

Turfgrass Matters

Mid-Atlantic Association of Golf Course Superintendents

From the President...

Well it is May and I am trying to figure out why all those Poa plants that I thought were dead last year have thousands of very healthy seed heads growing on them. I guess that's just Spring in the Mid-Atlantic.

Thank you to all who were involved in hosting our April meeting. Jeff Wahl for having the golf course in great shape and Nick Vance for setting up the dinner and meeting at the Marriott. Also thanks to John Bergquist for speaking to us about the Pesticide Container Recycling Programs. I would like to take a second and thank all of you who attended, for calling and making reservations for the April meeting. Our counts are getting closer each month.

Our 1995 Superintendent-Pro Tournament hosted by Bob Miller and the Suburban Club was a great success. Please take a moment to thank Bob for putting together a great meeting.

To close this message I would like to thank those individuals who have already submitted articles for upcoming newsletters and encourage the rest of you to please write one. Our newsletter content will only be as educational and informative as you make it.



Golf Notes & April Results

Our thanks to Jeff Wahl and Nick Vance, as well as all the Staff at Falls Road Golf Course for a great time at our April Meeting. The hospitality was great, the golf course was in fine shape and the pin positions challenged us all. Thanks again Jeff and Nick for a job well done.

Winners of the points tournament were as follows:

Gross	Greg Rosenthal	32
	Sean Remington	31
	John Newcomb	28
	Jim McHenry	27
Net	Ed Cashman	+6
	George Renault	+6
	Dave Fairbanks	+5
	Lee Dieter	+5

Closest to the Pin

#5	Nick Vance
#11	Jeff Michel
#14	Ken Braun

Longest Drive

#18	Steve Cohoon
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I would like to add that Jeff Michel's closest to the pin was actually a HOLE IN ONE! Congratulations Jeff and thanks to our sponsors the day.

One final note, the Challenge Cup is scheduled for May 22 at Eisenhower Golf Course. Anyone who needs information, please contact me.

Jim McHenry

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USGA Regional Conference Woodholme Country Club

After the welcoming remarks, the USGA Regional Conference held at Woodholme Country Club began with Dr. Kimberly Erusha's review of Green Section history and the Environmental Research Program. The program, which began in 1990, has as its objectives: 1) to better identify the fate of pesticides; 2) alternatives to chemical use; and, 3) to better understand the relationship between chemicals and people as well as wildlife.

How turfgrass benefits the environment and the community was the topic discussed by Mr. Keith Happ, Agronomist for the Mid-Atlantic Region of the Green Section. The goal of the USGA is to provide facts to support the golf industry in dealing with this emotional issue. Mr. Happ provided some beneficial aspects of healthy turfgrass including: 1) the preservation of topsoil; 2)

erosion control by strong rooting; 3) filtration of urban runoff; 4) reclamation of previously unusable areas such as landfills; 5) production of oxygen and cooling of temperatures. He also wanted to stress the point that 70% of golf course acreage is non-play area requiring little or no pesticides and fertilizer. These areas, such as wetlands, habitat enhancement projects and environmentally sensitive acreage have also created a need to modify the rules of golf with respect to marking the course. There is a need to standardize these areas to avoid rules conflicts.

Mr. Happ's final comment was that all good news pertaining to golf and the environment be shared with others especially outside the golf community.

Dr. Erusha's second discussion of the session dealt with pesticide fact and the

effects of golf courses on people and wildlife. One aspect of concern is golfer contact with materials applied on the course. USGA research on dislodgeable residue, or how much product comes off the plant, shows that less than 1% could be detected on club grips, shoes or pants. This 1% could be reduced even further by irrigation. Another study, measuring pesticide fate due to volatilization range from 1 - 13% of material on the leaf surface being lost. This could be reduced by spraying when surface temperature and solar radiation are lower as in the evening or early morning.

Dr. Erusha also cited a study conducted by the Institute of Wildlife and Environmental Toxicology of Clemson University. This research done on Kiawah Island illustrated that the products Durshait and Turcam had very limited downward Movement in the native soil of this area.

Not all research on golf is performed by soil scientists and chemists. An interesting benefit of the game was found by the New Hampshire Institute of Health. It concluded that over a four month period, a person playing golf without a cart three times a week, lowered their cholesterol and actually lost 3 pounds. In the same period, without exercise, a person with similar habits without golf gained 3 and 1/2 pounds. Dr. Erusha's final comments reiterated what our profession has known for quite some time - that there are few negatives and a whole lot of positives about the game and the area it is played on. What other sport reduces your waist size and also supports wildlife habitat

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The Stimpmeter...AGAIN!

