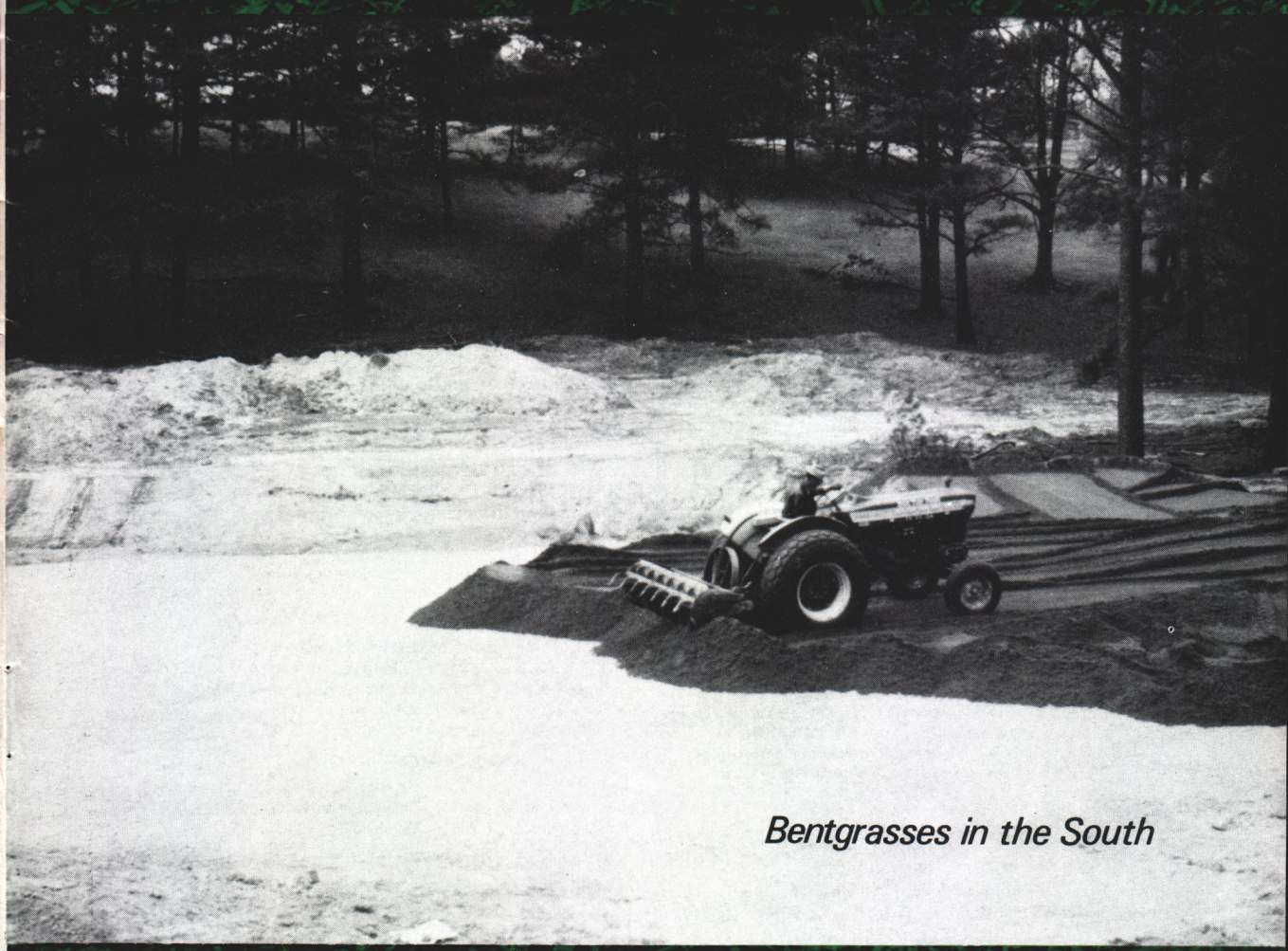
NOVEMBER 1974

USGA GREEN SECTION RECORD

A Publication on Turf Management
by the United States Golf Association



Bentgrasses in the South

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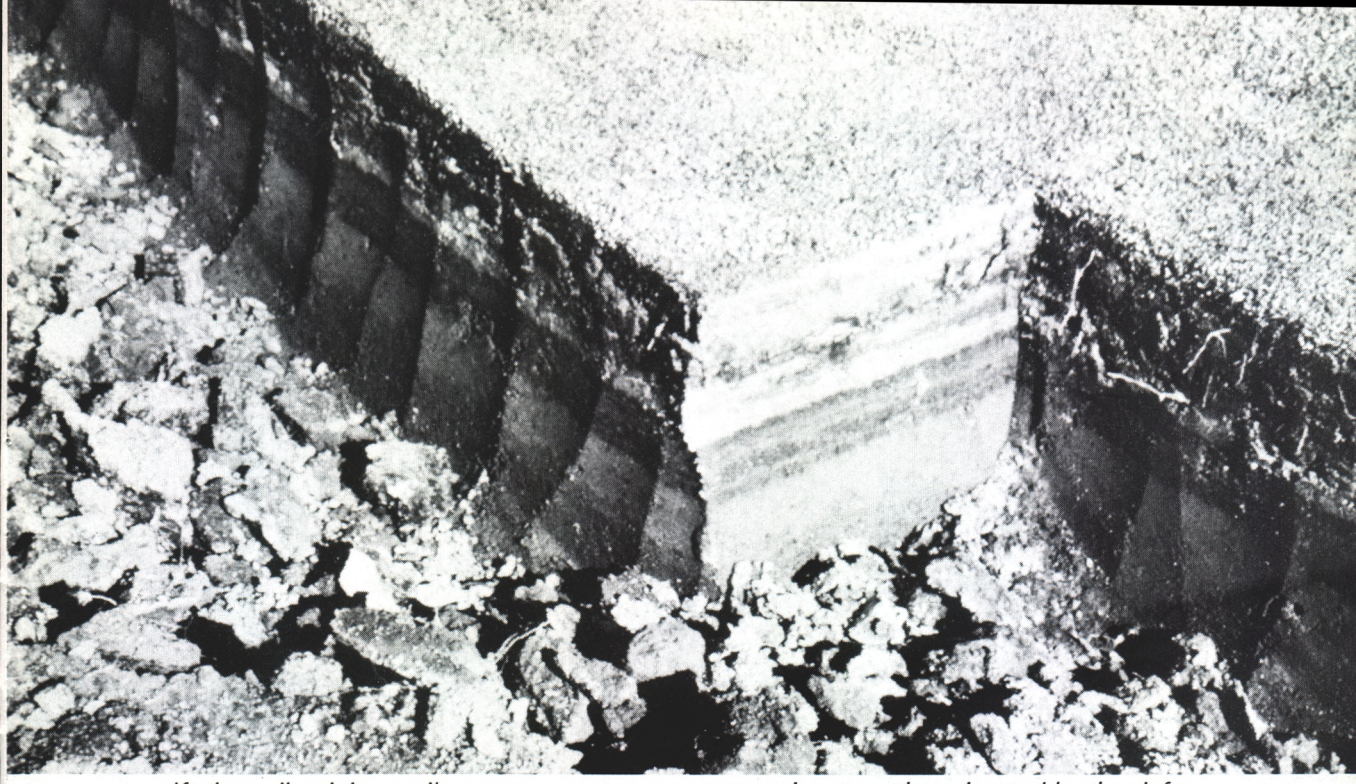


