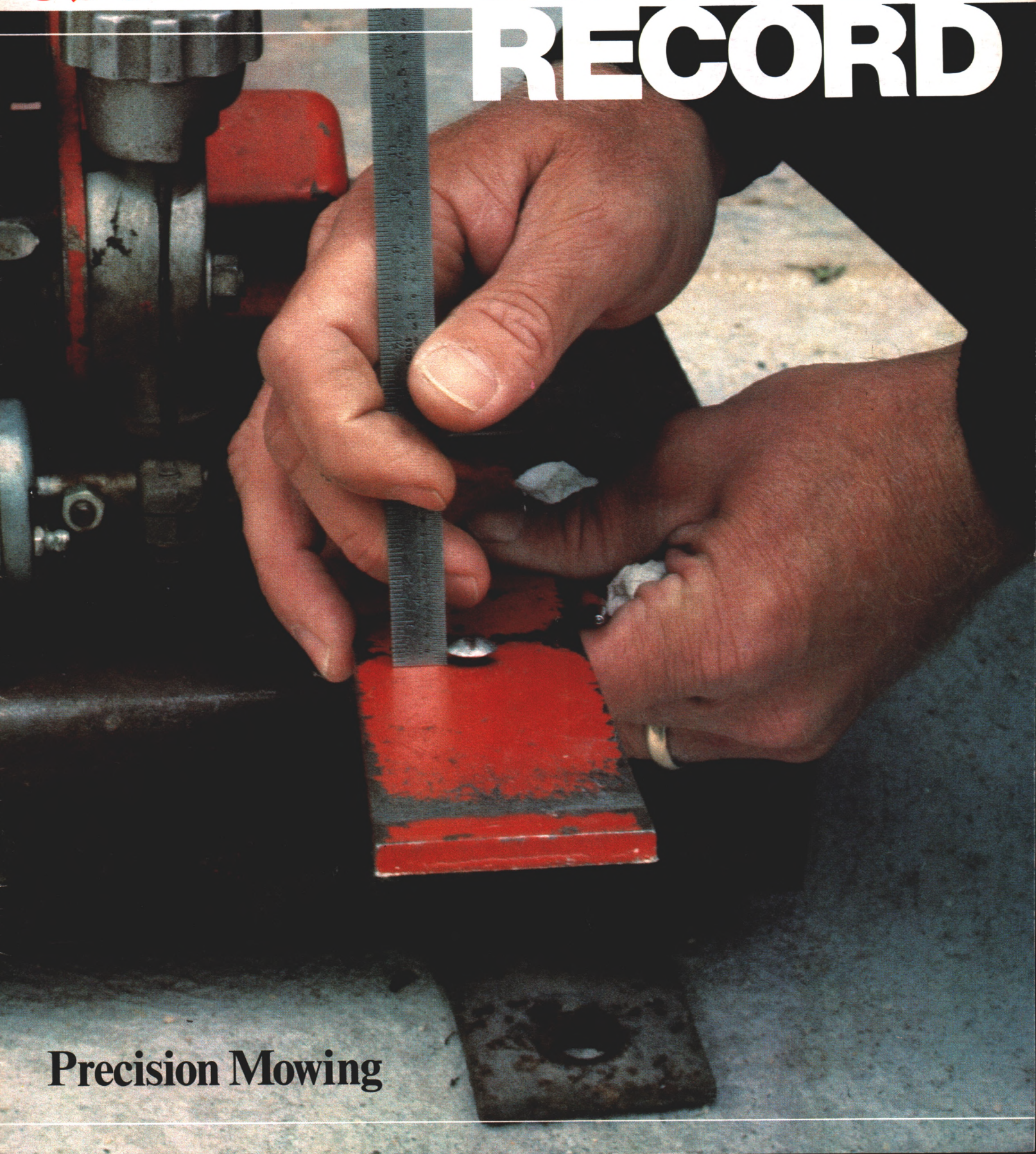
A Publication on
Turf Management by the
United States Golf Association

July/August 1979

USGA Green Section RECORD



Precision Mowing

USGA

Green Section RECORD

EDITOR:
Alexander M. Radko
MANAGING EDITOR:
Robert Sommers
ART EDITOR:
Miss Janet Seagle

VOL. 17, No. 4
JULY/AUGUST 1979

Cover Photo:
Superintendent Faust uses a metal rule graduated to 64th's of an inch to check his bench setting. Bench setting during the 1977 U.S. Open Championship was 5/64".

GREEN SECTION RECORD (ISSN 0041-5502) is published six times a year in January, March, May, July, September and November by the UNITED STATES GOLF ASSOCIATION, Golf House, Far Hills, N.J. 07931. Subscriptions and address changes should be sent to the above address. Articles, photographs, and correspondence relevant to published material should be addressed to: United States Golf Association Green Section, Golf House, Far Hills, N.J. 07931. Second class postage paid at Far Hills, N.J., and other locations. Office of Publication, Golf House, Far Hills, N.J. 07931. **Subscriptions $3 a year.**

