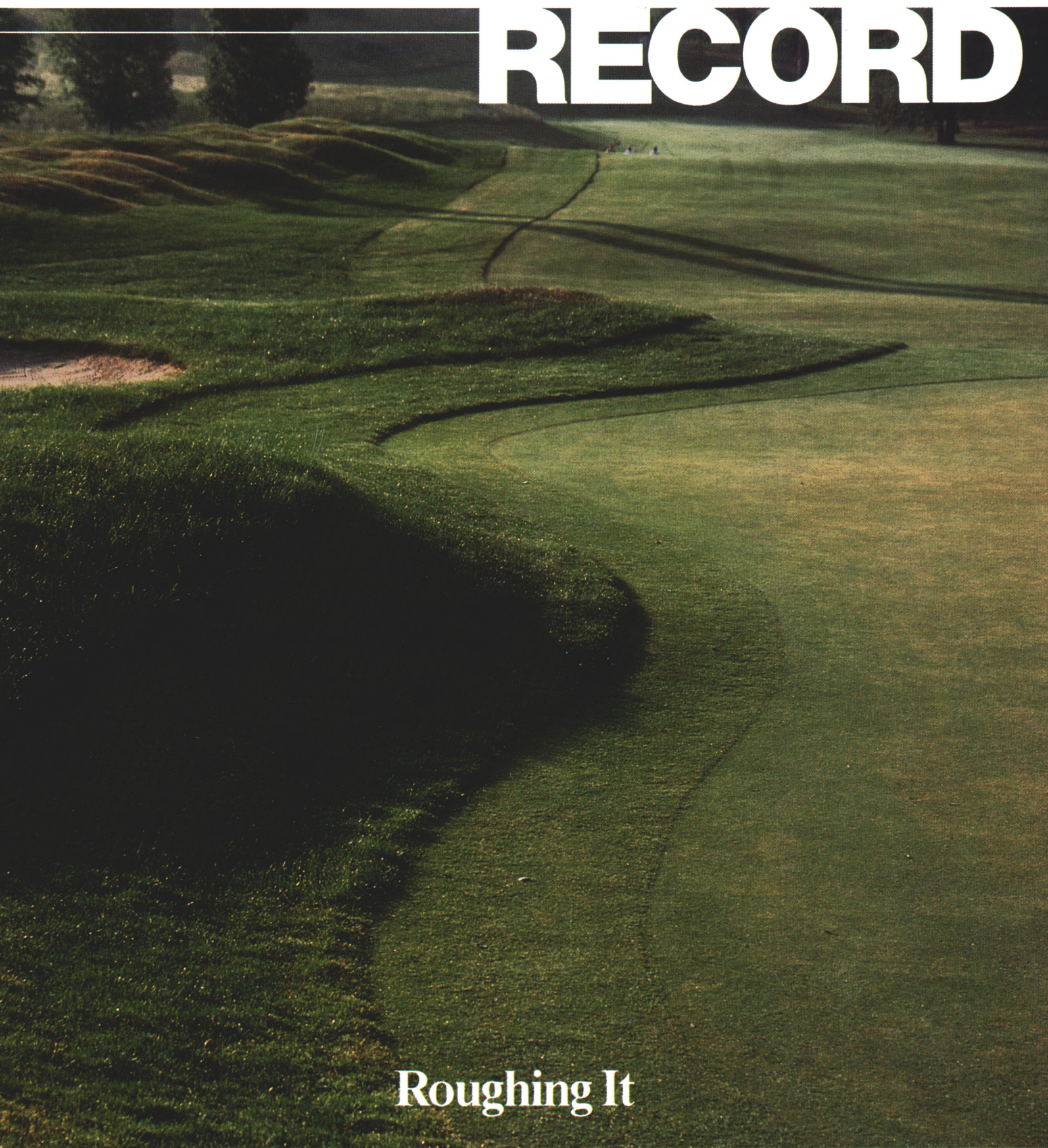


USGA®

Green Section **RECORD**



Roughing It

USGA®



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*Cover Photo:
Rough is hardly the word for the
eight hole at The Country Club,
Brookline, Massachusetts, during
the 1988 U.S. Open.*

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ROUGHING IT

by JAMES T. SNOW

Director, Northeastern Region, USGA Green Section

WHY IS IT THAT roughs are becoming more and more the object of golfers' comments and attention? It wasn't so long ago, after all, that greens were the only areas most golfers concerned themselves with.

Perhaps the answer has something to do with the nature of today's golfers, who expect each area to be consistently perfect every day of the year. The most important factor for many golfers, though, is that the roughs come into play more frequently than they once did. With the advent of lightweight fairway mowing in the past decade, fairway acreage has been halved on many courses, and the widths of fairway landing zones have been reduced from a range of 40 to 50 yards to a much narrower 25 to 35 yards. This change has been a simple economic one; because golf courses could not afford to use lightweight mowers and otherwise intensively maintain 50 acres of fairway turf, they have reduced their fairways to a size they can afford to mow.

It is predictable, then, that more shots will land in the rough, so it is not surprising that golfers are more concerned than ever about the quality and uniformity of the turf in the roughs. Suddenly golf course superintendents find they cannot simply mow the roughs once each week and then forget about them. The superintendent must contend with increased use of golf carts, inadequate fairway irrigation systems, and widespread tree planting.

IT IS DIFFICULT enough to maintain uniform turf over broad areas of rough, given the effects of trees, different soil types, and varying terrain. The soil compaction and turf abrasion effects of golf cart traffic, though, can make the job particularly challenging, especially because generally the rough areas most severely affected by cart traffic receive the greatest play.

To grow good quality rough turf successfully under variable conditions and

heavy traffic, superintendents must follow the principles of turfgrass science adhered to on greens, tees, and fairways. Fertilization is among the simplest and most effective programs, yet it is underutilized on many courses. Regular fertilization increases turf density and vigor, promoting wear tolerance and recovery from wear and other damage, and produces a more uniform playing surface. It also helps minimize crabgrass and broadleaf weed encroachment. PH levels should be checked and adjusted with limestone, if it is necessary, to obtain the best results from the fertilizer. It is amazing what limestone can do to improve turf vigor on neglected rough areas where low pH levels have existed for decades. Rough areas that are in play should generally be fertilized at least once or twice each year, with heavily trafficked areas given several applications for wear recovery.