If the soil mixing, soil components or management is poor, there is trouble ahead for bentgrasses.

Bentgrasses in the Land of Dixie

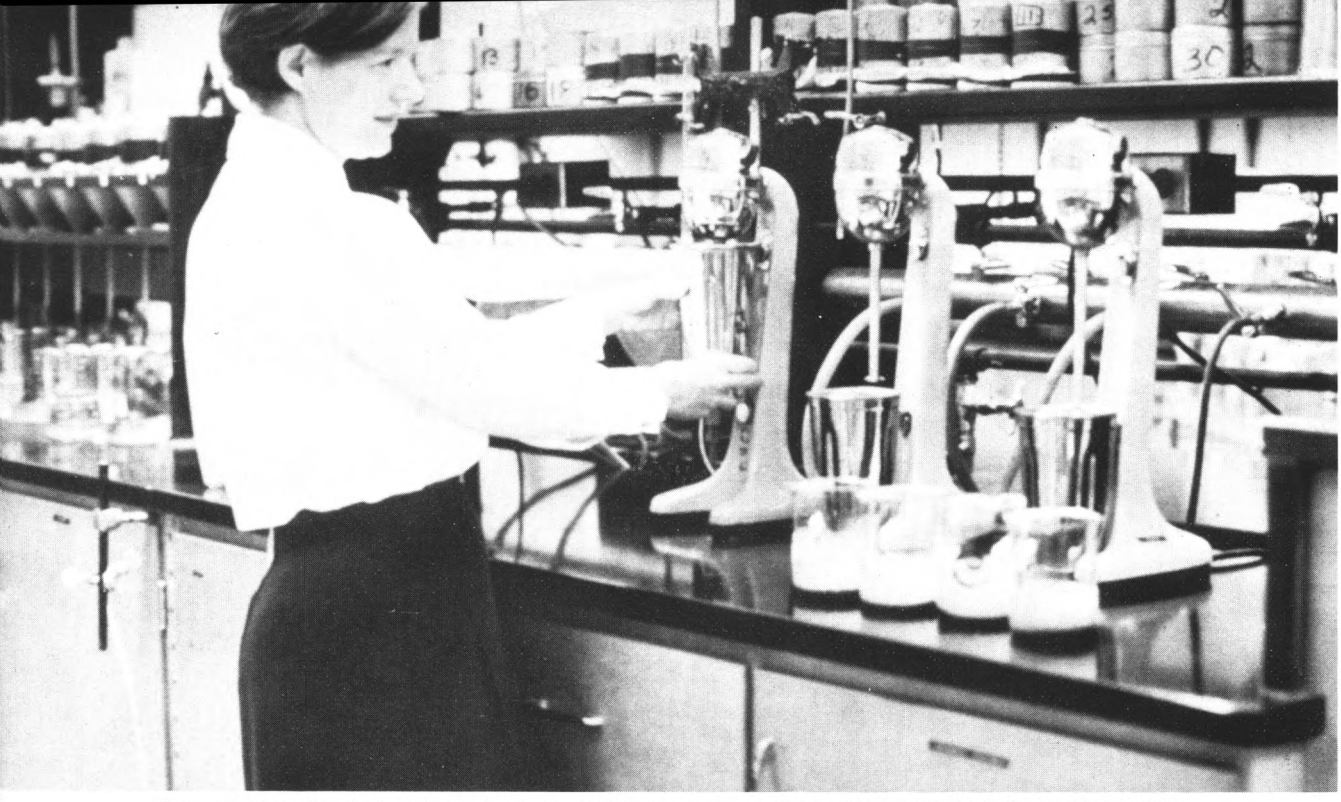
by **JAMES B. MONCRIEF,** Southern Director USGA Green Section

Research on turfgrass extends further back than most people realize. Settlers along the East Coast used both native grasses as well as those brought from Europe for grazing their cattle. Bluegrass is mentioned in writings before 1800, but the first monograph on grasses and sedges was published in 1870 in Pennsylvania.

George Washington and Thomas Jefferson did research on many crops, including meadow fescue, bluegrass, and probably some bentgrasses. In 1784, John A. Binns, of Loudoun County, Va., began experiments using gypsum on various crops, including bluegrass. It was not until the late 1890s, however, that the Connecticut Agriculture Experiment Station, under the direction of Alcott, showed interest in collecting turfgrasses. In 1906, the first mention of bentgrass turf plots in the United States was made under the direction of Dr. W.S. Harbin, of Long Island, when he went to the United States Department of Agriculture for technical assistance in solving problems on greens at his golf course. This was when he met Dr. Charles V. Piper and Dr. Russell A. Oakley. The Agriculture Experiment station at Rhode Island also developed turfgrass plots early in the century.

Some 20 years later, according to the records of the USGA Green Section, $900 was given to the University of Florida under the direction of Dr. Charles R. Enlow. He observed both warm and cool season grasses, including red top, various ryegrasses, annual bluegrass and seaside bentgrass. About the same time, Dr. Howard B. Sprague of the New Jersey Experiment Station, with the assistance of Dr. Piper, laid out the first bentgrass plots, including Metropolitan and Virginia varieties. The USGA Green Section contributed $600 a year to conduct the experiments with the remaining costs taken up by the New Jersey State Agriculture Experiment Station. The bentgrasses tested were *Agrostis palustris, Agrostis tenuis,* and *Agrostis canina.*

Following World War I, Lima Carrier, chief agronomist at the Virginia Polytechnic Institute, went to the Pacific Northwest to raise bentgrasses. The first turf garden at Arlington



One of the physical soil analysis tests being performed at the Mississippi State University laboratory supported by the USGA Green Section.