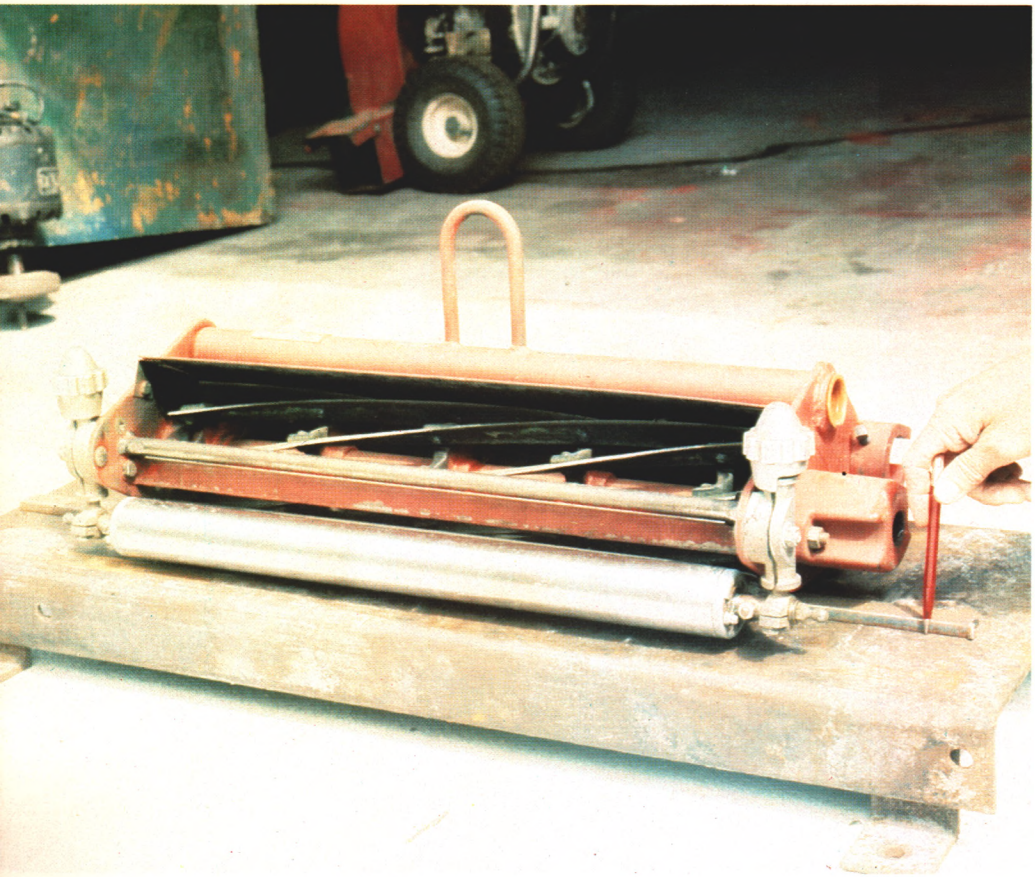
Mechanic James Ames uses a hand grinder to taper front edge of bedknife.

Putting Greens– The Height of Cut

by DONALD D. HOOS and WOODROW W. FAUST

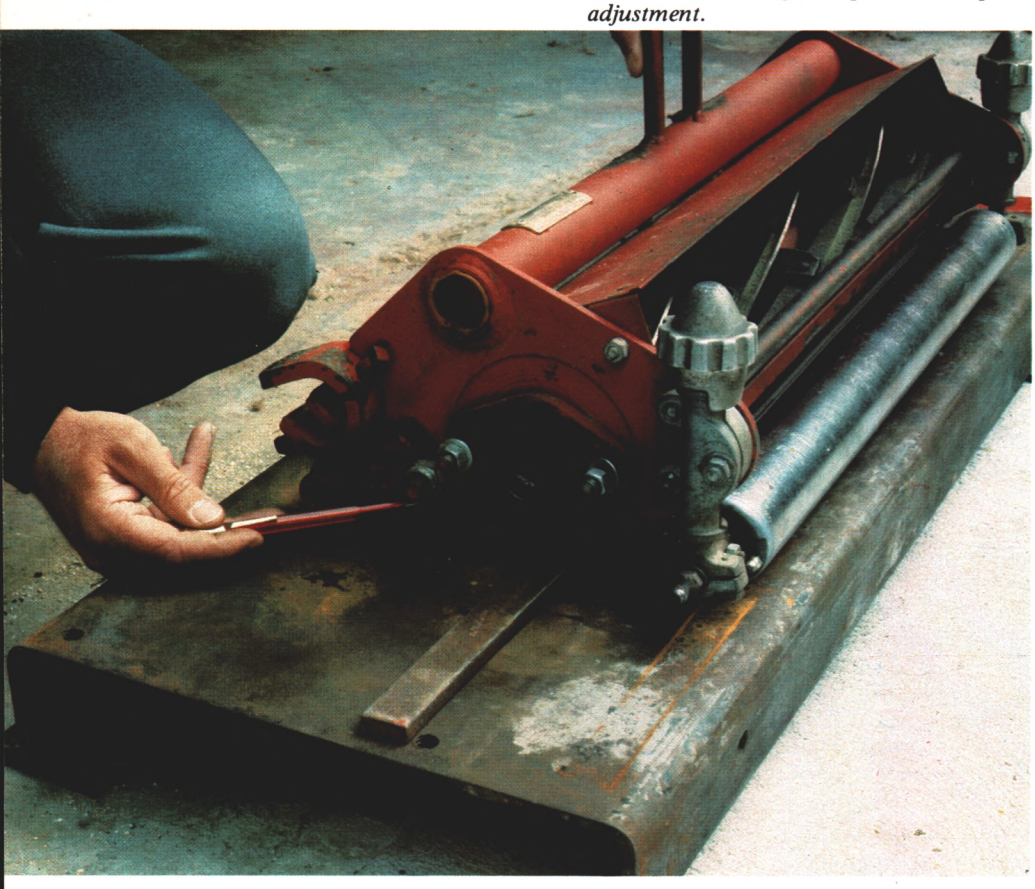
WHEN THE 1977 U.S. Open Championship was played at Southern Hills Country Club, in Tulsa, Oklahoma, and USGA officials became aware that greens were cut with a triplex mower, they were immediately concerned that greens would not meet championship speed standards normal for USGA competitions. For its championships, the USGA recommends that greens be mowed at a height that will insure a minimum speed of 8 feet 6 inches measured by the USGA's Stimpmeter. On a triplex mower, this requires a bench setting of less than 3/16 of an inch. It is not easy to set a triplex mower to provide a true field cut of 3/16 of an inch or less, because the triplex, due to its floating heads feature, mows 1/16 inch higher than a rigid single unit set at the same bench height. The choice of bedknives also helps determine the true height of putting green cut. There are two: one is the standard (regular) bedknife, while the other is the championship (thin) bedknife. There is a minimum difference in thickness of 1/16 inch between the standard

DONALD D. HOOS is Director, Western Region, USGA Green Section. WOODROW W. FAUST is golf course superintendent, Southern Hills Country Club, Tulsa, Oklahoma.



(Above) Note the steel platform and the metal bar, 1/4 inch thick, which is placed beneath reel to insure the reel and rear roller are squarely aligned.