So, you think using a stimpmeter is easy. Roll a ball this way...roll a ball that way, do the math and you're done. Not so fast! (no pun intended) This approach might be okay on a flat green, but what's the best method when attempting to measure the speed on a sloping green? Simple, just use the following formula and you'll have your reading. The method for measuring a sloping green is:

- 1) Take 2 readings, 1 up the slope (Su) and one down the slope (Sd)
- 2) Apply the formula:

$$2 \times Su \times Sd / Su + Sd$$

If you are not satisfied with the speed, simply add one foot to your readings, ports the notice in some obscure club location (the on-course restroom is one suggested spot) and go about executing your important job responsibilities.

Lighting - What To Do, and What Not To Do - At Your Course

Clarke Fenimore, General Manager at the Quail Chase Golf Club in Louisville, Kentucky gave this presentation. His first-hand experience relates to a lighting incident at his Club. The major points he made were:

- 1) Each club needs to develop a written lighting/emergency plan. The plan must be understood by all key employees, so they know their role and can implement action when necessary.
- 2) Whatever warning system is in place at a club must be heard throughout the entire property. All golfers need to hear and hopefully heed the warning.
- 3) If a lighting incident does occur, the club must designate on spokesperson to deal with the media.

Ideas for Maintaining Environmentally Friendly Golf Courses

Stan Zontek gave this presentation. As he pointed out early in his discussion, IPM has taken on greater importance in the 90's. Another very critical area to understand and implement, is that of BMP's - Best Management Practices. These are simple, common sense approaches to our everyday tasks. Stan's best of the BMP's included:

- 1) Follow the label
- 2) Establish buffer zones along bodies of water
- 3) Use lower nitrogen rates around water
- 4) Use slow release nitrogen sources.
- 5) Use proper amounts of water when applying pesticides & fertilizers
- 6) Water in when necessary
- 7) Watch applications when heavy rains are forecasted.
- 8) Direct drainage from golf course locations to non-sensitive areas.

As you see from this list, this is not fancy stuff. Just simple precautions we should all be taking when working with fertilizers and plant protectant materials. For some, it may involve behavior modification. The same old approach won't work in today's world. It is incumbent on all of use to continually review our operations and see that we understand, use, and expand the list of BMP's.

Only with this approach can timely and correct information be presented.

- 4) A club should keep a daily log of play so they know who is on the course. The log also assists in accounting for everyone one the decision is made to clear the course.

- 5) Make all cart paths and service roads at least 9' wide. At this width, you can accommodate emergency vehicles.

As with many issues in today's world, documentation plays an important role, especially in a lighting strike!

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Planting Wetland or Native Areas

Planting wetland or native areas can be accomplished with some ease. That is not to say this work will be easy. Determining the parameters of the desired site to be planted is essential. Generally working on recently disturbed ground is more conducive to plant establishment. Although there can be good success in areas that possess cover.

Determining overall condition of the site is required. Some questions you may want to ask are as follows: Is it in full sun, shade, or a mix of both? Is it a upland of a wetland? Does it have poor, moderate, or good soils? What kind of existing vegetation does it have? And so on.

After determining the site condition; plant selection should be the next step. In most cases aggressive plant materials should be chosen. Aggressive plants being defined as those that will out compete existing, undesired plants, will reseed or spread by rhizomes readily and require as little maintenance as possible. If those characteristics are met there is little doubt these plants will accent the landscape, with or without color, and perform well.

With the site, it's conditions and plant species chosen there is one final step to

complete. Determining the stage of the plants maturity to be used. Again, planting on newly disturbed areas will quicken plant establishment. Therefore immature forms (i.e.: seed, bareroot, or smaller caliper) may be the better choice. In areas with existing cover more mature forms (i.e.: 2 inch or slightly larger potted plants or larger caliper) can be used. Usually planting herbaceous materials from 4 inch or larger pots is not cost effective for two reasons. The first reason being common sense. If the proper plant has been selected for the site it will, given time dominate. Secondly, nurseries usually do not grow the plants in similar soils or conditions as those at your site. Nurseries try to grow their materials in the best conditions possible. Therefore, plants coming from a good site and going to a less than good site will go through more stress than a typical transplant

from a good site to a good site. The reason being the roots are slower to push out into new, less desirable soils.