Farms, in Virginia, was started in 1921, sown with Colonial bentgrasses. The chief creeping bentgrass varieties of the day were Washington and metropolitan, and from these the Green Section began to establish demonstration gardens. Other bentgrasses in use at the time were south German, a mixed bent containing a large percentage of Rhode Island or colonial bent, a fair percentage of velvet bent, creeping bent and some red top. Rhode Island bent and colonial bent are quite similar. Velvet bent is the finest textured bentgrass of all and is creeping in habit. The forerunners of today's bentgrasses were from many strains of creeping bent and the better adapted, hardier types were established with stolons rather than seed.

The first selected bentgrass plots (metropolitan, C-51) were established at the Country Club of Virginia at both its Richmond course and its James River course. The golf course superintendents decided that bentgrass should not be fertilized in the summer, and it should be maintained at a higher cut. Greenbriar Country Club, Hot Springs, W.Va., had its first creeping bentgrass, known as the Ekwanok strain, in 1924. In 1926, however, 15 greens were planted with Metropolitan.

Some demonstration plots at the Bay Shore Golf Course, Miami Beach, Fla., were established with south German bentgrass seed in 1931 and made their best growth from October through May. The same year, demonstration gardens of bentgrasses were established in Tulsa, Okla., and Greensboro, N.C.

As early as 1929, double greens of bermudagrass in the summer and cool season grasses in the fall were being used in the Atlanta, Ga., area. In reviewing old Green Section *Bulletins*, we note one paragraph asking, "One of our bent greens is almost completely overrun with clover. What can we do to get rid of it?" The answer was, "Heavy spring fertilizing gets the grass off to a good start."

The first domestic commercial bentgrass seed came from mixed strands harvested in southwestern Oregon. Most of it was seaside with some Astoria or colonial-types. Seed production increased considerably through 1936, and then it became stationary. Until 1934, seed production was from natural stands but these began to deteriorate and contained considerable weak seed. The growers then began to improve production and strive for better seed quality. Old timers will recall coose bentgrass which came from Coos County, Oregon.

In the early 1930s the Green Section began to collect selections of bentgrasses which had survived abnormal weather conditions and a

Some of the survivors of the high temperature bentgrass studies at Arizona. Soil and air temperature at the time of the picture was 115° F.

wide variety of soils. Many golf course superintendents from throughout the country cooperated by sending in material. Creeping bentgrass selections were given the prefix C and velvet selections the prefix V. The velvet bentgrasses were not adapted to warm climatic conditions and were soon eliminated.

At the Arlington, Turf Gardens, the first plots of selected bentgrass varieties were planted in 1937. Incidentally, the Pentagon now stands on the site of the original Arlington Turf Gardens. The bentgrass plots were later transferred to Beltsville, Md. Selections of the best varieties were made and shipped to various clubs throughout the country. They were planted in pie-shaped experimental greens and were observed for putting quality as well as survival under adverse growing conditions. Some of the selections were sent to Atlanta, and Chattanooga, Tenn. At that time, Dr. John Monteith was in charge of the Green Section and he came to Atlanta and worked with the father of Harold Sargent, who is now the golf professional at Atlanta Athletic Club.

The first courses in Tennessee to have bentgrass greens were Chattanooga Golf and Country Club and Holston Hills Country Club, in Knoxville. This does not include golf courses in the higher elevations of eastern Tennessee where Highland and Astoria bents were the main grasses used until *Poa annua* became dominant.

Considerable progress was made in the 1940s in establishing bentgrasses across the South. In checking with people informed of this era, some interesting facts about establishing bentgrass in the South were revealed. Dr. Roy A. Bair had numerous warm and cool season grasses at the Everglades Experiment Station in Florida. Many of the bentgrasses were furnished by the USGA Green Section under the direction of Dr. Fred A. Grau. The grasses were observed for use in lawns, recreational areas, airports and roadsides. There were also turfgrass trials established at Indian Creek Country Club, Miami Beach, Fla., in 1947-48. Several dozen of the most promising bentgrasses were shipped to Florida, but only C-3 and C-5 survived. They were eventually taken over by bermudagrass. Indian Creek Country Club also seeded with Astoria and Highland bent but they were lost within a year or two.

The history of bentgrasses in the South would not be complete without a summary of Superintendent Charlie Danner's efforts in adapting bent to the South. Charlie started in golf in Virginia when he was a young man, and he moved to Richland Country Club, in Nashville. In 1950 he started a nursery of Arlington (C-1) and Congressional (C-19) bentgrasses. He planted one or two greens a year and gradually developed 18 greens with this bentgrass mixture. In spite of poor soils and poor surface drainage, he maintained the grasses successfully for many years at Richland Country Club before moving to the Capital City Club, in Atlanta, in 1961.

C-1 and C-19 were established at many other

courses in Tennessee, including Belle Meade Country Club and Hillwood Country Club, following Charlie Danner's success at Richland. Many clubs in the area have now changed from bermudagrass to bentgrass greens.

Bentgrass was used in the Atlanta area with some success and became very popular about 1956-59 when George Barnhardt established the greens at Cherokee Town and Country Club. Penncross is now the most popular of the seeded bents. Initially, Seaside bentgrass was used across the South including the Oklahoma-Texas area many years before Penncross or vegetative bentgrasses were used.