(Below) Point of rear roller where adjustment is made to insure that rear roller and reel are squarely aligned. Sometimes the slot has to be enlarged to provide adequate adjustment.



(regular) and championship (thin) bedknives. Therefore, it is possible for two putting green mowers to be set at the same bench height, yet the true field cut could vary by approximately 1/8 of an inch. When you consider that an adjustment of 1/64 of an inch makes a marked difference in putting green speed, it is readily evident what a difference an added eighth of an inch will have on putting quality. Putting green grasses must be mowed at a true field cut of 1/4 inch or less to provide quality putting surfaces.

A number of factors influence the end result, aside from the mower setting. Some of the major factors are as follows:

(1) The specific variety of bentgrass or bermudagrass selected as the putting green cover. Good putting green grasses demand close cut. Even the best varieties make poor putting surfaces when they are not mowed tight.

(2) Putting green grasses require close, frequent mowing — every day of the growing season.

(3) A good operator for every putting green mower.

(4) Excellent putting surfaces receive minimal amounts of fertilizer. Greens that are heavily fertilized generally make poorer putting surfaces than greens fed lightly, as needed.

(5) Excellent putting surfaces require excellence in water management. Usually this means reducing the amount of water to a minimum . . . to only slightly more than enough to keep them alive . . . and watering each green uniformly.

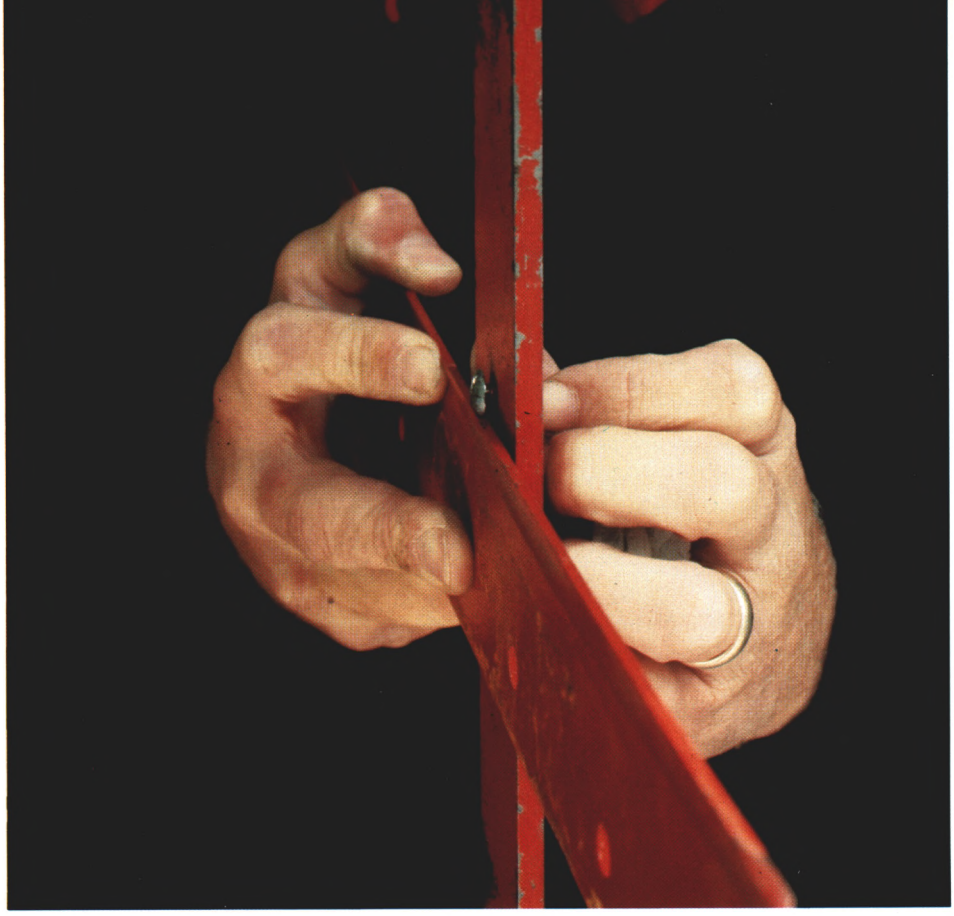
(6) Excellent greens require a well-rounded preventive pesticide program to combat weeds, diseases and insects.

(7) Excellent greens require a good topdressing program using material that is compatible with the soil mixture presently under greens.

(8) Thatch must be minimal, ½ inch or slightly less to provide good health and proper resiliency.

(9) Various kinds of mechanical devices that attach to mowers or are used separately also affect the true field cut of putting surfaces. These are rollers, combs and brushes, vertical mowers, spikers, aerators, thatchers, etc.

Putting green quality is the sum total of all these factors meshed into a program directed by the golf course superintendent. How were the greens



at Southern Hills conditioned to attain an average field speed of more than 9 feet for the 77th U.S. Open Championship using a triplex mower? The following interview took place during a visit to Southern Hills:

Hoos: What steps and checks do you go through to assure that the mower is cutting at the height you want?

Faust and Mechanic Ames: We believe the key to accurate mower setting is to be certain that the back roller and the reel are squarely aligned. The key to insuring this is

(Left) Regular bedknife that is not tapered is thicker than the height of cut used at Southern Hills and will not fit under bolt of adjusting bar.

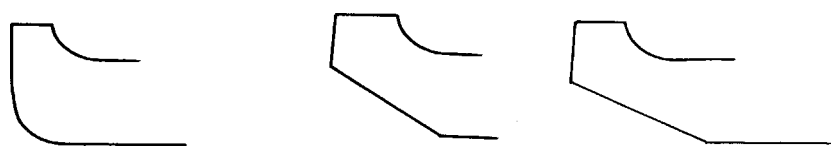
(Below) Superintendent Sonny Faust checks bench setting and condition of mowing unit before it is attached to greens mower.

proper adjustment on a platform that is level. A regular workbench is not satisfactory for making this check. We use a flat piece of steel that we know is not warped. A ¼-inch flat steel rod is then placed beneath the reel, and the back roller is then positioned so that the mowing unit is sitting squarely on the steel platform.