Irrigation is critical if good quality roughs are to be maintained, especially in trafficked areas. Irrigated rough turf

The results of a policy of keeping golf carts in the roughs at all times. Note that the damage is worse near the tree.



(Below) A typical undefined fairway/rough border addressed by (right) overseeding with ryegrass at the Knickerbocker Country Club, Tenafly, New Jersey, and by (far right) sodding with Kentucky bluegrass at the Park Country Club of Buffalo, in Williamsville, New York.



is normal in arid parts of the South and West, but it is uncommon in most northern areas where periodic summer rainfall is expected. During a dry summer, though, the only moisture reaching the roughs consists of water that extends from a single- or double-row fairway irrigation system. Sometimes this is adequate; often it is not. A golf course must then accept the decline of the turf, or else expand the irrigation program by running hoses and sprinklers to important rough areas from quick-coupler valves in the fairways. Some have expanded their fairway irrigation systems to three or more rows, to encompass more of the roughs. In important rough areas on the banks of greens and surrounding areas, two-speed heads or supplemental perimeter irrigation systems have become more common and more easily justified from a cost standpoint than systems running along great expanses of rough adjacent to fairways. One way or the other, though, turfgrasses need adequate moisture to grow and thrive.

AERIFICATION and other forms of cultivation are common on greens, tees, and fairways, and are needed as well in rough areas where soil compaction contributes to turf weakness. It should be done as often as needed to overcome the effects of golf cart traffic,

at least several times each year, typically in early spring or fall, when the soil is adequately moist and easy to penetrate. A new twist to the traditional program of aerification involves the use of the Verti-Drain aerifier in compacted areas where cart traffic concentrates. This unit uses long, solid tines that can penetrate to about 15 inches, and produces a kicking action that fractures the layers of hardpan. Soil porosity increases, improving root growth and internal drainage. Increasingly used on greens, tees, and fairways, the Verti-Drain aerifier should be used often in compacted rough areas as well.

Trees are among the most insidious causes of weak turf in roughs, as well as in greens and tees. Turf grown in partial shade will always be weaker and less tolerant of cart traffic than that grown in full sun. Less obvious, perhaps, but equally important, tree roots produce a negative impact on turf growth. They rob the turf of water and nutrients, quickly placing the grass under great moisture stress during dry weather. When stressed turf is then subjected to heavy cart traffic, it becomes thin much sooner than turf in clear areas. The effect of tree roots is often dramatically illustrated in areas where they've been cut, either intentionally or as a consequence of irrigation or drainage installation. Turf on the tree side of the trench is very often

thin, weak, and brown, while the turf on the other side, where tree roots no longer function, is lush, green, and vigorous. Recognizing that strong, healthy turf is more tolerant of cart traffic, and forms a more desirable playing surface, many courses prune roots along the tree lines in their roughs, leaving enough turf between the trench and the fairway to accommodate cart traffic and normal rough play. (See illustration.)

Root pruning around greens and tees typically involves cutting an 18- to 24-inch-deep trench between the trees and the desirable turf area, placing several layers of tarpaper or some other barrier along the wall of the trench to discourage the roots from encroaching, then refilling. Because this procedure can turn into a time-consuming and expensive project when dealing with trees along the perimeter of 18 fairways, some courses use a vibratory plow or stump grinder to trim the tree roots, a practice that must then be repeated every two or three years.

IN THE COOL, humid North, determining which grass species to cultivate had never been much of a consideration. It was generally the practice to establish new roughs with a mixture of Kentucky bluegrass, fine fescue, and perennial ryegrass, allowing each species to predominate in the particular area where it is



most adapted. This remains a good recommendation in the unirrigated ground, but fine fescues will never persist in rough areas that are irrigated, fertilized, and cultivated to accommodate cart traffic.

Kentucky bluegrass and perennial ryegrass form a good combination for the irrigated, trafficked roughs adjacent to the fairways, with the bluegrass contributing recuperative ability and the ryegrass wear tolerance. Trying to renovate bent/*Poa annua* roughs or establish new turf in thin, worn areas by overseeding the bluegrass and ryegrass into existing turf areas, though, presents problems because Kentucky bluegrass lacks competitiveness in the seedling stage, and it is rarely successfully overseeded into existing turf, either by itself or in combination with ryegrass.

This leaves three options for dealing with bent/*Poa* roughs or other existing rough overseeding needs:

1. Use straight perennial ryegrass at a rate of six to 12 pounds per 1,000 square feet, depending on the effect desired. This method sacrifices the recuperative ability and sod-forming characteristics of Kentucky bluegrass. It usually takes at least several years of overseeding to obtain good turf density.

2. Strip the established turf with a sodcutter, or kill it with Roundup, and seed a mixture of 80 percent Kentucky bluegrass and 20 percent perennial ryegrass on bare soil. This perhaps provides the best long-term results, but it requires patience during establishment.

3. Strip the existing turf and sod with Kentucky bluegrass. This method produces immediate results, but it is expensive, and it would require follow-up overseeding work with perennial ryegrass in highly trafficked areas.

AS THE USE of golf carts has increased at many golf courses, and the demand for top-quality fairway turf has grown, it was easy to restrict carts primarily to the roughs and avoid the compaction and abrasion effects carts cause to fairways. It became obvious soon, though, that this policy was having a negative impact on the appearance and playability of the most heavily played part of the rough. The problem is that when carts are restricted to the rough, golfers inevitably drive their carts immediately adjacent to the edge of the fairways. This confines and concentrates the soil compaction and abrasion effects of cart traffic to a narrow band of turf that eventually weakens and thins in direct proportion to the amount of traffic received.