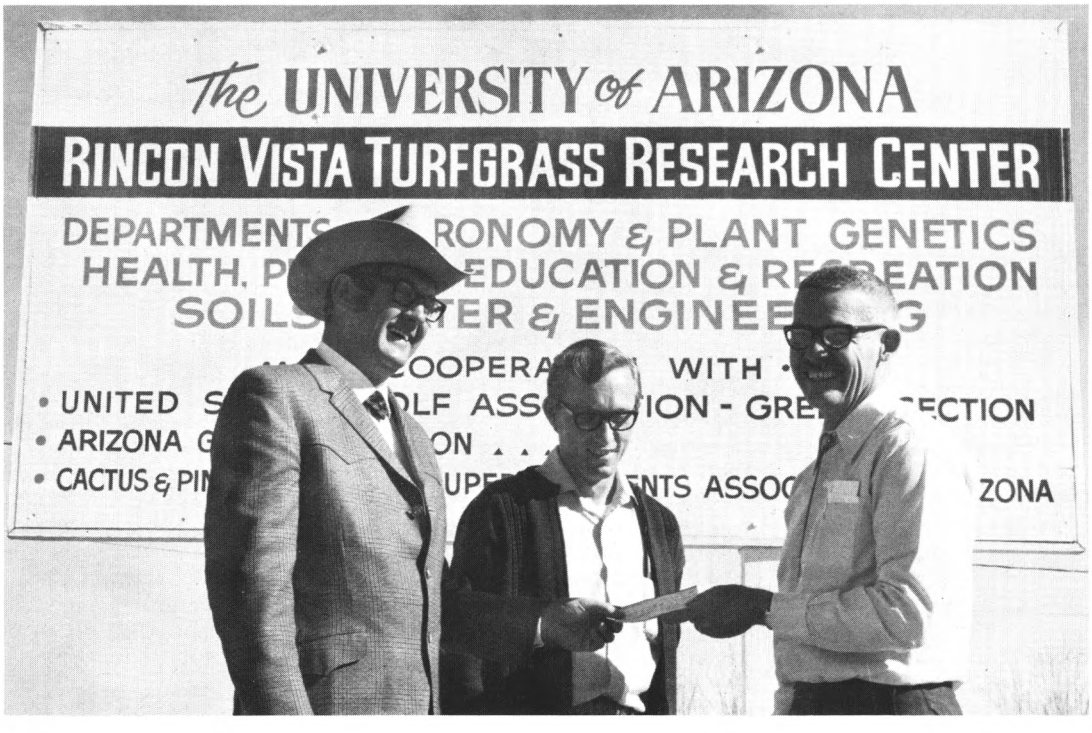
As improved strains of bentgrasses are developed by researchers and improved techniques come into wider use, more bent will be used in the South. There are now bentgrass greens from Myrtle Beach, S.C., across the South to the West Coast. Attempts are still being made to grow it in Florida. At one research center, a short summer vacation by key personnel resulted in the loss of the bent research plots as well as a three-year old Penncross green. Green construction techniques will have to be followed more closely than they have been if losses are to be reduced.

Selections of heat-tolerant bentgrasses are being made by researchers and should become more widely used in the next five to 10 years. There are several selections that seem promising, including two from Bartlesville, and Muskogee, Okla., selected by Dr. Wayne Huffine.

More clubs are beginning to establish bentgrass greens in areas where they would not have thought of using it 20 years ago. In the past, the lack of satisfactory soils, correct mixing and sound construction methods were not emphasized as much as they are today. For the past five to seven years, golf courses have been built so rapidly that emphasis has not been placed on proper green construction. Because of faulty construction, bentgrass greens have been lost after the first year with members being unhappy and inconvenienced. Any club that is going to renovate greens should first seek out available information regarding proper construction. This includes a physical soil analysis of the component parts of the soil media.

With more sand being used in construction of greens, there is much more leeway in dates for planting grass either with seed or by vegetation. Bentgrass can be planted throughout the year by hydro mulching if the superintendent is aware of the limitations of bentgrass. Normally, the best time to plant bentgrass is in early September or the early spring.

High temperature bentgrass studies are underway at the University of Arizona. They are supported by the USGA Green Section. Supt. Bob Sanders, Drs. G.V. Johnson and W.R. Kneebone (left to right) discuss the project.



Penncross bent seeded at ¾ to 1¼ pounds per 1,000 square feet has been quite satisfactory. Those greens being converted from bermudagrass to bentgrass by using Tupersan should be seeded at a higher rate of two to three pounds per 1,000 square feet to minimize transition.

As soon as bentgrass begins to grow, mow it at 3/8-inch for maximum root development, and gradually lower to the height desired by the club. Bentgrass is usually mowed from 1/8- to 5/16-inch.

Probably nine or more pounds of nitrogen per 1,000 square feet will be needed for one or two years where greens are built with high infiltration rates. Those built with more silt and clay will require less nitrogen.

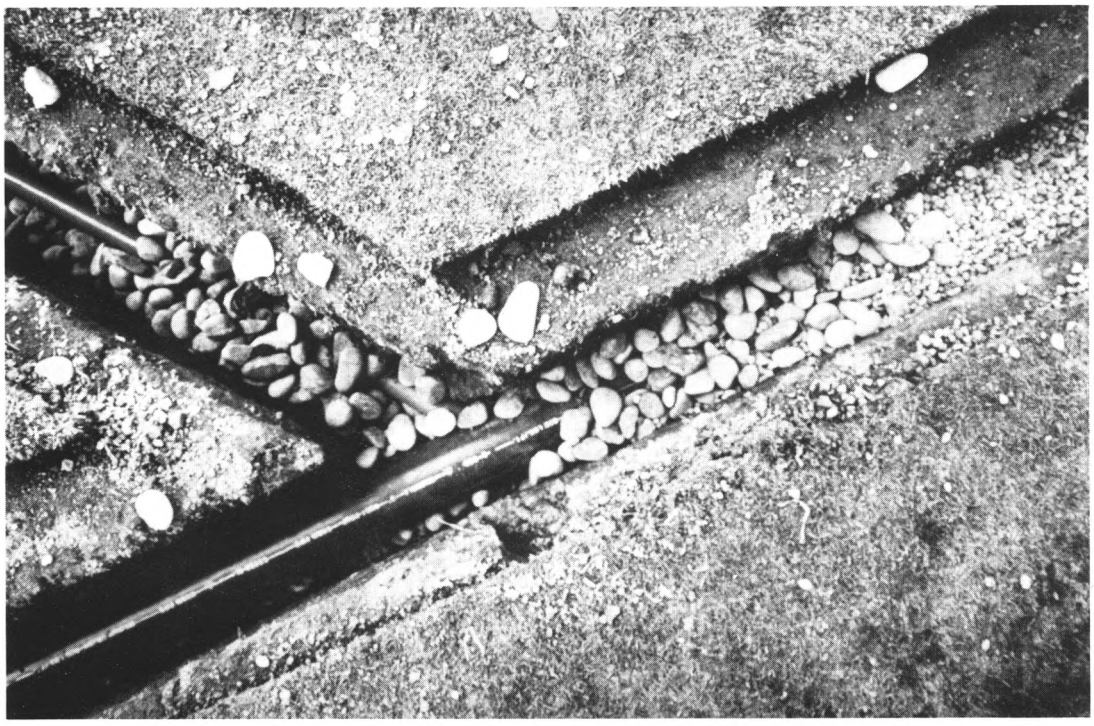
The further south below 34 degrees latitude, the more a superintendent will have to adhere to good management practices to minimize loss of bentgrass. Bentgrass will withstand heat, but heat plus moisture, poor drainage, or a combination of these, plus mismanagement of fertilizer, chemicals and irrigation can cause thinning or loss of the bent. Disease problems can be minimized through the proper use of fungicides and the latest methods of construction. With the excellent fungicides now available, formerly dread diseases need not be much of a concern today.