If the reel is square with the back roller, then even if the reels are slightly cone-shaped they will still cut at the same height, because you have adjusted out the differences when you square the roller and the reel.

After the reel is ground and adjusted to the back roller, the next major step is to grind down the front face of the underside of the bedknife. The mechanic should use a hand grinder for this operation. He should start just in front of the screw holes and taper the bedknife to the front. He starts with thin bedknives and makes them thinner.

Figure 1.



REGULAR OR STANDARD BEDKNIFE | THIN OR CHAMPIONSHIP BEDKNIFE | SOUTHERN HILLS BEDKNIFE AFTER GRINDING

After this is done the height of cut is set the same as on any greens mower.

Hoos: What is the thickness of the bedknife you use? Do you grind it down before you put it on the mower?

Faust: The thickness of the front edge of a championship bedknife is approximately 5/64 of an inch. Using a hand grinder to taper the bedknife, after grinding, the front edge is about 4/64 of an inch.

Hoos: Are all bedknives uniform in thickness?

Fuast: No, they are not uniform in thickness or shape. A regular bedknife has no taper on the front edge. A thin bedknife or championship bedknife has a small taper behind the front edge. It is up to us to make necessary adjustments when new bedknives are received from the manufacturer.

Hoos: How long does a bedknife last?

Faust: About six weeks under normal conditions and less than that after topdressing or aerifying.

Hoos: Is it difficult to adjust each of the three mowers to cut a uniform height?

Ames: No, but the same person needs to adjust the height on each unit. Different people will adjust the unit to a different feel. One person might set the height of adjustment bar tightly against the rollers and another person might set it loosely, therefore the same person should adjust all units. Once on the mower, all units will cut the same because of the floating head action of the mowers. The only difficulty occurred when it was found that the units sometimes did not turn fast enough. Therefore, it is important to use a tachometer to make sure the engine is turning at the recommended revolutions per minute. The best engine speed is a minimum of 3,800 rpm for normal operation, which is the manufacturer's recommendation. During the Open Championship we found it better to accelerate to 4,200 rpm, but this was only for a short period of time. Continued operation at this speed would damage the equipment.

Hoos: What was the gauge setting used for cutting greens during the Open Championship in 1977?

Faust: Five sixty-fourths of an inch.

Hoos: How often were the greens cut during the week of the Open? When did you begin mowing at this height?

Faust: The maintenance program before the Open began with aeration and topdressing during the first part of March.* Then at three-week intervals the greens were topdressed with sand and verticut lightly. The last topdressing was the Thursday of the week before the championship. Greens were mowed at 3/32 of an inch until two weeks prior to the tournament when they were lowered to 5/64 of an inch, and were double mowed beginning one week prior to and for each day of the tournament. For normal operation the greens at Southern Hills are mowed at 6/64 of an inch.

Preparation for the Open Championship was not unusual. The only thing extra or unusual was double mowing the greens each day. We normally do not do this. We use a light sand topdressing program at three- to four-week intervals as part of our normal maintenance program.

Our mechanic, Mr. Ames, normally back-laps the mowing units once a week; he is very precise and professional. As you can see from the pictures, the mower will cut paper across the entire length of the reel-bedknife contact. It is very important to have sharp mowers to produce a high-quality cut when mowing at precise heights below ¼ inch.

By grinding the thin bedknife, we can lower the mower to almost 2/32 of an inch before the bedknife is resting on the ground.

After the initial setup of a unit, which involves several hours of work, subsequent adjustments are not difficult and the height of adjustment normally takes about 20 minutes per mowing unit.

Another important key to proper adjustment is that all changes in mower height are made with units off the mower and positioned on a steel platform where the mechanic can see what he is doing. After adjustment, the mower is field-tested to see if it is cutting at the desired height. If the grass does not look tight enough, then the unit is carefully adjusted until it does.

Greens are the most important playing areas on the golf course. They are costly to maintain. Proper mower setting is a small but very important part of putting green management.

*Normally, the USGA recommends that greens not be aerated in spring prior to the Open Championship, but growing bentgrass in Oklahoma weather required it be done, otherwise the turf would suffer undue stress in summer.

Golf Course Aviary and Animal Problems

by CARL H. SCHWARTZKOPF
Director, North-Central Region, USGA Green Section

ALLIGATORS, armadillos, beaver, badger, 'coon, coots, dogs, deer. Sounds more like roll call at the zoo parade than creatures that often pose problems on the golf course. Normally, when club officials and superintendents discuss golf course problems, they refer principally to insects and disease or the growth of weeds. Animals on many golf courses, however, are real problems to people who maintain them and to people who play.

Damage from animals occurs in various forms, depending upon their numbers and the frequency and intensity of the visits they make searching for food. Flocks of birds can severely limit the effectiveness of an overseeding program by eating newly sown seed and young seedling plants as they emerge. Migrating water fowl have also been seen causing considerable damage to fairways by completely denuding areas of turf. Seagulls, coots, crows and starlings are the most frequent and troublesome insect predators. Although deer, by virtue of their gentle grace and beauty, add to the pleasantness of the environment, they, too, create some problems, especially in areas where the winters are snowy. Deer often ruin small trees by scraping their antlers along the trunk to remove moss and other growth. They sometimes eat all the growth they can reach on small trees. Gophers and other burrowing animals create holes that may cause the golfer to twist an ankle or lose a golf ball. A ball lost is not serious, but a turned ankle may be. Mice, rabbits and other rodents can severely damage turf during winter. These small creatures can even kill trees by feeding on the bark at the base of the tree.

To cope with the damage that animals can do, various means of control have been developed. Some golf course superintendents have used homespun ingenuity in coping with these problems, whereas others rely upon commercially recommended products.

Deer grazing on the front lawn of the Wawona Golf Club, Yosemite National Park, California.

The turf damage caused by birds generally occurs when they are feeding on worms, grubs, young seedlings or newly sown seed. Some golf courses have been able to frighten birds away by using automatic exploding devices and sound generators. Both the frequency of the explosion and the volume can be adjusted. One golf course reported effective seagull control by assigning someone to fire a shotgun into the air at irregular intervals and just before the birds attempted to land. Using sound-deterrent devices can be effective not only for bird control but also for most other animals. One problem that can limit the use of loud and explosive noises is the annoyance caused to nearby residents and the obvious disturbance to players.