Lastly, one additional note. A plant selection may sound good in a book or on paper, but be sure it is available. More and more nurseries are producing wetland and native species, but some species are still difficult to locate.

Wetlands: A Never Ending Issue

Golf has become one of the most popular sports in the United States. The growing demand for playing surfaces outreaches the supply of golf courses. The golf course development industry is building golf courses on the average of 300 per year.

Along with the difficulties of golf course construction comes environmental awareness. There are so many environmental issues golf course architects, developers, and superintendents have to deal with. One of the more prevailing issues is wetlands.

Wetlands inhabit the transitional zone between permanently wet and generally dry

environments. They share characteristics of both environments, but can not be classified exclusively as either aquatic or terrestrial. Wetlands perform a wide range of functions that are necessary for supporting plant and animal life and for maintaining the quality of the environment. These functions include: flood control, shoreline stabilization, ground water recharge and discharge, and food chain support.

Classification of wetlands is plagued with controversy and problems. Not only is there enormous variety of wetland types and their

high dynamic character, but defining their boundaries with precision is difficult. There are no universally accepted or scientifically precise answers to their classification. Additionally, over time, some wetlands may evolve through various stages of natural succession to become dryland areas.

Therefore, a generally accepted standard for determining wetlands is needed. Until then, the optimum goal is coexistence with wetlands. We need to protect and manage to maintain sustainable benefits for human kind, wildlife, and environmental quality.

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Water Management - Don't Forget the Hose

by Rich Scheider

As an Agronomist, I am often asked by superintendents ... what is the biggest problem I see as I travel the Mid-Atlantic area? It really is a very simple question to answer, and that is, management of water on the greens.

There are many factors which contribute to the problem, most of which you all are aware: Soil type, percolation rates, irrigation equipment, localized dry spot, disease pressure and so on; however, there are several other factors that you may not think about that contribute to the problem, such as dependence on automatic systems, reliance on computers and the fact that today's superintendent is being pulled in too many directions at once (i.e., lack of time to think and plan).

If I were to single out one of the factors involved, it would be the reliance on automated systems to syringe greens. I cannot emphasize enough that timers, controllers, etc. need to be checked often to ensure that what you have programmed into the system time wise is what you are receiving from the head at each location. Even the most sophisticated system can end up watering too much on one spot and not enough in another. This happens as much today with sand greens as it does with old push up greens.

This leads to the most important point in my mind, and that is the need to continue to hand water. ; whether it be hot spots in sand greens or hand watering old greens to ensure that we do not over-water one area at the expense of another. During the past few years I have seen the major portion of a green become too wet while trying to syringe hot spots with overhead irrigation. Hand watering is as much an art as a science, and it is as much a part of the 90's as anything else we do on a golf course today. Providing for hand watering should be a part of every new golf course design.

Very often I am told, "I can not hand water, as I do not have enough crew." Well, when the greens are over wet in some areas, and too dry in others, maybe something else needs to be dropped from the program to free up people to hand water. I can not emphasize enough the importance of hand watering during critical times.

Today's irrigation systems are just great. A lot better than anything I have ever worked with; however, we need to pay strict attention to water management.

Always take a soil probe when you check the course.

Make sure your timers are set correctly.

Know how much water is coming out of your heads.

Periodically check the volume to make sure you are getting that you programmed.

When training a crew to hand water, make sure they understand how critical a procedure it is an check them often to make sure they are not dragging out the process in order to get out of another job on a hot day.

As you can see, I have strong feelings about water management, and in particular, the use of a hand-held hose. Every year I see situations that can be avoided.

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Impressions of Augusta National

By Chris Avers

Many of us sat glued to our television sets during the weekend telecasts of the recent Masters Golf Tournament, enjoying an annual tradition, taking in the beauty of the course, or rooting for a specific competitor. These are the reasons I usually watch the tournament, but this year I had added incentive. I was fortunate enough to visit the Augusta National Golf Club for the Monday-Tuesday practice rounds. I said fortunate because I was able to clear my calendar, had a place to stay, and did not have to worry about getting tickets. Augusta National is everything you hear and read about. I would like to share with you my impressions of one of the most beautiful golf courses in the world.