One hundred miles south of Atlanta is about as far south as bent is being used for permanent greens today. However, in the Southwest where the humidity is lower, bent is being maintained much further south, in Austin and San Antonio.

Increased cost of seed for overseeding bermudagrass greens will cause more southern superintendents to consider the use of bent as a year-round grass. Deep penetrating aerification equipment, i.e., punching holes six to eight inches deep and then filling them with the proper sand mix, should contribute to bentgrass establishment. The cost of growing bent should be about the same as bermuda, since annual overseeding of bermuda is expensive and counterbalances the amount of money spent for fungicides. Someday, with proper construction and management techniques, bentgrasses will be grown in the extreme South and replace bermudagrass greens.

Many questions have been asked during the past few years about the use of bentgrass in the South. Because it grows and remains green throughout the entire year, the inconvencience of two transition periods is eliminated. On this score alone, bentgrasses use in the South is certain to increase.

Main drain line and lateral being backfilled with coarse gravel.



Tim Sedgley, a senior at Colorado State U., gets a pointer from Dave Drocker, assistant superintendent at Cherry Hills.

Tomorrow's

by **LARRY EGGLESTON,** Superintendent, Cherry Hills Country Club, Colorado

Nearly every golf course superintendent in the business for any length of time has had the opportunity to hire and help turfgrass students of today. It is important for us to take a direct interest in these students, for they will be the golf course superintendents of tomorrow. Students can be a valuable asset on any maintenance crew because they have an intense interest in the profession and often have previous experience in golf or related fields. They can adapt quickly and become valuable, efficient employees. Practical experience is absolutely essential in today's world. With careful planning, we can help the student gain an experience every bit as valuable as his formal education. It has been said that a college degree may help one secure employment, but only experience will help him keep it.

We presently have many universities offering four-year degrees and many more offering two-year diplomas in turfgrass management. Whether a student's goal is a two- or four-year program, he should strive for a minimum of three seasons of practical, on-the-job experience. With a degree and at least three well planned seasons of experience, a student should have a good, solid background for entering his chosen profession. Depending on enthusiasm and experience, he might feasibly enter the profession anywhere from a greenkeeper right up to a golf course superintendent spot. The thought and care we give in helping train the student will influence how close to the top he starts.

Obviously, if a student only mows fairways for three months, he will have learned very little. Serious thought, therefore, should be given to how the student will learn the most from his work and at the same time, be of the most value to the permanent staff and its efficient operation. Clearly, no one can delineate exact procedures applicable to every turfgrass student. Nevertheless, following are some general guidelines that may stimulate your thoughts for training the student while maintaining him as a productive worker.

ROOKIES—To avoid hard feelings among members of the regular maintenance staff, the student must be made to work his way up like everyone else. The student should understand

Brad Klein, a junior at the University of Minnesota, here checks the effects of an algaecide treatment with Larry Eggleston.

Superintendents

clearly in the beginning that he is expected to carry more than his share of the load. You should rightfully expect him to have a deeper interest and dedication. Don't forget however, as with all employees, some will progress much faster due to their past experience and natural abilities. Try to strengthen his weak areas, but if he shows little or no initiative or desire to work, speak frankly with him. Tell him that he has apparently chosen the wrong profession and unless he has a complete change in attitude he will never make it. You'll be doing him a favor by getting him out of the business before he gets into it!

The rookie needs to learn the importance of the small but important tasks required in everyday maintenance. Rotary mowing, bunker raking, hand trimming, hand digging, greens mowing and watering are only a few of the chores he must master. If hard work bothers him, you will both find out soon and a discussion of his future would be appropriate.

It's important for all employees to know why they are performing each task, but with the student it's even more important. Make yourself clearly understood. If he is attentive, everything you say to him will be of value in his future work. As with all employees, commend him for work well done and criticize where it's constructive. Students hoping to become superintendents should learn early to accept criticism; they might well be in for a lifetime of it.

By the end of the first season, the student should know how to operate most of the smaller machines and should have developed an awareness of the amount of work that goes into maintaining a golf course. He should have developed a good working relationship with the assistant superintendent so that he can better learn the requirements of that position. Hopefully, the student will have an interest in golf. He should be encouraged to play golf at least occasionally after work. With growing general interest from his summer's experience, he should be encouraged to work hard at school and return the following year to further his on-the-job training.

SECOND YEAR—Having worked a full season, either at your golf course or another, and having a year or two of study under his belt, the turf student should now be ready to accept more responsibility. Depending on his skills, he should learn to operate every machine on the

course this summer. When extra work is necessary around tournament time, or when illness strikes a key employee, allow the student to fill in and watch him carefully. Changing cups on the weekends, spot watering and syringing, aerating and top-dressing, and assisting your key men with the fertilizing and spraying are typical tasks for the second-year man. Again, where possible, allow him to gain needed experience in his weaker areas. For instance, if he is not particularly mechanically inclined, maybe he could assist the mechanic with fairly simple, routine tasks when the work load piles up. He will thereby improve his skills in that area.

By the end of the second year, the turfgrass student should have a good working knowledge of every job on the course. You should be leaning heavily on him now for extra work as needed; as an occasional weekend foreman late in the season and, depending on your climate, he should spend a portion of the summer as an irrigator or waterman. Having learned to perform many tasks on the course during his second summer, he should be most valuable to you next season.

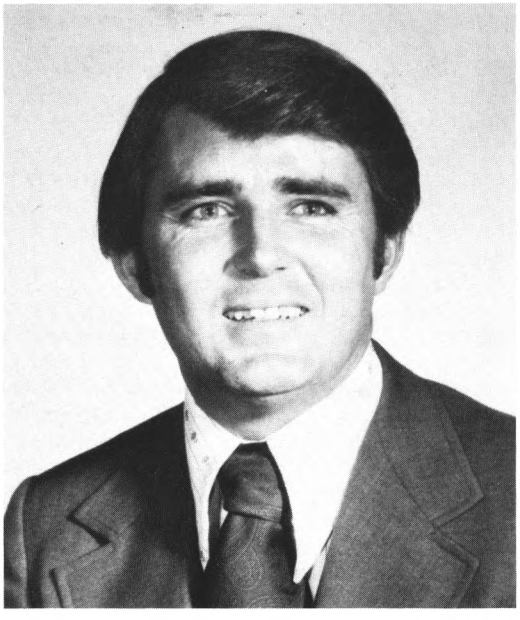
THIRD YEAR—The third year should find the turfgrass student prepared to handle any task on the golf course. He should now be working very closely with the assistant superintendent in setting up the course for play, in supervising small crews, and applying fertilizers and chemicals. After thorough consultation on a project, he should be allowed to make decisions and to follow the project through to completion. It might be well for him to be taking notes for his own good, concerning the responses of fertilizers and chemicals, the results of renovating procedures, climatic conditions, etc. This will help impress upon him the importance of good record keeping as a superintendent. If possible, involve him with other members of the club staff as well as club members themselves. Where feasible, encourage him to undertake off-the-course tasks. By now he should definitely be a key member of your staff.