Visual methods of frightening birds can also be used. These include scarecrows, metal pie plates and other homemade devices that create constant motion and clatter. Some orchard growers have been able to chase birds away by placing imitation snakes in the trees. Brightly colored plastic or rubber snakes discourage birds from feeding. It is possible, occasionally, to use other natural deterrents to discourage bird activity. For example, birds were feeding or resting under the eaves of a clubhouse in the Pacific Northwest. By placing an imitation owl under the rafters, the birds were discouraged from occupying the area. Falcons can be used to discourage coots. The falcon flies over the area, the pesky coots become scared, and they relocate. A combination of the sound devices along with natural predator control is likely to give better results than just one of these techniques.

Should it be difficult to obtain satisfactory control with biological or mechanical means, it is possible to use a chemical approach. A chemical method of bird control has become available. After ingesting a small amount, this chemical produces an alarming reaction; first the taste is extremely unpleasant and soon thereafter a tightening of its throat muscles creates a touch of panic. This reaction is usually enough to cause the bird to stop eating and leave the area. Fortunately, this chemical reaction is reversible within 45 minutes.

Under a thick snow cover during the winter, mice can damage turf. They can also girdle and damage trees by feeding on the bark. Mice can be controlled by applying a toxic-coated grain, bait or other compound around the base of young trees. The mice die shortly after they eat the treated grain or bait.

(Below) Rabbits feed on young tree bark.

Rabbits also can be very damaging to newly planted trees when they are pressed to find food when snow cover is deep and long-lasting. Rabbits and other rodents have been known to destroy young trees by completely removing the bark at their base. The use of the fungicide material Thiram has been effective as a taste repellent in discouraging rabbits and other rodents from feeding on trees, shrubs and bushes. The Thiram-based formulations will last for approximately one to three months, possibly longer when they are used in conjunction with a spreader sticker. Some commercially available materials are also reported to be successful for repelling deer.

Plastic tree guards, poultry netting or wire fences placed around trees have been effective in discouraging animals from feeding on the bark of trees. Recently, ultrasonic rodent repellers have become available. They produce a high-frequency sound (inaudible to humans) at a high volume. Mice, rabbits and other rodents are repelled, but these instruments have limited range.

To discourage deer, numerous chemical repellents are available commercially. In addition, many superintendents have formulated their own repellent. This includes mixing a tablespoon or two of Tabasco or Louisiana Hot Sauce with one tablespoon of an anti-desiccant in a gallon of water. This material can be sprayed on the trees to discourage summer browsing. Deer apparently dislike the hot, tangy taste. A similar mixture with twice the amount of anti-desiccant has been used to discourage mice and rabbits from girdling trees and bushes. This solution must be applied when temperatures are above 40° F.

Another method for discouraging deer has been to use felt strips treated with creosote about ½ inch wide by 6 inches long. One or two strips of the treated felt are hung on the tree at a height of about 30 to 40 inches. During rainy weather, these strips will have to be retreated approximately every three weeks. However, one application could last through the winter. Since creosote will burn the leaves and bark, they should be hung where it will not drip onto the foliage or wood.

Small cloth bags filled with two or three teaspoons of tankage or blood meal have been hung in trees to repel deer. The odor repels deer for about four months, but it is ineffective in

(Left) Beaver can destroy large trees.

(Below) Field mice feed on grass under snow in winter.

Decoy predators are sometimes effective in keeping pesky birds from buildings.

winter. A second problem with use of this technique is that quizzical animals are attracted to the tankage and quickly destroy the bags. As a result, this procedure has limited use.

Hanging small bags of strong, offensive material in trees is apparently a popular way of repelling deer. Everything from urea fertilizer to moth balls has been hung in trees. Since the deer is a protected game species and several states have programs to increase the deer population, some who continually experience damage from deer feel that the government should provide assistance with problems that deer cause.

In areas where snow cover is not a problem, some superintendents have reported favorable results by discouraging deer and elk from foraging in their fairway areas by letting the rough grow longer. When long, succulent grass is available, the deer and elk usually confine their feeding primarily to those areas.

Other problems on the golf course include the damage that muskrats and beavers do to the shoreline of ponds and streams. Since the fishery and wildlife laws vary considerably from state to state, it is important to contact the local authorities for guidance and assistance with such problems. In many instances, the state fish and wildlife officials will assist in trapping these animals for relocation.

In turfgrass areas where high grub and insect populations occur, skunks, racoons, moles and armadillos can destroy turf by digging and scraping to feed on the grubs. By applying an insecticide for the eradication and control of the grubs, it is possible to discourage the animals from feeding in those areas. Where grub control is ineffective, it is advisable to contact local conservation officials for assistance in trapping and relocating troublesome animals.

The presence of wildlife on the golf course can definitely be considered desirable until their populations reach such proportions that turf and trees suffer frequent damage. The use of natural predators or decoys has been more effective to date than the use of toxic baits and chemicals.

Editor's Note: Ken Stohl, former superintendent at Orinda Country Club in Orinda, California, has reported that applying a diluted solution of asphalt-based grafting wax to the trunks of young trees will discourage gophers and other rodents from feeding on tender bark. It sets up quickly in warm weather, but it doesn't become hard or brittle. Stohl suggests two applications for best results.

Penneagle Creeping Bentgrass

by DR. J. M. DUICH

USGA, GREEN SECTION funding of a bentgrass breeding program at Pennsylvania State University, University Park, Pennsylvania, has substantially aided the development of a new seeded variety — Penneagle Creeping Bentgrass. In addition, Green Section personnel were involved in its golf course testing and have been selecting promising material for fairway bent improvements in progress.

Penneagle, tested as PSU-PBCB, was developed in its present form with the main objectives being a broad genetic base without gross segregation, putting green quality, vigor to compete favorably with annual bluegrass, *Poa annua*, but curtailed compared to Penncross, favorable disease resistance, and good commercial seed yields.