The immediate vicinity and the unkept bamboo / privet hedge surrounding the famed Augusta National Golf Club leaves the novice into thinking a terrible mistake has been made, but once you see the inaustrere main entrance and Magnolia Lane, you know that you are indeed in for a treat. Walking into Augusta, you leave the real world behind and enter into a make believe world where there is a golf course that is beyond description. If there is a more pristine or manicured golf course in the world, I would like to see it. The first thing that struck me was the grass, oh the grass! It was so green, so consistant, so short, and so fast! I was shocked at the lack of rough and lack of definition between playing surfaces. The fairways were mowed from treeline to treeline, there was no rough to speak of. Even the turf around fairway bunkers and the greens was fairway height. I could easily imagine putting on the fairways at Augusta.

I quickly realized that this golf course was a position course. You had to be in the correct position throughout the course in order to take advantage of monstrous rolls, approach angles to greens, and to be in position to go for the par 5's in two. The height of the turf and the undulating terrain meant a properly positioned tee shot would often result in a "short iron" to the green. The greens were severely sloped, multi-tiered, and as you could imagine, fast and hard. I also noticed that there were not as many bunkers as you might think from watching the event on television, but each and every one of the 45 bunkers comes into play. Watching some of the world's top professional golfers putting the ball off the green or leaving balls in the bunkers was comforting to witness.

In order for the course to look and play as it did, the maintenance operation was something I really wanted to see firsthand. I was impressed by the size, organization, up to date technologies (weather radar), and of course, the amount of equipment. Augusta's superintendent, Marsh Benson, and his large staff did a fabulous job of preparing the course for the tournament. Their attention to detail scares me personally. Along with the golf course; the practice facilities, the par 3 course, and the famous cabins are maintained with the same attention to detail that the golf course receives. I witnessed the lawn areas surrounding the "cabins" having "hotspots" hand-watered.

I was amazed at the level of organization for the entire event. All the bases were covered, down to the smallest detail. There was an army of teenagers, dressed in yellow coveralls, responsible for picking up trash and cigarette butts. All the food lines moved swiftly due to abundant amounts and efficient help. There was a wide selection of merchandise and again, an abundant amount. Both food and merchandise prices were very reasonable, considering the uniqueness and popularity of the event. The tournament apparatus, whether snack stands, merchandise tents, outhouses, spectator bleachers, or television towers all seemed to be a part of the everyday operation of the course. There was nothing temporary at Augusta. It appeared as though a tournament was played there everyday.

I have been to Augusta once, and am by no means an expert, but I would like to

offer these suggestions. First, all class A superintendents who have an opportunity to visit Augusta should do so. Take advantage of the complimentary daily pass your classification entitles you to. Second, visit during the practice rounds because you will have a better opportunity to see the course in its entirety. The Masters no longer sells daily practice round tickets to the public, therefore, the practice rounds are less crowded than in years past. Please note, the practice rounds at the Masters are considerably more crowded than the average tournament stop. Lastly, walk the entire course early in the week. Take in the entire layout, the azaleas and dogwoods in full bloom, and get a feel for the terrain. You will better appreciate the Masters the next time you watch it on television. I did.

News & Notes of the Mid Atlantic

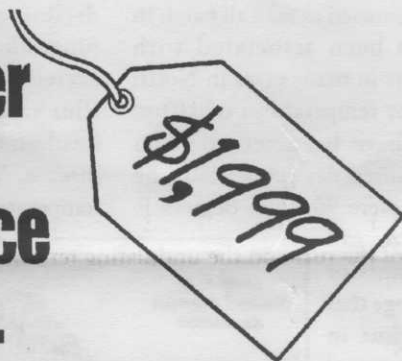
Congratulations to Kevin Prysieski, CGCS of Cattail Creek C.C. and Greg Rosenthal of Little Bennett Golf Course for being awarded a GCSAA Environmental Steward Award.

Belated congratulations to Pat Holt CGCS of Hunt Valley G.C., winner of the prestigious Leo Feser Editorial Award for his article, "Team-building Fosters Success", which appeared in the May issue of GCM.

Mark Stoddard, Superintendent at TPC Avenel, is looking for volunteers to work at this year's Kemper Open from June 5-11. If any superintendents have an assistant or valuable employee interested in helping out, please contact Mark at (301) 469-3728.

Both Bill Neus CGCS at Hobbits Glen G.C. and Ryland Chapman at Fairway Hills G.C. are working out of brand new maintenance facilities. - congratulations Bill.