He should be encouraged to attend local superintendents meetings, seminars, equipment shows, field days, etc. Help keep his mind constantly alert by quizzing him as to how he would handle different situations. Let him estimate fertilizer requirements, pesticide needs, etc., but at the same time impress on him that growing grass is often the easy part; handling the people is often where the problems lie.

By the end of the third season, the turfgrass student has had an opportunity to dig even deeper into the inner workings of your operation. After three seasons, what are his accomplishments? Hopefully, you will have provided him with valuable, useful knowledge and experience that his schooling cannot provide. Hopefully, you have utilized the services of an employee who is interested in his work and dedicated to it. Hopefully, he has been an asset to the maintenance staff. Hopefully, you have encouraged today's turfgrass student to think, to work hard and to enjoy his work as tomorrow's golf course superintendent.

ABOUT THE AUTHOR

Larry Eggleston added three summers' experience under Ted Rupel at Cherry Hills C.C., to his record while obtaining his B.S. from Colorado State University. This experience helped him secure the assistant superintendent spot at the 36-hole Broadmoor resort complex in Colorado Springs in 1964. After two years as assistant and four as superintendent (including the 1967 U.S. Amateur Championship), he moved back to his training grounds, Cherry Hills C.C., where he just completed his fifth season as superintendent.



Soil Amendment: Soil Physical Change[1]

by L. ART SPOMER, Assistant Professor, Department of Horticulture and Illinois Agricultural Experiment Station, University of Illinois, Urbana, Ill.

Soil amendment and soil mixtures are essential for green construction and maintenance. Much excellent information has been published on this subject by the USGA and others. Too often however, these articles detail what to do but not "what happens" when it is done. This article briefly describes the changes in soil physical properties when soils are amended.

Soils are amended to resist compaction and assure good drainage. In other words, amendments are used to produce or maintain sufficient soil porosity to ensure adequate aeration for turfgrass growth and maintenance. Soil porosity consists of large or macropores (noncapillary) or small or micropores (capillary). Macropores are the "aeration pores" which empty or drain rapidly even under the shallow perched water table prevailing under drained greens while micropores usually remain water-filled following drainage. A disturbed or compacted field soil usually contains few macropores and therefore provides poor aeration. On the other hand, a good amendment such as a monodisperse (single particle size) coarse-textured sand has almost 100 per cent macropores. A golf green requires a compromise between these two extremes, and this is usually achieved by mixing a coarse-textured amendment with the soil.

Figure 1 illustrates what happens to soil porosity when a coarse-textured, monodisperse sand is mixed with a soil in increasing amounts (left to right). The total or bulk volume of this mixture is a constant 10.0 cubic yards (yd^3). Beginning with 100 per cent soil (100 per cent micropores; poor aeration, good water retention), adding sand first decreases porosity to a minimum (dashed vertical line) then increases it until the "mixture" is 100 per cent sand (100 per cent macropores, good aeration, poor water