The program was initiated in 1958 using a pool of 156 vegetative bent lines on which turf performance was available for up to 15 years. From this group, 21 lines were selected and vegetatively planted for seed production and crossing data in an 18-replication top-cross nursery. Following initial seed harvest, 16 of the original 21 were planted for turf testing. Replicated trials were maintained at 3/16- and 1/2-inch cutting heights, and two nitrogen levels to screen for turf quality and excessive vigor types.

Penneagle under southern testing on greens on Augusta National Par-3 course.

A GREEN SECTION SUPPORTED RESEARCH PROJECT

Penneagle mowed at 1/8 inch. Stimpmeter speed 9 feet, 6 inches.

Based on three-year screening, seven lines showed promise compared to Penncross and Seaside, the commercial checks.

Combinations of the seven lines were grown in Oregon and at Penn State. Component and polycross seed lines were further tested at University Park, and in cooperation with golf course superintendents in Pennsylvania, Ohio, Illinois and North Carolina. Based on performance, a four-

TABLE 1

Origin of Four Parental Clones of Penneagle Bentgrass

Parent	Origin
No. 1 —	3rd generation selection from 1938 Washington bent.
No. 2 —	3rd generation selection from 1930 Seaside bent.
No. 3 —	3rd generation selection from 1932 Cocoos bent.
No. 4 —	2nd generation selection from 1933 Washington bent.

TABLE 2

1965 Bentgrass Variety Trial. Average Annual Turf Quality and Disease Data for Seeded and Vegetative Bents, 1966-77. University Park, Pa.

Seeded	Turf Quality	% Poa	Dollarspot Per Sq. Ft.	Snowmold	Red Leafspot	Brownpatch
Penneagle	8.9*	1.0	4.2	2.0**	1.1**	1.1**
Seaside	5.2	18.8	7.8	2.7	3.6	4.3
Penncross	8.6	1.2	20.2	2.1	2.2	1.5
PSU-F	8.6	1.0	6.5	0.9	3.5	1.5
PSU-J	8.3	4.0	11.0	1.9	1.3	2.1
Vegetative						
Arlington	5.8	15.4	4.5	3.2	3.7	2.2
PSU-101	6.0	16.0	7.5	3.8	4.2	3.3
PSU-102	7.1	7.4	4.5	5.7	1.7	1.5
PSU-103	6.3	13.2	6.2	4.8	1.6	3.0
PSU-104	7.8	7.4	30.2	3.6	3.2	4.3
PSU-105	6.5	19.0	4.7	1.7	3.4	1.5
PSU-106	8.3	16.0	4.0	1.3	1.9	1.1
Pennpar	7.5	20.0	4.7	1.7	3.7	1.0
PSU-107	8.6	6.2	2.5	1.9	1.0	1.3
Congressional	5.8	30.2	8.2	0.7	4.2	3.0
Cohansey	6.9	19.4	49.5	2.3	4.9	4.0
PSU-108	7.5	3.0	2.5	1.6	0.8	1.0
Nimisilla	7.5	5.8	5.8	5.1	2.7	3.3

*Scale: 0 to 10, 10 = best **0 to 10, 10 = most

parent polycross combination (Table 1), PBCB, was planted in the 1965 Bent Evaluation Test. One parent was later changed based on further Oregon anthesis (pollination) data.

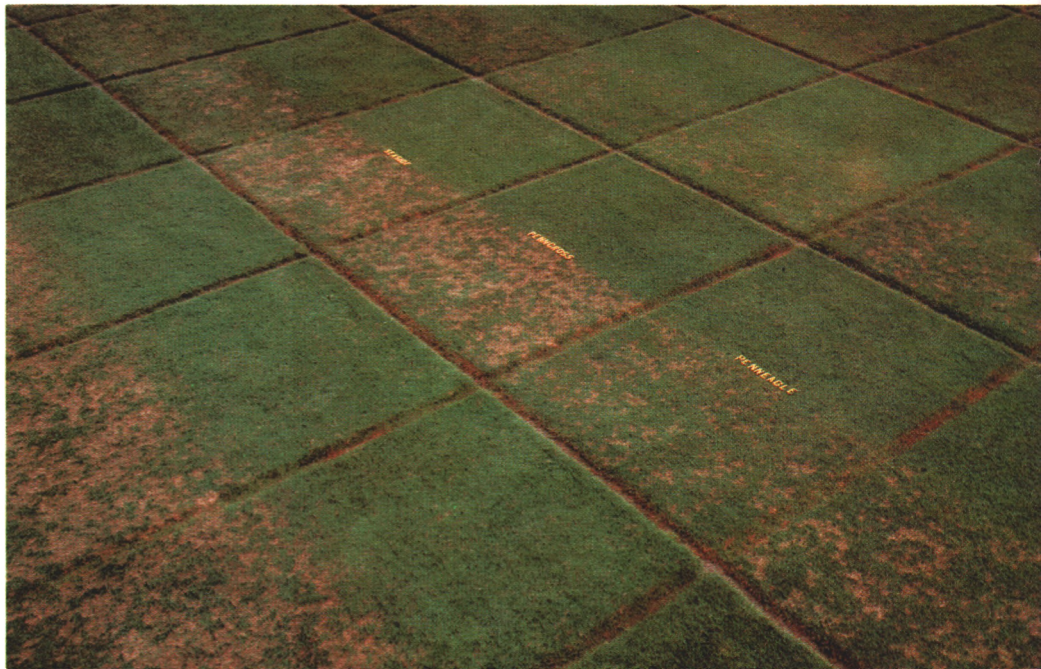
Long-term test performance data are shown in Table 2 comparing five seeded and 13 vegetative entries. Penneagle consistently produced the top turf quality, resisted *Poa annua* invasion, and provided a high level of resistance to common turf pathogens, including several races of leafspot and dollarspot. Other University Park tests have confirmed the improved performance of Penneagle for withstanding *Poa* invasion, earlier spring greenup and superior low nitrogen performance.

Since 1974, over 2,200 pounds of seed have been distributed to nearly 100 golf courses and stations in the United States, Canada, England, Mexico and South Africa. In addition to two 18-hole courses and four nine-hole additions, golf courses have used seed for nursery trials, practice greens, tees and reseeding of greens, tees and fairways. No negative performance reports were received, other than failures to establish successfully. Use of new greens in approximately six weeks was reported by several cooperators.

