts. This variety was at the top of the fairway/tee list and native soil green trial with Providence. However, it was right in the middle of the pack on the modified (sand-based) green. It is a moderately aggressive, dark green selection with good brown patch resistance.

Pro/Cup demonstrates a point that I have attempted to imply throughout this discussion. With the availability of new varieties developed in a wide range of environments, we may now have specialist bentgrasses that are ideal in specific locations for specific needs.

SOUTHERN MAN

The increased demand for bentgrass playing surfaces in the southern United States, as far south as Miami, has prompted breeders to develop improved heat and drought tolerant bentgrasses. Currently, the two premier selections that dominated the 1994 market were Cato and Crenshaw, from our "Southern Man" Dr. Milt Engleke. The research conducted with these varieties is very impressive including data on rooting response to high temperature and species capacity to adjust to drought stress conditions. These varieties were not included in the last round of NTEP trials, but, were planted in the latest trial. I expect to have more to say about these varieties, as we learn if there are trade-offs in our cooler region for the improved heat tolerance. Stay tuned.

DECISIONS, DECISIONS...

One of the challenges of having more bentgrasses to choose from is how to decide which is best. One way is to read articles, like this where the habits of the grasses are discussed. A much better way is to review the results of the NTEP trial from 1990-1993 that was recently completed for fairway/tee and green (modified and native soil) situations. A still better way is to see them growing at the Noer Facility (which you are always welcome to visit) and then look at the NTEP results. However, the best way would be to plant some on your golf course. Set aside an area and plant a nursery, or maybe a new chipping green, or better still a new tee. Seed companies would be willing to send you small amounts of seed to establish small trials (if you need seed company info contact your local distributors or me). Conducting your own research will provide you with first hand experience not only with quality but also with management.