Several different approaches can be taken to deal with the problem. One involves intensifying the maintenance programs in these areas, as discussed previously. Providing adequate irrigation and drainage, cultivating periodically, spraying for weeds, insects and diseases, overseeding as needed, fertilizing regularly, and following through with tree root pruning work would be among the recommendations at most courses.

Bent/*Poa annua* rough areas should be converted to Kentucky bluegrass and/or perennial ryegrass, and predominately Kentucky bluegrass or bluegrass/fine fescue rough turf should be overseeded with perennial ryegrass to increase its wear tolerance. Turf-type tall fescues are being successfully used in some areas, but rarely in the cool, humid North, where Kentucky bluegrass thrives. Finally, keeping the cutting height above two inches on cool-season grasses will increase wear tolerance.

The other approach to dealing with cart damage involves trying to distribute the traffic over a much larger area, thereby minimizing injury to the roughs adjacent to the fairways. This could involve one or more of the following strategies.

- Install cart paths and restrict carts to the paths, a) during wet or difficult weather conditions, b) at all times, c) on certain holes at all times.

- Allow carts to ride the fairways, a) when weather conditions are favorable, b) at all times if the fairway turf can handle it.

- Use painted lines, stakes, or stakes and ropes to direct carts away from the edges of the fairways. These items can be moved from week to week to facilitate good wear distribution.

- Move or remove trees located too close to the edges of fairways, or that restrict cart traffic to narrow, confined areas. Fairway sand bunkers sometimes cause the same problem, but they can often be redesigned or relocated to improve traffic flow.

In dealing with the increasing cart traffic on golf courses today, chances are both approaches will have to be taken to avoid damage to the roughs.

ONE OF THE MORE recent issues concerning the maintenance of roughs has to do with the intermediate cut. Once seen only during championship events on television, the intermediate rough is now routinely found on many courses, sometimes justifiably and sometimes as a faddish reaction to televised golf. Intermediate roughs, usually six to 10 feet wide and cut at a height intermediate between the regular roughs and the fairways, are certainly worthwhile when the regular rough is being cut at a height of 2½ to 3 inches or more. In this case, an intermediate height of perhaps 1½ to 2 inches serves as a penalty for just missing the fairway without being unduly harsh. An intermediate cut is also common on golf courses that have recently narrowed their fairways to accommodate lightweight-mowing programs, thereby placating golfers who would otherwise be irate at having to hit 25-yard-wide fairways.

On the other hand, it seems ludicrous to maintain a 1- to 1¼-inch intermediate rough when the regular rough is being cut at 1½ to 2 inches. Not only is it an extra expense to maintain the intermediate cut, but the definition between the fairway and the various rough levels is often lost as well. Officials at these clubs insist the intermediate cut is justified because the regular roughs often grow much higher between mowings during peak growing weather. It is better to eliminate the intermediate cut, but make an extra pass each week around the rough perimeter adjacent to the fairways, keeping this area at a more consistent level.

The height of the rough becomes a topic of controversy at many courses, a subject that has no right or wrong answer. In cool-season grass areas, heights of 1¼ to 4 inches or more can be found.

To talk about cutting heights can be misleading, though, because the difficulty of playing from a rough area de-

depends as much or more on the density of the turf as it does on cutting height. Such factors as moisture availability, soil texture, tree effects, grass species, and cultural practices could all affect turf density. For USGA championships, the roughs are designed to invoke a half-stroke penalty. To establish this degree of difficulty, a two-inch height might be all that is necessary at the Girls' Junior Championship, while a height of four inches might be appropriate for the U.S. Open. Thus, the appropriate height of cut at a particular course must be based upon the density of the turf and the desires and abilities of the golfers.

That tractor tires and reel mowers tend to mat the grass down rather than cut it off uniformly causes difficulties in maintaining roughs higher than 2½ to 3 inches, or trying to cut down rough that has grown out of control during a flush of spring growth. In answer to this, more and more courses are switching to rotary mowers. Rotary mowers tend to lift the grass and cut it uniformly regardless of height. They are also much more effective than reel mowers for cutting the tough seed stalks of grasses and broadleaf weeds. Front-mounted riding rotary mowers are ideally suited for trimming around trees and for mowing areas inaccessible to tractor-mounted reel units. They should be standard pieces of equipment at most courses today.

Many women and senior men golfers have a pet peeve: They complain of the

broad area of rough they often must carry to reach the fairway surface from the tee. As alluded to previously, these rough areas were established in an effort to reduce the number of acres that must be maintained with lightweight mowers or at fairway intensity. A reasonable rule of thumb suggests that the fairway should begin not more than 75 yards from the ladies' tee marker, nor more than 125 yards from the regular men's marker, depending on the distance between the various tee areas. An alternative is to maintain a broader intermediate rough cut at the tee end of the fairways, from which most golfers wouldn't mind playing. Also, the addition of forward tees might well resolve the problem on certain holes.

AS ANOTHER faddish trend, many courses today allow the grass to grow to its natural height on mounds, bunker banks, tee banks, and out-of-play rough areas, in the style of Shinnecock Hills, Cypress Point, and some other sand-based American and British golf courses.

Therein lies the key; turf growing on unirrigated, sandy, infertile soils tends to be rather sparse and fine textured, allowing a golf ball to be found and a shot to be reasonably hit even when it grows to a height of a foot or more. As they develop, the seed stalks lend a graceful, flowing presence to the golf course. On the other hand, when this style is

adopted at golf courses where heavy textured soil predominates, the result is usually disastrous.

Allowed to grow unhindered, the bluegrasses, ryegrasses, and other coarser textured species that grow well in heavier, fertile soils, become dense and matted, leaving an unsightly jungle where it is nearly impossible to find your ball, much less play a shot.

Allowing mounds and out-of-play rough areas to grow can be aesthetically effective and save a significant amount of mowing time, but it shouldn't be forced where the conditions aren't amenable. Also, allowing the grass to grow on a mound here and a bank there usually looks contrived and out of place. If it can't be done over broad areas of the course to provide some continuity, then it probably should not be done at all.