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Reroutings

Michael Augustin, formerly at Indian Springs C.C. is the new assistant superintendent at Bethesda C.C.

Steven Nash CGCS, formerly at International Town & C.C. is now the manager, Grounds Services at Gallaudet University.

Mark Ross formerly at Chestnut Ridge C.C. is now working with Gary Harshman at Bay Hills G.C. as an assistant.

New Members

Please welcome the following members

Class B

Steve Keith Roberts - Marlboro Country Club
Thomas Tuttle - River Downs Golfers Club

Class D

Robert Mullings - Marlboro Country Club
Mostrom Tucker - Lakewood Country Club
Dino Psaroudis - Lakewood Country Club

Class F

Peter Li - Earth Resources Technology, Inc.
Walter Wiley - WaterWorld, Inc.
Donald Klein - Terra International
Chip Presendofer - Tee & Green Sod

Update on Management of Summer Decline of Bentgrass

Leon T. Lucas
N.C. State University

Turf quality on bentgrass golf greens often declines in hot weather during the summer especially in areas with high relative humidity. Many factors such as diseases, environmental stresses, soil properties and heavy traffic have been associated with this problem. High air and soil temperatures appear to be major factors in the southeastern United States. Soil temperatures above 90 degrees F two inches deep in the soil are often recorded in the afternoon on bentgrass golf greens on clear and sunny days when the air temperature is above 90 degrees. The high temperatures cause the roots of cool season grasses to decline and the growth of new roots is inhibited. Published data indicates that bentgrass roots do not grow when the soil temperature is above 77 degrees F. The declining roots are more susceptible to root rotting fungi and other stresses and new roots do not grow in hot weather to replace the old roots.

The roots on individual bentgrass plants that are separated from a turf with decline are few in number and short. A typical bentgrass plant in the summer in North Carolina will have one or two small live roots from 1/4 to 1 inch long attached to a short live stolon. Most of the older and longer roots are dead and are attached to rotted and dead portions of stolons. Rotting of stolons may be as important as the root decline in the summer decline syndrome since the new roots develop on the youngest part of the stolons and as the stolons die the roots die. The small plants are very susceptible to any type of disease or environmental stress and as some plants die the turf becomes thin and the turf quality declines.

Other factors that have been observed to contribute to the decline are lack of oxygen in wet soils or in thatch layers, restricted air movement that prevents cooling and drying, localized dry spots, high soluble salts, wilt and diseases. Wet and poorly drained soils have low levels of oxygen which cause roots to drown and provide favorable conditions

for disease causing fungi. Too much water around the plants can occur on high-sand content greens where thatch layers develop on the surface and cause perched water tables around the stolons and roots. Roots can die quickly when soil temperatures are in the 90's and adequate oxygen is not present. Decline usually appears first on greens in low areas surrounded by trees or mounds. Canopy temperatures and humidity are usually higher on these greens than on nearby healthy greens in open spaces with good air movement. Wind blowing on the grass removes boundary layers and provides conditions for maximum evapotranspiration to keep the grass cooler and drier. Decline in patches that has been diagnosed as take all patch in some cases has been associated with localized dry spots in many cases in North Carolina. Canopy temperatures of 110 to 113 degrees F have been recorded on bentgrass in localized dry spots when the air temperatures were 90 to 95 degrees F.

These temperatures can kill bentgrass plants or cause severe damage that appears as a decline in the spots for several weeks later. High soluble salts in the top 1/2 inch of soil and thatch have been detected on some greens that are developing summer decline. The high soluble salts may be from fertilizers, especially ones with high amounts of potassium, or from irrigation water with high salt content. The high salts usually occur during dry weather when adequate irrigation water has not been applied to replace water removed by the plants and by evapotranspiration. Excessive levels of salt can damage the roots and stolons and make these tissues more susceptible to fungi discussed below.

Root and stolon rot diseases have been identified as major factors in the summer decline of bentgrass. Many different fungi have been isolated from roots with the summer decline syndrome. Pythium species have been isolated most frequently in samples processed in our laboratory. A total of 33 different species of Pythium have been isolated and identified by Dr. Gloria Abad from roots and stolons of bentgrass with decline from golf greens. Typical brown patch is often observed on these greens early in the summer and some of the declining patches in late summer appear to be similar in size and in the same places as brown patch was earlier. Three different species of Rhizoctonia that causes brown patch have been isolated from bentgrass golf greens. The Rhizoctonia species may be causing much of the stolon rot that is observed on declining bentgrass. The most effective fungicide treatments discussed later have activity against both Pythium and Rhizoctonia species and would indicate the involvement of both of these fungi in the disease. Wilt which occurs during high temperatures on the bentgrass plants with

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poor root and stolon systems is probably the final factor that kills most of the plants.

