

MARCH 1976

USGA GREEN SECTION RECORD

A Publication on Turf Management
by the United States Golf Association





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COVER
Dr. James R. Watson, Jr. is the 1976 recipient of the USGA Green Section Award for Distinguished Service to Golf Through Work With Turfgrass. Shown with Dr. Watson are on the left John L. Crist, Jr., Green Section Committee Chairman and Center, Harton S. Semple, USGA President.

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Getting the Most From the Club Dollar 1976 Green Section Education Conference

Dr. James R. Watson, Jr., receives 16th USGA Green Section Award

Dr. James R. Watson, Jr., of Minneapolis, was present to receive the United States Golf Association's Green Section Award for distinguished service to golf through work with turfgrass. The Award was made at the Association's Annual Conference on Golf Turf Management by Harton S. Semple, of Sewickley, Pa., President of the USGA; John L. Crist, Jr., of Charlotte, N.C., Chairman of the Green Section Committee, and Will F. Nicholson, Jr., of Denver, USGA Executive Committeeman, on January 30, 1976.

Dr. Watson, a leading authority on turfgrasses, is vice-president for customer relations and chief agronomist for the Toro Company. He has conducted research on adaptability of species and strains of turfgrasses, fertilization practices, snowmold prevention techniques for the winter protection of turfgrasses, etc. He was instrumental in organizing The First International Turfgrass Research Conference in 1969 at Harrogate, England.

Dr. Watson developed and released Northland creeping bentgrass which resulted in the cultivar becoming the most widely used bentgrass for greens and tees in the Northern Plains region and the Central Canadian provinces.

Born December 24, 1920, in Leesville, La., Dr. Watson received his bachelor's degree in science at Texas A&M in 1947 and his Ph.D at Pennsylvania State University in 1950.

Before an audience of nearly 600, Dr. Watson accepted the Award by saying:

"As some of you know, I was already deeply indebted to the USGA Green Section. It was a Green Section fellowship which permitted me to do graduate work at Penn State University from 1947 to 1950. If not mistaken, I held the first such fellowship given for work toward an advanced degree. It enabled me to study with a teacher I have always admired and respected, Professor H. Burton Musser. I know the USGA shared that

admiration and respect because it gave the USGA Green Section Award to Professor Musser in 1966. Dr. Fred Grau, who was honored in a similar manner three years later, was the Director of the Green Section at that time. I am equally indebted to him and to Dr. Richard Potts, of Texas A&M University, who sponsored me and who introduced me to Fred.

"At the risk of sounding like a refugee from the movie Oscar awards, I should like to share this moment with some of the people who have made it possible for me to receive this coveted award.

"First, my thanks to Dave Lilly and Dave McLaughlin, the Chairman and the President of the Toro Company. They are good people and they are good people to work for, but even more, they have always been interested in and supportive of work on turfgrasses and involvement in Green Section and other USGA activities.

"I want also to express my appreciation to the members of the Green Section staff. What, other than a humble thank you, can one say to valued friends, associates and colleagues for their confidence. An equally valued association over the past 28 years is my privilege to know and to have known many golf course superintendents—such outstanding and valued men as Eb Steiniger, Joe Valentine, Marshall Farnham, Jim Haines, Leo Feser, Ray Gerber, Sonny DuBose, Dave Mastroleo, and many, many more.

"This opportunity, afforded each of us who share an interest in golf, to maintain contact with colleagues in the field and at our colleges and universities, is more than a privilege; it is a virtual necessity for anyone who wants to function and to grow in our profession.

"And finally, I want to thank my family for the love and understanding they have always shown me: my father, my uncle and aunt, Dr. and Mrs. Henry Dain, and especially my wife, Audrey. She knows that this award is as much hers as it is mine. On behalf of both of us, thanks to all of you."

GOLF '76 — That's the Spirit



by **HAROLD SARGENT**, Golf Professional,
Atlanta Athletic Club, Atlanta, Georgia

I caddied in the 1926 United States Open Championship played at the Scioto Country Club where my father was golf professional. This year, 50 years later, the Open will be played at the Atlanta Athletic Club where I am the golf professional. Over this span I have seen many golf courses; I observed changes in golf course conditions that affect playing this game we all love.

I would like to tell about those changes, and I would like to start just as we would play a round of golf, on the first tee.

Some years ago the teeing area was merely a place to start the hole. I have seen cocoa-mats placed in concrete slabs and called tees. I have seen tees 100 per cent weeds, and the weeds were so tall that the players were delighted to find bare ground, even though it was extremely difficult to get the tee in the hard ground. Many of these were bare because green superintendents were not allowed to remove the trees which were caus-

ing these conditions.