FOR MANY GOLF courses, maintaining roughs just isn't what it used to be. Time and money must now be spent on cultural maintenance programs designed to accommodate the heavy use of golf carts and the desire of golfers for a more consistent, uniform playing surface. These changes also lead to large capital expenditures for cart path construction and irrigation system expansion at many facilities. By giving careful consideration to the agronomic needs of the turf, cart use policy, and tree effects, the best decisions can be made for taking the roughshod out of the roughs.



(Above) The dramatic effect of tree root pruning designed to enhance the vigor and density of the rough turf adjacent to a fairway. Greenacres Country Club, Lawrenceville, New Jersey.

(Right) Perennial ryegrass patches survive where nothing else does on a heavily trafficked path across an unirrigated fairway. When it is overseeded into trafficked roughs, ryegrass lends wear tolerance to the turf stand.



A Report on the New Grasses Being Developed for Golf

by **DR. VICTOR A. GIBEAULT**

University of California, Riverside, California

THE SUMMER drought of 1988 has once again reminded all of us involved with golf of the fragile nature of our water supply, and of our dependence on the amount and quality of that water. It seems particularly timely that turfgrass breeders who receive major support from the USGA for development of moisture-conserving new grasses for golf met recently. The meeting provided an opportunity to exchange research ideas and report on the progress each breeder is making toward that goal.

Funding for this breeding work is part of a 10-year research project guided by the USGA Turfgrass Research Committee. It is the objective of the Research Committee (comprised of university and industrial research specialists, GCSAA members, and USGA Green Section personnel) to:

- Substantially reduce water use on golf facilities.
- Substantially reduce maintenance costs.

- Encourage young scientists to become leaders in turfgrass research.

The Research Committee decided early that several methods would be used to reach these objectives. One of the primary means is through extensive plant breeding programs to develop new water-efficient and cost-efficient grasses. Tremendous progress has been made, and exciting developments are underway. Here is an update:

Bermudagrasses are being developed by Dr. Charles Taliaferro and a research team at Oklahoma State University that will be seed-propagated, cold-tolerant, and fine-textured, useful for golf courses in the northern half of the bermudagrass belt. Dr. Taliaferro noted that the breeding method he uses will increase the frequency of favorable genes for the selected characters. Desirable plants can be used as parents in the creation of a new bermudagrass variety, or individual plants can be vegetatively propagated. Dr. Taliaferro hopes to be able to field test parent

lines for seed production and turfgrass quality characteristics. If all goes well, a new bermudagrass with the desirable characteristics may be released as early as 1991.

A second bermudagrass program, directed by Dr. Arden Baltensperger, of New Mexico State University, resulted in the release of an improved seeded variety in the spring of 1987. A Nu Mex Sahara bermudagrass breeder seed field has been established near Yuma, Arizona, and three foundation seed growers have been selected because of their reputation for producing high-quality bermudagrass seed.

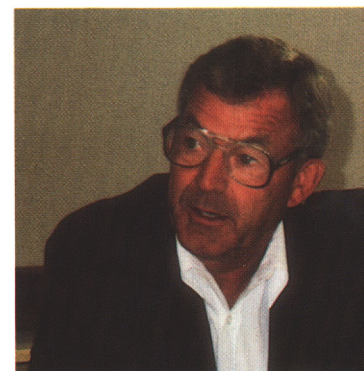
Some seed of Nu Mex Sahara should be available in 1989, which will be the first commercially available new grass from the USGA/GCSAA research effort. Nu Mex Sahara bermudagrass is an improvement over common bermudagrass, because it has shorter leaves, shorter internode, greater density, and somewhat better color.



In attendance were (left to right) President John Segui, of the GCSAA; Gordon Scott, USGA Green Section Committeeman; Dr. Peter Hayes, Director of The Sports Turf Research Institute, of England; and F. Morgan Taylor, Jr., of the USGA Executive Committee.



Dr. Charles Taliaferro, Oklahoma State University.



Dr. Arden Baltensperger, New Mexico State University.



Dr. Milton Engelke, Texas A&M University.

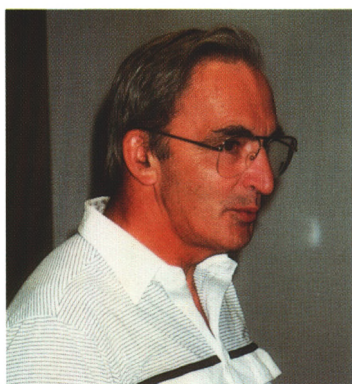
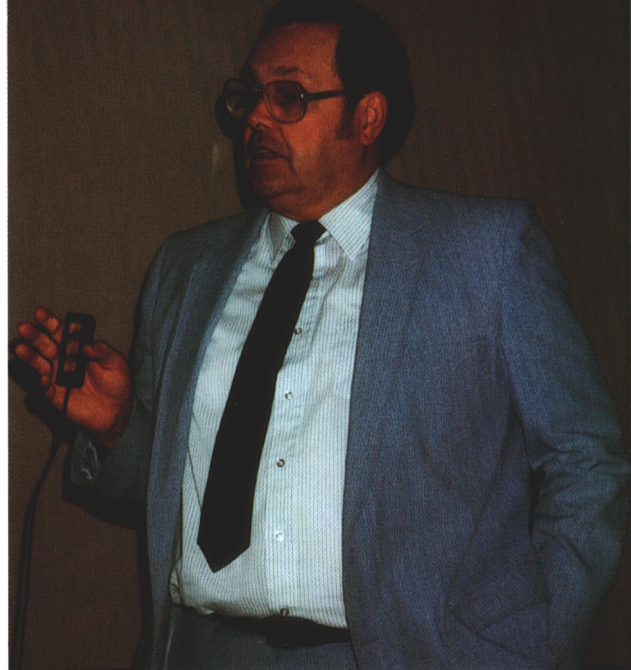
Dr. James Beard, of Texas A&M University, reviewed his plant stress mechanism research for the plant breeders.