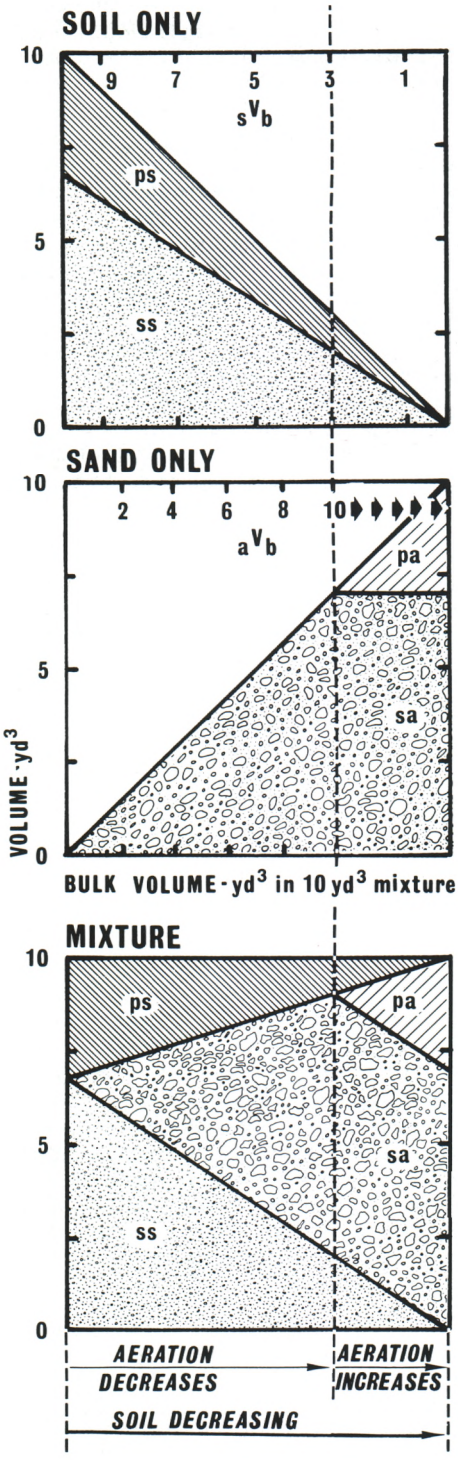


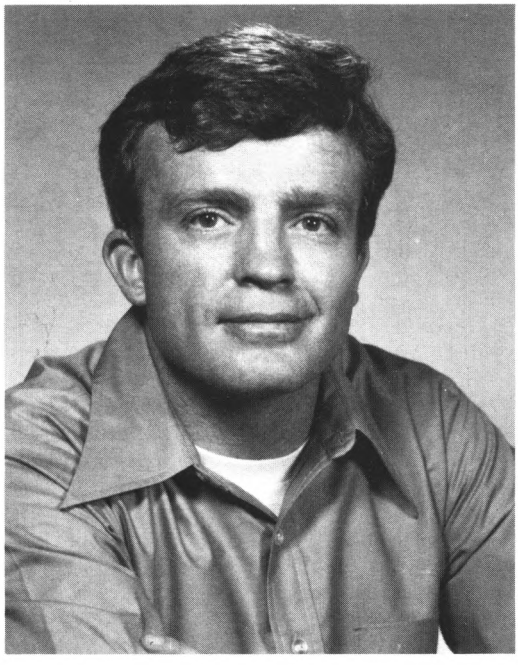
Figure 1. The effect of increasing amendment on soil and amendment solid (ss,sa) and pore (ps, pa) volume and their contribution to the mixture total. Sand was added to soil in increasing proportions with the mixture bulk volume remaining a constant 10 yd^3 (left to right). Sand and soil bulk volumes change at different rates. At the threshold proportion (dashed line), 10 yd^3 of mix contains 3 yd^3 soil + 10 yd^3 sand. If the proportion of soil is reduced from the threshold, large pores begin to open up (pa) and aeration should increase.

retention). The mixture having the least porosity is called the *threshold proportion*[2] because it represents the minimum or threshold amount of amendment required before soil physical improvement is effected. The threshold proportion, probably the worst possible soil mixture for plant growth, actually contains 10.0 yd^3 sand which is at its closest packing, but the macropores between the sand particles are exactly filled with 3.0 yd^3 soil. In other words, 10.0 yd^3 sand was mixed with 3.0 yd^3 soil resulting in only 10.0 yd^3 mixture and since the macropores are filled with soil, the only pores in the mixture are the small pores in the 3.0 yd^3 soil. Sand at less than the threshold "floats" in or occupies soil volume without forming macropores. If the proportion of soil is reduced from the threshold, macropores gradually empty and aeration and resistance to compaction increases. The threshold proportion is determined by amendment macroporosity (in this example: macroporosity = 3.0 yd^3 pores per 10.0 yd^3 sand; threshold proportion = 10.0 yd^3 sand + 3.0 yd^3 soil). Factors increasing amendment macroporosity (e.g. particle size distribution, shape) increase amendment efficiency; lesser amounts of amendments with high macroporosity are required to provide good aeration. Well-graded or polydisperse materials (contain a wide range of particle sizes) are poor soil amendments because they contain much fine-textured material which, like soil, fills the macropores and reduces aeration. More-rounded amendments (e.g., river sand and gravel) tend to pack more tightly and therefore have a lower macroporosity and are less effective as soil amendments than more-angular amendments (e.g., crushed sand and gravel, bark, sawdust, peat). Some soil-amendment combinations tend to separate by washing and settling or may compact with time and therefore are not suitable for long-term applications such as green construction. Any testing of soil mixtures should be done on compacted samples since this best approximates long-term use.

In summary, this article does not recommend any specific soil mixture for greens but briefly describes what happens when an amendment such as sand is added to a soil. The "take-home lesson" is that a certain minimum proportion of amendment, the threshold proportion, is required before soil physical improvement is effected and this amount is usually quite high (75-90 per cent of total bulk volume of components). The optimum amendment proportion depends on the soil, amendment, climate, and plant and is therefore difficult to determine without professional assistance.

[1] Portion of Dept. Hort. and Ill. Agric. Expt. Sta. Proj. No. 65-353.

[2] Spomer, L.A. 1974. Optimizing container soil amendment: the "threshold proportion." *HortScience* 9 (in review).



ABOUT THE AUTHOR

L. Art Spomer is Assistant Professor of Plant Physiology in Horticulture at the University of Illinois, Urbana, and is responsible for teaching and research in Horticultural Crop Physiology. Dr. Spomer received his B.S. from Colorado State University and M.S. and Ph.D. from Cornell. His current primary research interests are plant water stress and container plant-soil-water relations (quite similar to drained greens). He is currently involved in a USGA Green Section study of turfgrass water stress resistance.

Open Letter to the Club Membership

by **HOLMAN M. GRIFFIN,** Director, USGA Green Section Mid-Atlantic Region, Charlottesville

DEAR CLUB MEMBER:

It is definitely not my intention to bore you with a lot of agronomic facts, however, I would like to leave you with some interesting observations on your management team. We need to look beyond what we call the "user's itch" or the appearance of the playing surface on a golf course to fully appreciate what went into making it good or bad, as well as for an honest evaluation of your management team. Of course this most often leads straight into agronomics, but let's forget about that aspect and approach the subject from a different angle.

There are many golf courses in the country that have a reputation for always being in great condition, and it is no coincidence that these courses have at least three things in common; more than 18 holes, an adequate budget, and good management. The first common element has to do with traffic. By virtue of having more than 18 holes, a portion of the golf course can be closed for maintainance without disrupting play, therefore, the maintenance goes on, but you don't see it.

Certainly there are exceptions to every rule, and a good substitute for additional holes might be a minimum amount of traffic, or simply closing nine of 18 holes for maintenance on any given day. Any course that has less than 50 rounds of play a day (18,200 to 20,000 per year) and/or less than 20 golf carts has a tremendous advantage regardless of other considerations.

Fine and dandy, all you have to do now is get ride of 75 golf carts and expel two-thirds of your golfing membership to have fine turf. The economics of that situation are badly out of balance, but no more so than trying to maintain, or to expect excellent grass on your golf course at a price of $1,500 per hole per year. The national average per hole for golf course maintenance in 1973 was $6,554.00.

Before you jump to any conclusions based on that figure, i.e., your budget is too high or too low, you might believe that an *average budget* will give you an *average golf course.* But even this is not necessarily true. Last year I visited golf courses with budgets ranging from just over $26,000 to $160,000 for 18 holes. There are literally hundreds of items that cause such a disparity, and I believe there was little fat in either budget figure. Chevrolet and Cadillac are both General Motors products with a great many essential features in common. They do somewhat the same job, but there is a vast difference in initial cost, cost of maintenance, and class. This analogy applies just as well to golf courses as it does to automobiles. The style you maintain is directly proportionate to the amount of money spent.

Now tie all this together with the third ingredient found at most well kept golf courses —good management. Most golf clubs have an "executive director" or green committee chairman and an "administrator" or golf course superintendent. These positions carry separate responsibilities, and yet they are so closely related that no distinguishable line can be drawn between them. Quite often a strong green chairman or a strong superintendent may assume almost all of the work load for both jobs, yet seldom does a golf club make a single individual responsible for both positions. No matter how the responsibility is divided, there must be close cooperation and mutual understanding between the green committee chairman and the golf course superintendent.