Today, with watered tees and the many new grasses developed for specific conditions, some courses are able to have cups cut in the back of their teeing areas for players to practice putt while waiting to tee off. Yes, today if our players hit a bad tee shot, it is their fault and not the fault of the condition of the tee.

Now, we are in the fairway and what tremendous changes here. Many years ago, before sprinkler systems, summer droughts made playing fairway shots very difficult. Weed control was practically unheard of. Even if there was some grass on the fairway it would be so high that it would almost prohibit good shot control as we know it today. I remember playing in a tournament around 1950 before this particular course had watered fairways. The fairways were mowed very close, and the players could control the spin of the ball. Many compliments were offered because of



Electric fans have been used at greens to create air movement during humid nights.

the condition of the fairways. It is hard to believe they were 100 per cent crabgrass.

You should have seen these fairways in the spring, during a drought, or after the first frost—just bare ground. Some years later, after a sprinkler system was installed, this course had beautiful fairways.

The first attempt at watering fairways that I observed was at Scioto during the 1920s when a championship was scheduled during a summer drought. The fairways were getting quite hard and fast. The club made arrangements with the city of Columbus, Ohio, to use the street cleaning water trucks to water the fairways. You can well imagine the time involved to go around 18 holes, and you can also well imagine how little good this watering did.

The first real watering system I saw was also at Scioto. It consisted of water lines with cut-off valves running down the rough parallel to the fairway. A very crude line of sprinklers was assembled on wheels, pulled by a car into position and then connected to a cut-off valve. The sprinklers were allowed to run for an allotted time and then moved to the next valve. The valves were spaced to overlap the watered areas. This was an improvement over the water trucks, but it was a very inefficient operation by today's standard. Yes, today, under normal conditions, we have beautiful fairways—very tight and cut short. This enables the players to execute the great shots we have become accustomed to seeing.

My first recollection of rough was during the 1926 Open; I lost the first ball my brother hit in this Championship. You can well imagine what a frosty round that was.

My next recollection was in the South in the 1930s, when rough was cut by a sickle bar drawn by mules. During the heat of the day the mules had to be rested in the shade and allowed to cool off. The rough was really all weeds and not the grasses that we know today. Speaking of rough, you might be interested in the rough requirements for today's United States Open. USGA officials would like the rough to be uniform so that all of the players, as nearly as possible, receive the same lie—BAD.

The grasses of today, combined with the vast knowledge of our green superintendents, give us better conditioned rough and much more uniformity. To achieve this condition, however, more funds are necessary for weed control and fertilizers, but I believe we all agree that the results prove this money well spent.

Now for the green. Many improvements have been made on putting surfaces, and it is true that the most extreme improvements have taken place in the warmer climates. I can remember, however, some of the maintenance procedures used in the 1920s for the cooler climates. One of the examples—weeding greens with strings strung out to guide the men and their knives. Watering was done by a rotating sprinkler, covering only a small area, and the position of the sprinklers had to be changed periodically.

The first spiker I saw was a Dr. John Monteith invention—iron pipes with a handle and big nails drilled into position. The operator would stand on the bar, rocking back and forth, until it penetrated into the green. Can you even think what these operations would cost today, and what a sorry job they did by present standards.

Look at the construction of greens today. We now have scientific soil structure, great drainage and air ventilation; I remember seeing electric fans used to stimulate air circulation during humid nights. Looking at the putting surfaces of today and then looking back at the old days, it is really hard to believe that we have made such great progress.

In our part of the country we had two sets of greens, one for summer grass and one for winter grass. You can imagine what sorry greens we had with little character, bad green bunkering and, of course, poor putting surfaces as a result of having to use different types of grass. Today, we have either bent or one of the fine hybrid bermudagrasses which provide superior putting surfaces and allow for better designed greens.

In 1976 we are having the United States Open. A few years ago this would not have been possible.

Yes, golf courses in general are so much better conditioned today. In the 1950s, on our PGA Tour, many tournaments were played under conditions you would not believe today. Often so many local rules were involved covering unusual conditions. Fairways were so bad that players were allowed to improve their lie or play what are commonly called "winter rules." Drainage was so bad that the casual water Rule was worn out. Under such conditions, golf was not quite as we know it today.

We golfers owe a great debt to so many people and organizations for their work and efforts to improve playing conditions on our courses. A great amount of money has been contributed to research new grasses, new equipment and new methods of maintaining golf courses, while at the same time trying to hold down the cost, which is an increasing problem. The green superintendents and their various organizations have played an important part by their work with schools, seminars, and experimental stations. Through these activities, they have become real professionals in agronomy. The United States Golf Association, at great expense, I might add, has made considerable contributions with its Green Section Turfgrass Service program, research grants at various universities and experiment stations, and the work it does in conjunction with schools and colleges.