Based on experimental and practical use information, PSU-PBCB was formally released as Penneagle bentgrass on August 8, 1978, by the Pennsylvania Agricultural Experiment Station. Penneagle is a registered variety under the U.S. Plant Variety Protection Act and available commercially as certified seed only.

The development of this variety is another example of Better Golf Through Research, as supported through research grants of the USGA in continued cooperation with land grant experiment stations of various state universities.

J. M. DUICH is Professor of Turfgrass Science, The Pennsylvania State University.

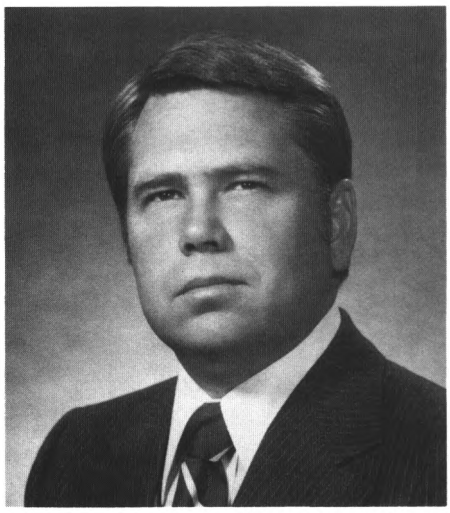


(Top) Varietal difference to Poa annua *invasion in four-year stand. Penneagle vs. Emerald.*

(Center) Varietal response to low nitrogen, three pounds annually. Left, Seaside; center, Penneagle; right, Penncross.

(Right) Fairway tests. Left, Seaside; center, Penncross; right, Penneagle.

"Mr. Green Committee Chairman"



Paul D. Cato, Jr.

by PAUL D. CATO, JR.
President, Colonial Country Club, Fort Worth, Texas

FOR THE LAST three years, I have been green committee chairman at Colonial Country Club, in Fort Worth, Texas, the home of the Colonial National Invitation Tournament. This is a golf-oriented club, with over 40,000 rounds played each year. Golf has been good to Colonial, and the Board feels strongly about the continued improvement of the course. Over the last three years, more than $400,000 has been spent on golf course improvements, including a new automatic irrigation system and pump station, a new and efficient maintenance building, a new 10,000 square foot putting green, a new design and construction of the par 3, 13th hole, a new 16,000 square foot bentgrass nursery, and all our asphalt cart paths were relocated and replaced with concrete.

In 1977, Paul Cano, our golf course superintendent, retired after a 42-year career at Colonial. Replacing him was very difficult, but during this process I gained tremendous respect for the profession of golf course superintendents. We interviewed several men for the job, and I can truthfully say that every applicant was extremely qualified, proud of his profession, and interested in improving himself. With this background and experience I do not consider myself an expert, but I have learned just enough to develop some opinions. So the following thoughts are the way I see it as *Mr. Green Committee Chairman.*

Most clubs are judged by their golf course, its layout and condition. Country clubs were created primarily for golf, and members need to understand the importance of their golf course. If it were not for the course, the clubhouse, tennis courts and swimming pool would probably not have been built. It follows that the green committee should be one of the most important and most active in the club. With this understanding, it puts great importance on the selection of a green committee chairman. In my opinion, a chairman should meet the following qualifications:

1. He must be an active golfer (not necessarily a low handicapper) and enough a student of the game to have a working knowledge of the Rules of Golf.

2. He must be a fair, understanding and flexible person who has enough maturity and self discipline to recognize that he is not an agronomist.

3. He must be a man who has easy access to the Board of the club, probably as a member of the Board. This enables the Board to be kept up-to-date and to be in a position to understand and explain the activities on the course to members. An informed Board is easier to sell on budget or the need for additional capital expenditures.

4. He must be a man who has time to give to the job and a great pride in the golf course.

The other committee members should be basically like the chairman. They need to be chosen by the chairman, or at least approved by him. The committee must have very good communications. I recommend a small committee, three people or less, and in many cases only a chairman without a committee. Meetings with the superintendent are held at all times in many places, and this makes getting a large committee together very difficult. The chairman and superintendent should have regular meetings while they inspect the course.

The green committee chairman should help the superintendent with his budget and with policymaking problems. The green committee chair-

man has a good feel for the pulse of the club's thinking and of its financial condition. He should work closely with both operating and capital expenditure budgets. The operating budget should be updated every six months to better relate to the changes constantly occurring on the course. Most of these changes will be in labor, since this makes up about 70 percent of the operating budget.

I feel that the large turnover rate in the labor force is a major problem on most golf courses. Part of the reason for the problem is the low wage scale set up by many clubs. It is increasingly difficult to find good men to work the odd hours, often under less than comfortable conditions. You get what you pay for! It is not good business to put expensive equipment and a valuable golf course in the hands of low-priced, unskilled labor. With the equipment technology in the turf industry improving daily, our golf courses should be able to do more with less people, but it will mean that each workman must be better qualified.

When you have good management, you do not have surprises. This is especially true on your capital expenditures. It is essential to have good records on maintenance equipment and to be realistic about its estimated life. Be certain that your Board knows when your large dollar needs will occur. The green committee chairman and superintendent can hurt their credibility with large emergency needs in capital expenditures.

The green committee chairman and his committee should demand a high degree of maintenance on the golf course. The superintendent is responsible for the manner in which the golf course is maintained. He should not have any doubt about what condition the Board and green committee chairman expect. He must know the standard set down by the Board, and along with this responsibility, he must have authority and complete control over his crew and equipment. The green committee chairman and his committee cannot nit-pick the golf course. They must judge the superintendent and his organization on the complete job. The superintendent and his crew must try to view the course and its condition as the green committee chairman and club members see it.

There must be a close relationship between the green committee chairman and the golf committee chairman, just as there should be a close relationship between the superintendent and the golf professional. Communication and mutual respect is essential or the club will be the loser. The superintendent and the golf professional must pursue the same goal — "The playing condition of the golf course!" I strongly recommend that these two men have regular meetings on the course so that each man can better understand the other's problems. A well-informed golf professional can be a great public relations man for the superintendent. I believe that for such things as hole locations, tee marker location, and width of fairways, the superintendent must have the cooperation of the golf shop for the good of the club.