*Dr. Terrance Riordan,
University of Nebraska.*



*Dr. Robin Cuany,
Colorado State University.*



*Dr. Donald White,
University of Minnesota.*



*The Research Committee and plant breeders toured the
research farm of Turf Seed, Inc., in Hubbard, Oregon.*

Dr. Milton Engelke, of the Dallas Station of Texas A&M University, is improving zoysiagrasses for tees and fairways. Someday he feels zoysiagrasses from his program will also be suitable for greens. Two new zoysiagrasses from his breeding efforts, currently labeled DALZ 8501 and DALZ 8502, are vegetatively propagated grasses that have an improved ability to recover rapidly from divoting, scarring, and general injury. This is a major breakthrough, since slow recovery from injury has been a major drawback with zoysiagrass. Dr. Engelke expects the zoysias to be available for commercial increase in either 1989 or 1990.

THERE IS great interest in developing improved native grasses for golf use, because of their ability to survive and give good cover under stress and low moisture conditions in areas where they are adapted. Such grasses may be used in play areas, such as fairways, and possibly tees, but they would be particularly useful in non-play or out-of-play locations on a course with minimum maintenance.

Dr. Terrance Riordan, of the University of Nebraska, discussed a buffalograss improvement program that has developed turf types adapted to the plains states. He noted that the summer drought and high temperatures in the

central Great Plains slowed vegetative growth of the buffalograsses that were under drought stress in some locations this summer. He felt, however, that this species has fared much better than Kentucky bluegrass or tall fescue, and that a simple irrigation would increase quality and color, and allow it to resume growth. He states the release of the first improved buffalograss, NE84-315, is on schedule. Wider ranges of adaptation for buffalograss are also being investigated.

Dr. Robin Cuany, of Colorado State University, is breeding four native western grasses for turf use. These grasses include alkaligrass, blue grama, fairway wheatgrass, and inland saltgrass. Dr. Cuany

has amassed a large amount of native grass germplasm, and is quite far along on the production and release of an improved alkaligrass he has developed.

Dr. Charles Mancino, of the University of Arizona, is studying mesquitegrass, a native Arizona strain that hasn't been used for golf. Research efforts will focus on seed quality and improved germination through selection and imposed treatments. Other primary goals, according to Dr. Mancino, are the reduction of leaf texture and plant stature, and the development of soil-stabilizing plant materials.

DR. MILTON ENGELKE, of Texas A&M, is also working to improve creeping bentgrass. Specifically, he is selecting for high-temperature stability,

resistance to pythium, resistance to thatch development, wear tolerance, and sustainability for commercial sod production. Dr. Engelke uses a heat bench for screening creeping bentgrasses with advantageous characteristics. He reported his research team has developed two synthetic varieties that should have superior performance under both high soil and air temperature conditions with improved quality, resistance, and color. He will test his new grasses under various environmental and cultural conditions in the near future.

At the University of Minnesota, Dr. Donald White has been collecting and, through breeding studies, attempting to improve annual bluegrass, or *Poa annua*, for use on golf course greens, tees, and fairways. Often considered a weed, *Poa*

annua has many positive turf characteristics that Dr. White hopes to focus on. For example, he has found plant types that survive under much higher temperatures than thought possible with this cool-season grass. At present, he has 7,000 crosses that need investigation, so the variation in his plant material is tremendous. Dr. White noted: "We're just beginning to discover some of the basic mechanics of *Poa annua*. We're surprised at what we're finding."

As the turfgrass breeders concluded their 1988 reports, there was obvious enthusiasm. There is growing confidence that this is one research project likely to achieve its objectives. Turfgrasses for golf that will have reduced water requirements and maintenance costs may be a reality in the not too distant future.

Employee Development: Management's Responsibility

by **GREG YOUNGS**

Superintendent, Milwaukee County Parks & Recreation

MILWAUKEE County's Department of Parks, Recreation, and Culture administers to and operates 62 swimming and wading pools, 16 golf courses, 134 tennis courts, nature centers, boat launching sites, marinas, the Mitchell Conservatory, and the Whitnall Botanical Gardens. In all, the park system spans 14,754 acres and encompasses 137 parks and parkways, three beaches, and extensive roadways. Staffing requirements to maintain the park system include 700 full-time employees and 1,200 seasonal or part-time employees. Obviously, it is important that each individual understands his role in achieving department-wide success. But how is success achieved? The answer is through a well-trained work force.

In any large organization, management has a responsibility to provide resources necessary to achieve successful results. However, when budget cuts are mandated, training programs are considered as expendable, and they're the first to go. In Peters and Waterman's book, *In Search of Excellence*, the authors studied private and public organizations in the

United States, and found successful organizations had an obsession with employee training. They concluded that this obsession maximized the organization's productivity, effectiveness, and employee growth levels. Therefore, the training we offer our employees ensures they are aware of what to do, when to do it, and how to do it well.

If an organization properly identifies needs and formulates training programs that address these needs, it can expect positive results for its efforts. These are some examples:

1. Improved employee morale: Proper training reinforces the employee's status as a member of the team, critical to the success of the organization.

2. Increased employee versatility: Employees can fill vacated positions with confidence, because they have a clearer understanding of what is expected.

3. Reduced turnover costs: This is directly associated with lack of training during early employment period. Often, the employee does not understand what is or isn't acceptable job performance, and then, when subsequent disciplinary

action is taken, he is disillusioned and often quits.

4. Less direct supervision: A well-trained staff allows the supervisor to spend time fine tuning the operation.

5. Improved user relations: Proper training equips employees to deal with public inquiries with confidence, relaying information in an intelligent manner.

6. Better utilization of resources: Trained employees take better care of equipment. They handle materials and supplies carefully, avoiding costly mistakes.

7. Improved quality results: The natural outcome of knowing what to do, when to do it, and how to do it well is efficiency.

8. Reduced complaints and grievances: Labor unions and associations expect an organization to provide its employees four things:

- a. Reasonable compensation.
 - b. A safe working environment.
 - c. Proper training to do the job.
 - d. The appropriate tools and materials necessary to complete the assignment.
- Proper training satisfies three of the four.



Author Greg Youngs, on the left, discusses maintenance operations with Bob Stock, golf course superintendent at the Brown Deer Park Golf Course.