Management practices that encourage new root growth during stress conditions appear to help manage the summer decline problem. Aerification in the spring and early summer to allow better drainage through thatch layers and more oxygen in the soil is probably the best practice to use to help prevent the problem. Removal of trees or undergrowth from around greens to improve air movement has helped in some cases. Fans installed around greens have been very useful to help improve growing conditions in areas without good air movement. Fans should be directed downward to move air across the surface of the green and toward open areas for best efficiency. Irrigation programs should be modified throughout the summer to apply small amounts of water frequently when root systems are short to prevent drought stress. Wilt symptoms should not be allowed to develop during the summer because the bentgrass cannot recover from wilt when the plants are weak. The application of small amounts of fertilizer (1/10lb. of N/1000 sq. ft.) with a sprayer every 10 to 14 days during the summer has helped to avoid soluble salts problems and to insure adequate nutrients near the soil surface where the new short roots are growing. Fertilizers applied earlier in the year may be deeper in the soil and not available to the new short live roots. Some new bentgrass growth must continue during the hot weather to provide good turf quality.

Some fungicide applications have given good results on the summer decline syndrome in test plots at North Carolina State University. The combination of Aliette plus Fore or Aliette plus Daconil 2787 applied every 14 days beginning in early summer, about June 13, have been the best treatments for improved turf quality in test plots at Raleigh. These fungicide combinations have been shown to be active against both *Rhizoctonia* and *Pythium* species that have been associated with the summer decline of bentgrass in North



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Carolina. Results with low levels of Aliette plus Fore have indicated a synergistic interaction between these fungicides for the control of brown patch. Tests on bentgrass in 1994 indicated that the Fore formulation gave better brown patch control and better turf quality than other types of mancozeb fungicide formulations.

More research is planned to identify more factors and diseases that may be involved in the development of the summer decline

syndrome and to develop better management methods. Knowing that the roots and stolons of bentgrass decline during the summer will help golf course superintendents adjust management practices to avoid serious damage to golf greens. Management practices that encourage new root growth and proper fungicide applications at the correct time are the most effective ways that we now know to help manage this serious problem on bentgrass in hot and humid climates.

Bentgrasses: Past, Present and Future

by Skip Lynch
National Technical Representative
Seed Research of Oregon

Not long ago, the golf course superintendent had very few choices of creeping bentgrasses for new green construction or overseeding of existing putting greens. Since 1987, the choices seem to have grown exponentially. Because of the introduction of so many new bentgrasses, knowing which bents do what, where and for whom is getting to be a full time job in itself.

So how is a superintendent to keep up with the barrage of new varieties entering the bentgrass market? Study, study, study. Perhaps the next few paragraphs will provide you with a brief guide to the bentgrass market's past present, and possible future.

The Past

As golf was emerging on the North American continent, the only bentgrass seed for greens available to the market was the South German Bentgrass. This was little more than a collection of *Agrostis* sp. seed from southern Germany that was cleaned and resold.

The purchaser of this seed was likely to get a wide range of plant materials from creeping to colonials, highlands to redtops, to velvet bentgrasses.

The first improvements to bentgrass putting greens took off in two directions: vegetative selections and improved seeded varieties. After 1920, several vegetative varieties became available to the market. Among those were Toronto, Cohansey, Washington and Pennpar. Although these varieties were fairly uniform, regional adaptation and the lack of genetic diversity limited their long term success.

The first improved, seeded variety of creeping bentgrass in the U.S. was "Seaside" in 1923. This was significant to the market because Seaside was more uniform than the South German seed sources. Also, an improved seeded variety was significant because the seed could be shipped and stored more easily than vegetatively propagated varieties. By modern standards, little or no advancement in disease resistances, color uniformity, or wear tolerance was bred into this variety.