If your membership selects a green committee chairman simply because he is a good golfer, has time on his hands, promises to keep the greens cut short, or because he was elected to the Board of Directors of the club and someone on the board has to take the job or some other similar reason, you may well be headed for a host of problems.

A good chairman is a man who understands and appreciates both the problems of the golfing membership and the golf course superintendent. He seldom involves himself in the mechanics of the operation for the same reason that the president of General Motors (going back to a comparison of automobiles and golf courses) doesn't work on his assembly lines. He hires competent people to handle the mechanics of the operation and then depends on their experience and knowledge. His talents are mostly devoted to the corporate structure and financial aspects. If a green committee chairman dictates what is to be done on the course from day to day and how to do it, you don't have, and probably don't need, a golf course superintendent. In this situation you probably have a golf course superintendent pictured in your mind's eye as a subservient, somewhat

BEFORE AND AFTER. Good working conditions make a great deal of difference. Which type of maintenance building does your club provide?

inarticulate, poorly educated grass cutter, most often found at the barn with a three day growth of beard and dirty clothes. So what is a golf course superintendent anyway? The majority of modern superintendents have a college certificate in turf maintenance, many have a four-year college degree, and a few have advanced degrees. They may also be "certified golf course superintendents" in lieu of, or in addition to the above.

If it surprises you that anyone would go to college to learn how to cut grass, then you haven't tried to read any of the more recent turf management publications. Most of us don't trip lightly over words like isobutylidene diurea, 2,4-Dichlorophenoxy acetic acid, and photo phosphoralation—to mention a few. In addition to knowing a few big words, a golf course superintendent needs competence in budget preparation, personnel management, equipment maintenance, public relations, and countless other areas. Growing grass may well be the easiest part of the job. Just remember though, even a top manager isn't equipped with a magic wand. He must have something to work with.

If this sounds like pleading the cause for equal rights of a minority group, please forgive me. Respect and recognition have to be earned, but I do hope after reading this you will have a somewhat different outlook on the management situation as well as some awareness of your responsibility to and for the efforts of your management team in your behalf.

The Turfgrass Service of the USGA Green Section

Direct turfgrass advisory visits to USGA Member Clubs started in June, 1952. In the 22 years since then, the Green Section Staff has increased to eight specialists, and it has made over 25,000 golf course visits! Every USGA Member Club should be a subscriber, for you have information other clubs need and can use. Why not put this highly trained team to work for you on your course?

Every club subscribing to the Green Section Turfgrass Service receives the following benefits yearly:

1—Several direct conferences with a Green Section agronomist, in this manner:

A—A scheduled half-day, on-the-course consultation, followed by a written report from the agronomist to the Course Superintendent and Green Committee Chairman or club representative. Second visits are available at reduced cost if requested.

B—Consultation with the agronomist at local group meetings and turf conferences.

2—Assistance by correspondence and telephone.

3—A subscription to the USGA *Green Section Record*, dealing with golf turf affairs, six times a year, addressed to the Golf Course Superintendent. (This is in addition to the subscription sent to the Green Committee Chairman in connection with USGA Membership.)

4—A voice in the direction of turf research whose results benefit golf courses. The subscription fee covers all services and expenses; there are no extra charges for travel. (The fee for the Green Section Turfgrass Service is additional to dues for USGA Membership). A list of regional Green Section offices can be found inside the front cover.

APPLICATION FOR TURFGRASS SERVICE OF USGA GREEN SECTION

(Open to USGA Members only)

Date _____, 19_____

Full Name of Club or Course _____

Permanent Mail Address (street or box) _____

Post office _____, State _____ Zip_____

Application authorized by: _____ Title _____

Course Superintendent _____

We hereby apply for the Turfgrass Service of the United States Golf Association Green Section and certify that we are eligible for the class checked below.

We enclose the fee (see schedule below) for the current year ending December 31. The USGA *Green Section Record* is to be addressed to our Golf Course Superintendent (this is in addition to the subscription sent to our Green Committee Chairman in connection with USGA Membership).

This application is automatically continuous from year to year unless interrupted by advance resignation.

Check Proper Class:

_____ Less than 18 holes $250
_____ 18 to 27 holes $300

More than 27 holes:

_____ 36 holes $325
_____ Per regulation course in addition to 36 holes . . . . . $ 75

Please send receipted invoice

Requests to agronomists for second visits will entail an additional charge of $100. For the third or more requested visits within the year, an additional charge of $200 each will be made. Clubs will be billed in October for all additional visits during the year.

USGA GREEN SECTION RECORD
NOVEMBER 1974

TURF TWISTERS

SANDS TOO SOFT

Question: For years my membership has complained about hard sand in the bunkers. This summer I acquired a mechanical sand rake to save some weeding and raking labor, and to soften the hard sand. Now they complain that the sand is too soft. What can I do? (Conn.)

Answer: Perhaps in your case you are raking the sand too deeply and/or too frequently. First, check the setting for depth of the rake and adjust accordingly. Depending upon the bunkers themselves and the type of sand in them, only a complete raking with the machine once or twice a week may be necessary. On the off days, only the outstanding footprints could be smoothed. This should keep the sand soft (as it should be) but not too fluffy, and also it should reduce the total labor involved.

FOR BLUEGRASS BLENDS

Question: We are hearing a lot about new strains of Kentucky bluegrasses developed through breeding programs like the one the Green Section is supporting at Rutgers University. How do these new grasses stand up to Merion, the first of the improved varieties, and in my mind still one of the best. (New Jersey)

Answer: You are right. Merion is still one of the best Kentucky bluegrasses. All Kentucky bluegrasses, including Merion, and even the new varieties, have some weaknesses. There is no one best Kentucky bluegrass for any area of the country. It is for this reason that we recommend blends of three, four, five or even more of these improved grasses. With more water, fertilizer, and lower cuts, it is imperative that these improved strains be used to replace the common types. When choosing a blend of Kentucky bluegrasses, it would be to your advantage to attend university field days to see for yourself which of these grasses does best in your area. With this information you could then set up your own blend of the grasses that you like and that performs the best for your region.

ON WINTER GREENS

Question: Help! Help! We usually have a heavy infestation of *Poa annua* in our overseeded bermuda greens by mid to late winter. What can we do? (Miss. and Ariz.)

Answer: The use of a pre-emergence herbicide prior to overseeding has been very effective but hazardous. You might hold off on the pre-emergence material until late November or early December. This should give the fall overseeding a chance to become established and still check *Poa annua* germination in the early winter months.