The 18th green at the Grant Park Golf Course on Milwaukee's south side. This high and dry course is often the first to be opened for play in the spring.

9. Improved communications: Communication is the key to organizational power. It allows for the exchange of information, vital to organizational success.

10. Fewer accidents and injuries: Effective training programs include safety information that ensures the well-being of the employee.

11. Less downtime: Proper training increases the employee's level of knowledge in areas of procedures, processes, and equipment troubleshooting, keeping the flow of work continuous.

What kind of programs has Milwaukee County developed and how have they proved themselves beneficial to the system, and more specifically, to the operation of 16 golf courses?

A series of training programs has been developed to aid course supervisors in dealing successfully with day-to-day responsibilities. The programs developed through the employee development officer and golf course superintendents center on getting back to the basics. J. Sterling Livingston describes effective employee training as that which is relevant and applicable. A measurable payoff can result over time if organizational support is present and training activities concentrate on these principles. Some of the

programs evolve around the use of outside sources, training manuals, videotapes, formal education, and professional studies.

IN 1985, the department sought the services of a professional golf course architect to evaluate our courses. The architect was asked to prepare improvement plans that would solve many of the physical problems that plague our courses. At present the system has seven redevelopment plans, and is currently making recommendations to the county board for support.

This may not seem like a training activity, but the recommendations supported the course supervisors' beliefs and left them more confident in their own evaluations. Also, during the formulation of the plans, course supervisors took an active role in discussions with the architect.

Danny Quast, a highly successful golf course superintendent, led an in-service turf maintenance training program for county park employees. Included in the schooling were course supervisors and lead laborers. The inclusion of the laborers made them feel important to the

operation, and it was fascinating to see that most of the questions came from laborers in each class. Supervisors reported that participating laborers asked more questions and showed more interest during the subsequent golf season.

In 1988, Milwaukee County subscribed to the USGA for the Turf Advisory Service to analyze our methods and philosophies. In most cases, the TAS report validated practices and offered suggestions for improving the maintenance of golf course facilities. The TAS adds credibility to the system and supports the course supervisors' approach to the complex field of turf management.

Even the PGA has entered the picture. The Wisconsin Section of the PGA has been working with management in solving policy problems, developing programs to improve service, and then working with supervision to implement the program. The organization has also been instrumental in evaluating the playability of our facilities.

Supervisors at first were reluctant to deal with the PGA for fear of leasing facilities, but once the fears were eliminated and supervisors understood the organization was another resource of



A view of the Brown Deer Park Golf Course. This north-side course has been the site of three USGA Public Links Championships.

help to them, a more cooperative effort has taken effect.

THE DEPARTMENT is subject to following the policies initiated by the county board. Obviously it is concerned with the safety of citizens and employees alike. In Milwaukee County, as well as in other communities, pesticides are a continuous hot issue. To that end the parks department has requested that any employee handling pesticide materials be licensed by the state of Wisconsin. Additionally, a pesticide manual has been developed that contains specimen labels, employees' right-to-know law, MSDS, and a safety check sheet that is reviewed by the supervisor and applicator. The manual satisfies the ordinances and policies of the county board, and goes well beyond the state's mandated requirements. The manual gives all the necessary information to the employee, thus eliminating the fear associated with pesticide application.

THE DEPARTMENT has made a series of videotapes available to each park region describing equipment maintenance procedures and operation. This

training technique is already paying off. Equipment repairs are down, and routine maintenance is improving. The tapes identify general maintenance items. Training sessions using video programs will soon become a normal routine. Aerifying, cup changing, fertilization techniques, and endless other processes can be filmed for future use and reference. These tapes could be the basis for an entire winter training program. The possibilities are endless.

Course supervisors were paid to attend an intensive turf management program at the University of Wisconsin — Madison. They were asked later to share their information with their peers, having them act as course instructors.

This experience enhanced their confidence as golf course supervisors, using their recently acquired knowledge. One of our employees has even gone on to receive a two-year turf management degree from Rutgers University. To that end, the department made available a leave of absence, thereby keeping employee status intact.

Milwaukee County has also supported active membership in the Wisconsin Golf Course Superintendent's Association, a

body committed to the field of turf management. The involvement with the association has produced a mutual understanding between private and public sectors. The relationship points out the problematic similarities between the two operations.

As indicated before, these programs are only a sample of the possibilities that exist for employee training, but they are programs that Milwaukee County has tried and proved successful.

The point to be made, however, is that these progressive training programs were initiated within the past three years. Why? A philosophical change in administrative thinking.

Department leadership realizes the importance of employee training, and has committed resources to accomplish this goal. Throughout the budget process, training resources were kept intact, and will continue to be a budget item.

Employee training has a high priority in the parks department of Milwaukee County. Management is meeting its responsibility to all parties concerned by providing employee development programs.

FM Radios on the Golf Course: The Next Best Thing to Being Two Places at the Same Time

by **JAMES F. MOORE**

Director, Mid-Continent Region, USGA Green Section

WHETHER you choose to admit it, you live in and are part of a hi-tech society. You can't start your car without activating a series of micro-computers beneath the hood. Remember when your television set was full of vacuum tubes, and how much fun you had with your father testing them on a machine at the drug store? Or how about sitting in a quiet library and suddenly hearing a wide assortment of bells, chimes, and beeps as everyone's digital watch reached the top of the hour?

Well the computers under the hood may baffle you, you may not have looked in the back of your TV lately, and your old Timex may still be merrily ticking away, but even if you are shy of technology, as a golf course superintendent you need to take a hard look at FM two-way radio communication, one of the most useful and sensible hi-tech tools ever introduced to the golf course. Radios are not new to golf course maintenance; they have been around in one form or another for years. In the past, however, they have been inefficient, costly, and bulky. Although they occasionally accomplished their goal of allowing voice communication between two parties, their use was limited to this sole function. If you think this is all radios can do today, you are in for some surprises.