The next (and undoubtedly) significant development in the U.S. creeping bentgrass

market came with the release of Penncross in 1954 from Penn State University. Penncross was something of a hybrid of the two production philosophies. In order to maintain the uniformity of the variety, three genetically different plant materials were vegetatively planted in the production field, grown to seed, and harvested.

This production process brought to the market a relatively uniform variety. Penncross would only segregate in to 3 different colors, textures and growth habits. It was coarse, aggressive and susceptible to nearly every disease of putting green turf. However, Penncross's adaptability, persistence, popularity and impact on the market allowed it to become the industry standard until the late 1980's.

The Penn State breeding program, realizing that Penncross tended to be too thatchy for fairway use, bred and released 'Penneagle primarily for fairway use in 1978. This was significant because it marked the first time that a variety had been developed for a specific use. Although Penneagle has been used on putting surfaces, it is best suited to fairway use.

The Present

At the end of the 1960's, several university breeding programs were working hard to improve creeping bentgrasses in North America. Researchers were making improvements in disease resistance, darker color, finer texture, reduced thatch accumulation and greater traffic tolerance.

In 1986, the floodgates opened to several new varieties. Among the most significant entries to the market were 'SR 1020', 'Providence' (SR 1019), and Pennlinks. Each was developed for a specific purpose, and have lead the way for further generations of bentgrass variety development.

SR 1020 - Developed by Dr. William Kneebone at the University of Arizona. SR 1020 was nearly 20 years in the making. Dr. Kneebone collected and evaluated bentgrass germplasm from across the southern tier of the U.S., looking for a putting green variety that would be extremely heat, drought and wear tolerant. SR 1020 was bred to be

very fine textured and upright to reduce the need for mechanical grooming and increased putting speeds at higher mowing heights. Furthermore, Dr. Kneebone's breeding and evaluation process produced an extremely uniform 5-clone synthetic variety. By the selection of five very dark green and texturally similar clones, SR 1020 has almost no segregation, unlike its seeded predecessors.

Although it was released in 1986 as the first creeping bentgrass developed specifically for the southern U.S., over the past eight years SR 1020 has proven that its range of adaptation is not so limited. SR 1020 has been a top performer in the far south from Georgia to Texas to Arizona to California. It has also been very successfully managed well north of the Mason-Dixon line, and continues to perform well throughout the Midwest and Great Plains states.

PROVIDENCE (SR 1019) - Providence creeping bentgrass was developed at the University of Rhode Island by Dr. Richard Skogley. Like Dr. Kneebone with the University of Arizona breeding program, Dr. Skogley spent nearly 20 year's collecting bentgrasses from Old South German greens throughout the Northeast. The result of Dr. Skogley's hard work and patience has been one of the market's most uniform, dark green and upright varieties to date. Because of its extensive evaluation under a wide variety of disease pressures, Providence has shown extremely good resistance to all major turfgrass diseases. In addition, Providence's fine texture and upright growth has made it a very fast putting surface that is very resistant to spiking.

Over the last three years, the 5-clone synthetic Providence has been the #1 creeping bentgrass in all three NTEP bentgrass trials (Modified Green, Native Soil Green, and Fairway/Tee).

PENNLINKS - Just as Penneagle had been developed to replace Penncross for fairway use, so too was Pennlinks developed to surpass Penncross's performance on greens. Pennlinks was developed by Dr. Joe Duich at Penn State University and released in

1986. Pennlinks has produced very good putting surfaces under a wide variety of growing conditions. Although it is more upright and uniform than Penncross, Pennlinks is not quite as fine textured, upright, dark green and uniform as other varieties available on the market.

PUTTER - Developed at Washington State University by Drs. Stan Braun and Roy Goss, Putter is a 2 clone synthetic developed primarily for Take-All Patch resistance. Putter is one of the darker varieties on the market with a fairly fine leaf texture. Putter had done well at putting green height, and has shown good heat tolerance in transitional climates.

COBRA - Cobra was developed at the New Jersey Agricultural Experiment Station by Dr. Ralph Engle. It is a 7-clone synthetic with very good leaf spot resistance and a less thatchy growth habit. The latter has made Cobra a good fairway grass. Cobra has been highly rated in California and Texas NTEP sites.

CRENSHAW (Syn 3-88) - Developed by Dr. Milt Engelke of Texas A&M and Dr. Virginia Lehman of Lofts Seed Company, Crenshaw is a 6-clone synthetic developed out of many of the same materials that brought SR 1020 to the market (in fact 3 of the 6 clones are believed to be in common with SR 1020).