The superintendent must have a calendar of all scheduled golf events

The superintendent must have full schedule of events so there are no surprises.

at the beginning of each year, and course maintenance needs must be considered when making the calendar of events. For instance, it is bad to find the greens aerified the day before a big club tournament, simply because the superintendent wasn't notified. At times of adverse weather, this line of communication is also very important. I feel that the superintendent should have a complete authority over whether golf carts are to be permitted on the course and when play is to be kept off the course because of freeze or frost. Other closings of the course should be by mutual decision of the superintendent and the golf professional. If they don't agree, then the green committee chairman and the golf committee chairman must step in and do what is best for the club. The green committee chairman and superintendent must never forget that the main reason for the golf course is to accommodate the members.

The green committee chairman and superintendent have a commitment to the club to maintain the philosophy and character of the golf course. All major changes must be approved by the Board. The green committee chairman's job is not to rebuild the course the way he wants it. The green committee chairman and superintendent can and must prevent changes such as: the greens changing shape, loss of hole locations, bunker changes in their depth or shape, uncontrolled tree growth, or changing of green contours. I recommend annual photographs of the golf course so that it does not change in front of our eyes without our noticing it. Hiring a qualified golf course architect is often beneficial in maintaining your philosophy in course character. An architect can also be of great assistance in rebuilding and making major changes when they become necessary.

What does a green committee chairman expect from his superintendent?

The superintendent must have confidence in the green committee chairman and he must be extremely loyal to the chairman. The chairman must never hear of something the superintendent says from another source; it must be said directly to the chairman.

The superintendent must be organized, have the ability to handle men, and be tactful enough to handle members. He must have goals, both long and short range. His standards for maintenance should be high, with extreme pride in the golf course. He must be a leader of men and must be able to delegate responsibility.

The superintendent, like the green committee chairman, should play golf and be knowledgeable about the Rules of Golf. He must know how to define the hazards correctly and realize the importance of these hazard lines being maintained. He must have ability as a mechanic, and with his work on budget, planning and purchasing, he needs to be a good businessman.

It goes without saying, but he must be well-founded in principles of agronomy. He must keep abreast of new developments in the industry. The green committee chairman can help by making sure the club sends the superintendent to state and local turfgrass conferences, the annual GCSAA International Turfgrass Conference and Show and the USGA Green Section Annual and Regional Meetings. The superintendent then accepts the responsibility to attend all sessions and gain as much knowledge as possible to bring back to the club and his organization.

The superintendent must have an open mind to the fast changes in the industry. He should also have a good nursery of both his green and fairway grasses where he can experiment before gambling with them on the course. The superintendent cannot be afraid to say, "I don't know," or "I was wrong." Excuses, alibis and blaming others will cause the green committee chairman to lose confidence. No superintendent can afford for this to happen. The industry has a lot of specialists who are willing and able to help, such as the USGA or the outstanding universities in our country. A good superintendent will make use of all technical resources available to him.

As *Mr. Green Committee Chairman*, most of the reward comes in your own mind and the pride you have in the changes, or lack of changes on the golf course . . . and in a member saying, "I have never seen the course in finer condition."

This address was made at the USGA Green Section Regional Conference at Irvine, Texas, in 1978.

News Release

Texas A&M University Agronomist, Dr. James B. Beard, his wife, Harriet, and a former graduate student, Dr. David P. Martin, have been selected as recipients of the 1979 Overly Award for Bibliography in the Agricultural Sciences. This biennial award with a monetary prize is sponsored by the Association of College and Research Libraries of the American Library Association. The Oberly Award recognizes superior achievement in compiling and publishing the *Turfgrass Bibliography — 1672-1972.* The 730-page bibliography was published by the Michigan State University Press in 1977. It contains over 16,000 references listed alphabetically by author, cross indexed on a subject basis containing more than 40,000 entries. The bibliography contains a compilation of scientific, semi-technical, and popular writings covering all phases of turfgrass science, culture, and management. The Oberly Award has been given 25 times since its inception in 1925. Financial assistance in compiling this bibliography was provided by the O. J. Noer Research Foundation, United States Golf Association, Michigan Golf Association, and the Michigan Seniors Golf Association.

Copies of this award-winning bibliography are available from Michigan State University Press, Room 25, Manley Miles Building, 1405 South Harrison Road, East Lansing, Michigan 48824. Price per copy, $35.00. Add 4% tax for Michigan residents.

TURF TWISTERS

CRITICAL

Question: Can I apply limestone at any time of the year? (New Jersey)

Answer: Anytime the ground is firm enough it's safe to apply limestone. Most superintendents, however, prefer to apply it in spring or late fall, when it is convenient to their schedule . . . when more critical management practices are completed. One caution — pulverized limestone applied at heavy rates, one ton or more per acre, will remain visible on soil and turf for weeks. It tracks and is also visible on golf shoes. Therefore, it is not in the best interests of public relations to apply it when play is at its peak.

IRON PROBLEM

Question: What is the standard rate of iron sulfate for turfgrass use? (Indiana)

Answer: For turfgrasses the standard rate is one to two ounces per 1,000 square feet. Normally, iron sulfate is regularly applied with fungicide sprays on greens and fairways for added color. Iron (ferrous) sulfate restores color quickly when iron is lacking or unavailable to the plant. Iron helps provide color without promoting vigorous growth, which is important during times when weather is touchy to safely apply nitrogen.

To remedy acute iron chlorosis, it is best to apply the sulfate in limited water, two to three gallons per 1,000 square feet when grass blades are dry. Do not water the treatment in. For acute iron chlorosis, two or three ounces of iron sulfate is recommended. When three ounces is applied, the turf may take on a black cast for a day or two. This will disappear with mowing.

CONSULT AN EXPERT

Question: We are having problems with our old irrigation system and would like to consult an expert in this field. Who can we contact? (New Jersey)

Answer: For the names of irrigation engineers in your area, contact:

Irrigation Association
13975 Connecticut Avenue
Silver Spring, MD 20906
Telephone: (301) 871-8188