The most obvious application of a radio system on the golf course is helping the superintendent better manage his crew. Piercing whistles and bullhorns have obvious limitations, particularly during the member-guest or club championship. Citizen-band radios occasionally meet this need. Unfortunately, CBs are limited in their range, and are not very portable because they need antennae. There is also the very real problem of unexpected visitors to the channel you may be using. A CB blasting out, "How bout ya, Sugar Bear? You got your ears on?" could really prove embarrassing on ladies' day.

Fortunately, highly compact and portable FM radios have solved these problems and many others. They have plenty of range for the typical golf course.

If communication is necessary over a larger area, the signal can be strengthened by a repeater extending the range to many miles. A repeater is actually an amplifier that takes your transmitted signal, makes it stronger, and re-transmits it to the various receivers on your frequency.

FM systems allow you to communicate privately with your crew since you are assigned your own frequency. They are small and easily carried, with some units being as little as $6 \times 3 \times 1$ inches. They are quickly rechargeable and extremely reliable. And now the really good news — they are finally affordable!

Two types of FM units should be acquired.

1. Base station. This unit is usually the same or similar to the type of FM two-way radio installed in a vehicle. As a base station it is equipped with a dc power supply, an external antenna, and a desk microphone. The base unit is typically installed in the mechanic's area of the shop or in the superintendent's office, if a secretary is employed.

2. Portables. These are the small, handheld units. A minimum configuration for most courses would provide a unit to the superintendent, each assistant superintendent, the irrigation technician, and the mechanic.

A touch keypad for making and receiving telephone calls is a valuable and inexpensive option for the superintendent's unit. Similar in operation to a mobile or cellular car phone, it helps the superintendent stay in touch regardless of his location. This allows him to meet his often conflicting duties of direct supervision of the crew and managerial responsibilities in the office.

The advantages of reliable and immediate communication between the superintendent and the crew are too numerous

to cover fully. Obvious applications include:

1. Testing, repair, and adjustment of the irrigation system.

2. Avoiding lost man-hours due to equipment breakdown.

3. Constant adjustment of the daily maintenance schedule to make the maximum use of available man-hours.

4. The coordination of activities such as tournaments, chemical applications, and special projects.

5. Since the maintenance workers are almost constantly on the course, they are usually close by when an accident or medical emergency occurs. Once equipped with radios, they can quickly summon help.

THE TECHNOLOGY is already available to make FM radio systems work for you and your club in other ways as well as talking to the crew.

Many clubs have installed phones on the course in case of medical emergencies and to prevent long delays between nines as players stop for food and drink. Conventional phone lines require costly installation and often ditching across the golf course.

FM radio call boxes are used on many state highways to aid stranded motorists. Similar units can now be installed on the golf course in various locations, powered either by conventional means or by solar cells, which, of course, eliminate the need to install costly wiring. Access to the call box can be limited by a combination or key lock if necessary.

Many industries use FM voice reporter units to monitor and report on the function of specialized equipment. These units are triggered by an event such as low pressure, high temperature, etc., and a call is made to the portable base station or even a pocket pager. A recorded message is then played announcing the event.

There are many uses for such a system on the golf course — particularly regard-



(Left) The base station is equipped with a desk microphone. Usually it is installed in the mechanics' work area.

(Below left) Portable units let the superintendent almost be in two places at once.

(Below right) The external antenna for an FM system is small, yet it is capable of receiving and transmitting over a large area.



ing the irrigation system. Imagine the savings of water and electricity (as well as turfgrass) that could be realized if the monitor detected power lost from the pumping station. The superintendent would be notified by the voice reporter unit with a message such as "pump station power off."

Since many events can be monitored (each with a specific message), the superintendent could be notified when a low-pressure condition exists (a bad leak), when the irrigation system is activated, or when lightning has knocked the irrigation computer into the twilight zone. A warning that temperatures have dropped

below freezing would allow the superintendent to shut down a planned irrigation cycle and prevent large-scale damage to the course. Intrusion alarms for the maintenance building can also be linked to these units.

I mentioned that two-way FM communication systems are now affordable. Although the prices will vary according to the system you choose and your dealer, listed below are some rough estimates of what you will currently need to spend.

Base station	\$1,000 - \$1,200
(including antenna and desk microphone)	
Superintendent's portable	\$600 - \$700
(with telephone option)	

Crew's portables (each)	\$500 - \$600
Repeater service	\$20 - \$25
(if necessary, per unit per month)	

At first glance, the cost may seem high even though these numbers are significantly lower than they were one or two years ago. Actually, most courses would recover the cost of the system quickly as man-hours are saved and work is carried out more efficiently.

For most golf courses, the year's capital equipment purchases are just around the corner. Give strong consideration to acquiring a two-way FM radio system. It is a purchase you will find well worth the cost.

ALL THINGS CONSIDERED

Why Are Golf Courses Used As Proving Grounds?

by JAMES M. LATHAM

Director, Great Lakes Region, USGA Green Section

THREE GREAT hazards to the job permanence of golf course superintendents are turf field days, product demonstrations, and commercially sponsored research reports. They are usually long on promise and short on permanence. Innovative *features* seem to have replaced effective performance as criteria for evaluating products and procedures. In their haste to produce or publish, both manufacturers and researchers are enticing golf course superintendents to use their courses and money as proving grounds for flashy machines, new but untested cultivars, exotic chemical formulations, or procedures based only on educated guesses. This is not new, but it is a great deal more expensive now than it has been in the past, and it may be straining the professional status of the superintendents as they are seen by their executive officers.

Field days and demonstrations are the media events of the turf world. We are titillated by prototype equipment touted as being second only to perpetual motion and crammed with *features*. *Features* made Edsels appealing. *Features* are the forerunners of the "Oops Kits" inevitably received by purchasers of *Breakthrough Equipment*.

Those well-manicured plots at field days are in the same category, since we seldom learn the maintenance level of the test area before or after the grooming for show and tell. How bad was "moderate discoloration and thinning of the turf"

after chemical treatment, and for how long? How much thatch develops under that beautiful new cultivar? Where did the air in that punched aeration hole come from if a core was not removed? Research of this type requires more than a season or two, and even though progress reports do include disclaimers, they are not strongly stated.