Developed in the 1980's on heat benches at the Texas Agricultural Station in Dallas, Crenshaw was bred to have excellent heat and drought resistance. It is fairly finely textured, aggressive and dark green. Crenshaw seems to perform best in climates with prolonged heat and drought seasons.

Crenshaw was not entered into the 1989 NTEP National Bentgrass Test. Until the results from the 1994 plantings are published, there is no NTEP data for either Crenshaw or its sister, Cato.

CATO - Like its sister, Crenshaw, Cato was developed by Drs. Eugelke and Lehman at the Texas Agriculture Experimental Station in Dallas. Cato produces a fairly fine textured, dark green turf, while exhibiting more Dollar Spot resistance than Crenshaw.

SOUTHSHORE - Dr. Reed Funk at Rutgers University and Dr. Richard Hurley of Lofts Seed Company developed Southshore after collecting hundreds of plant materials from the Mid-Atlantic states.

Palmer, Nicklaus Outings Lead Auction Items

Far Hills, NJ—A round of golf for four at Bay Hill Club and Lodge in Orlando, Fla. with Arnold Palmer, and golf and dinner with Jack Nicklaus, headline the 15 live auction items to be offered on June 13 at the "Auction of the Century"; in New York City, to commemorate the United States Golf Association's 100th anniversary.

Golf Magazine, in cooperation with the USGA and Christie's Auction House, will hold a black-tie dinner and auction in The Grand Ballroom of the Waldorf-Astoria Hotel. A collection of one-of-a-kind golf treasures and fantasy experiences has been assembled for this evening with one hundred percent of the proceeds designated to various charities selected by the donors.

The Bay Hill outing includes transportation to and from Florida, a tour of the Golf Channel studios and a live on-air appearance. Nicklaus has donated his time for golf and dinner (for up to eight people) followed or preceded by seven days of golf at Nicklaus courses around the United States, all-expenses paid.

Other live auction items confirmed at this time include a VIP golf ticket package (four tickets apiece to the 1995 Ryder Cup matches, 1996 Masters, 1996 U.S. Open (Shinnecock Hills) or 1996 U.S. Open (Oakland Hills), 1995 British Open (St. Andrews) or 1996 British Open (Royal Lytham) and the 1995 PGA Championship (Riviera) or 1996 PGA Championship (Valhalla). Also offered is a framed tableau of 49 signed final-round scorecards (reproductions with original signatures) from U.S. Open champions.

Christopher Burge, chairman of Christie's, will conduct the live auction. A silent auction

of golf art and memorabilia will take place during a cocktail reception. Proceeds will benefit the USGA Foundation.

Updated lists of auction items will appear in Golf Magazine, Golf Journal and Met Golfer throughout the next few months. Item and ticket information are available by calling 1-800-393-USGA.

Southshore's 200+ clones exhibit a medium green, medium textured growth with improved Brown Patch resistance. Although test plots of Southshore have been planted along side the NTEP bentgrass trials at Rutgers, Southshore was not entered in the 1989 NTEP National Bentgrass Test.

The Future

No longer does the golf course superintendent need to settle for just one choice of bentgrass. It appears that there will be many more new varieties released over the next several years. Many of these varieties will need to be looked at very carefully to determine their range of adaptation, disease tolerance, management requirements, and their durability under play.

Not all of these new varieties have been entered into the NTEP's. Great caution should be taken when reviewing non-NTEP research data. With more and more varieties appearing in the marketplace each year, first hand knowledge may be the best way to select your next creeping bentgrass.

The challenges facing the seed industry, are similar to those facing the superintendent. We are working to provide creeping bentgrasses that require less mechanical management, fewer irrigation, pesticide and fertilizer inputs, while providing excellent playing surfaces. Our work has only just begun.

A Newsletter Change

You may notice that your newsletter does not always arrive prior to a monthly meeting. When it doesn't there has been a meeting notice flyer sent.

Often the newsletter may be ready but the meeting cost or times have not be finalized; or the newsletter isn't ready in time to meet a printing deadline required to mail in time for the meeting.

To get away from the editing crunch associated with meeting quick deadlines prior to a meeting we are working to provide meeting information in both the newsletter and through flyers. Look for the same number of newsletters (10 each year), but there will be flyers sent out at various times to help with the meeting coordination. This will assist in allowing for a better quality newsletter.

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