The credibility gap can be closed only by golf course superintendents who ask pointed questions about products and procedures that affect their own credibility with the principals of their organization.

It should not be an affront to ask for performance data on equipment. It should not be an embarrassment to ask who sponsored the research on Miracle products, and the conditions of the test. (It is doubtful that any company-sponsored product has ever been reported to be a total bust.) It should not be out of line to question the methods of research when short-term results are contrary to established principles.

Meeting the challenge of golf turf management today should be enough adventure for anyone. No shortcuts to perfection have withstood the test of time thus far, so it is unlikely this year's Startling Technological Breakthrough will. Field days and demonstrations should be enjoyed like a picnic, and progress reports, like potato chips, should be taken with a grain or two of salt.

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I certify that the statements made by me are correct and complete.

Robert Sommers, Managing Editor



USGA Green Section Educational Session GCSAA International Conference and Show

February 13, 1989, Anaheim, California

Getting It All Together For Another Golf Boom

8:00 - 8:10	A Welcome from the USGA Green Section F. Morgan Taylor, Jr., USGA Executive Committee, and Chairman, Green Section Committee, Hobe Sound, Florida
8:10 - 8:25	Turf Tips of 1988 — Part I Larry Gilhuly, Western Director, Tustin, California John Foy, Southeast Agronomist, Hobe Sound, Florida Tim Moraghan, Agronomist for Championships, Far Hills, New Jersey
8:25 - 8:45	The International Flavor of Golf Course Management John Segui, CGCS, President, GCSAA, Waynesborough Country Club, Berwyn, Pennsylvania
8:45 - 9:15	It's a Matter of Opinion "What They Don't Teach in Turf Schools" James A. Johns, Golf Course Superintendent, Northmoor Country Club, Highland Park, Illinois "Receiving and Disbursing Research Funds" Dr. James R. Watson, Vice President, The Toro Company, Minneapolis, Minnesota "Six Grasses — One Golf Course" Tommy Witt, Golf Course Superintendent, Austin Country Club, Austin, Texas
9:15 - 9:35	Water for Golf Course Use — 1989 and Beyond Dr. Jewell Meyer, Cooperative Extension Service, University of California at Riverside, Riverside, California
9:35	Break
9:45 - 10:00	Turf Tips of 1988 — Part II Paul Vermeulen, Western Agronomist, Tustin, California Stanley J. Zontek, Mid-Atlantic Director, West Chester, Pennsylvania James T. Snow, Northeast Director, Far Hills, New Jersey
10:00 - 10:20	Things To Do Before Contacting A Golf Course Architect Newell Pinch, Chief Executive Officer, Southern California Golf Association, Universal City, California
10:20 - 11:30	Contemporary Golf Course Architecture — Saga or Satire? Frank Hannigan, Senior Executive Director, United States Golf Association, Far Hills, New Jersey Roger Null, CGCS, Norwood Hills Country Club, St. Louis, Missouri Patrick J. Rielly, President, Professional Golfers' Association of America, Annandale Golf Club, Pasadena, California Roger Rulewich, President, American Society of Golf Course Architects, Montclair, New Jersey
11:30 - 11:45	Turf Tips of 1988 — Part III James F. Moore, Mid-Continent Director, Waco, Texas Patrick M. O'Brien, Southeast Director, Athens, Georgia James M. Latham, Great Lakes Director, Brown Deer, Wisconsin
11:45 - 11:50	Closing Remarks F. Morgan Taylor, Jr., USGA Executive Committee, and Chairman, Green Section Committee, Hobe Sound, Florida
11:50	Adjourn

TURF TWISTERS

GOLF LIBRARIES & MUSEUMS

Question: I recently visited the USGA headquarters in New Jersey and enjoyed browsing through the library and museum. Are there other public facilities in the country that feature a golf library and memorabilia? (Utah)

Answer: The Ralph W. Miller Golf Library and Museum is located at the Industry Hills Recreation and Conference Center, in the City of Industry, California. It includes a large collection of valuable old clubs and golf-related items, artwork, photographs, history, and an extensive library, which includes books on golf course maintenance, turfgrass science, and course architecture. If you plan to attend the GCSAA International Turfgrass Conference and Show, February 6-13, 1989, in Anaheim, California, a side trip to Industry Hills (about an hour) will be worth the effort. For further information call (818) 965-0861, ext. 1258.

OFFER A FREE SPOT

Question: Are USGA greens ever "soilless greens"? I have heard that mixes of sand and peat alone (without any soil added) have met USGA Specifications. Is this true? I think I would like some soil in my new greens. (Ohio)

Answer: *Sometimes* soil testing labs do recommend sand and fibrous organic matter alone in blending topmixes meeting USGA Specs. *However*, this does not mean it does not contain 'soil.' In fact, it *must* contain some percentages of clay and silt to aid in base exchange and nutrient retention. Most sands (even washed sands) contain some silt and clay as natural contaminants. Also, almost all organic matter (especially bog peats and humuses) contain some silt and clay. Therefore, you do have percentages of silt and clay, free of charge. Thus, sand/peat greens are not soilless greens. This is why a good soil testing laboratory and good information are essential when blending modern topmixes or topdressings to meet today's demands.

YOU MAY SAVE A LITTLE — BUT LOSE A LOT!

Question: Is there any danger in using "ag" chemicals in place of those with turf labels as long as the active ingredient is exactly the same? They are almost always cheaper, and therefore more available to clubs with small budgets. (Oklahoma)

Answer: There are two very significant dangers. First, even though the active ingredient may be the same, there is often a large difference in the type of carrier used in blending. Many "ag" chemicals use petroleum-base carriers that can be quite harsh on turfgrasses.

Second, regardless of the suitability of the "ag" chemical, you are using an illegal chemical if it is not specifically labeled for turf. Doing so places you and your club in a position of significant liability. The initial savings in product cost may be lost hundreds of times over in legal fees and penalties. If your club cannot afford to buy labeled products, it can by no means afford the risk of illegal substitutes.