All of this educational work is important because young men must be trained to fill the need for future superintendents for the many new courses being built today.

These are many of the nice improvements we have witnessed during the last 50 years. Unfortunately, some areas of the game have not been improved and might even have lost ground. These areas need our attention. Golfers today desperately need to develop a pride in and respect for their golf courses. We must have a program educating players to rake bunkers, repair ball marks, etc. Also, it is imperative that golf carts be operated properly, thereby inflicting as little

damage as possible to the course. We need to stress strongly one of the basic rules of the game—play the ball as it lies. Even with the greatly improved playing conditions of today, far too many golfers are playing what we refer to as "winter rules."

Golf etiquette certainly has not improved with age; slow play is always a big problem. We need a constant educational program dealing with these problems. Golfers must be reminded that good golf etiquette, observance of Rules, and proper care of the course is all to their benefit.

Last, and probably most important, we need better lines of communication between green superintendents, the golfers, club officials and golf professionals to prevent unjust criticism of the green superintendent. All should be informed of current stages of course work as well as long range plans. Once this group understands your problem, in my opinion, your job will be more pleasant.

At the Atlanta Athletic Club I have a great relationship with Bob McGee, our superintendent, and I feel that he is the expert in this field. I try to be of all possible help to Bob by relaying the golfer's viewpoint, as well as explaining to our members why certain things are happening to their course, all to make their golf more enjoyable.

Harold Sargent, Atlanta Athletic Club golf professional. A career spanning 50 years of golf.



Rising Property Tax Assessments— Can Anything be Done?

by **GERALD F. HURLEY**, Executive Director,
National Club Association, Washington, D.C.

Rising Property Tax Assessments—Can Anything Be Done?

We believe the answer is yes, but we're not sure how just yet. You'll see what I mean as we go along.

But what does this subject have to do with you, anyway?

Maybe it hasn't hit your club yet, but an alarming number of our golf club members are now facing leapfrog jumps in their property tax bills, principally because inflation and the population shift to the suburbs and beyond has brought a heavy demand for all municipal services—which requires tax support. Our clubs are the victims of sprawl.

Unfortunately, taxation methods today create an economic compulsion to develop land and place economic penalties upon an owner or owners who do not want to develop along with the neighbors. When I say taxes, I'm talking anywhere from a few thousand dollars to over \$200,000 a year in property tax alone. Very few clubs can tolerate increased expenses and we can easily see how jobs, new equipment, member willingness to pay, and even the club's existence is threatened if we don't stem the tide. Club people and suppliers alike, we all have a stake in this campaign.

Who are "we" anyway? A shorthand answer is that the National Club Association is the national trade association which represents the business interests of golf clubs; its activities are supported by dues. Our Golf & Country Club Division Council feels that property taxation is such a significant bottom line problem for our clubs that we must help our members minimize that burden—

That's why the Council, with the support of the NCA Board, has launched a preliminary study which has two goals:

- 1- Analyze property taxation procedures across the country as they apply to golf clubs and recreation land,
- 2- Identify or develop potential forms of relief.

My objective is to summarize where we are in our study, report some early feelings and to suggest where all this might take us.

First, where are we now?

"Swamped," is probably the most accurate answer. The NCA and David Pearson Associates, of Coral Gables, Fla., consultants who are helping us with the study, have been sifting through data since January trying to pull together all we can that deals with golf course property taxation. One thing we've

discovered is that no one has done any definitive work in this area. We're breaking new ground.

As to the study itself—

1- We're getting a better understanding of the extent of the problem among golf clubs. Eighty-five per cent of our golf club member respondents in a recent survey wanted us to launch a study of this question.

15 per cent had tax increases of over 50 per cent in the last 5 years;

35 per cent had tax increases of over \$10,000 in the last 5 years;

23 per cent said the problem could force a liquidation.

How much can we tolerate?

2- We're looking at the broad spectrum of taxation methods across the country today. Of course this is a state's rights question, or better, county or municipal rights. Differential (let's not call it preferential) tax treatment is usually treated in a state's constitution or within tax regulations.

Currently, all 50 states use a variation of fair market value as the basis for general real property assessment. Fifteen states have enacted open space legislation; 13 of those provide for current use valuation. Thirty-eight of the states have interpreted their various constitutional clauses in a manner which would allow the use of a simple statutory amendment to protect private recreational areas; the other dozen would require a constitutional amendment to authorize open space legislation, such as was attempted recently in Ohio.

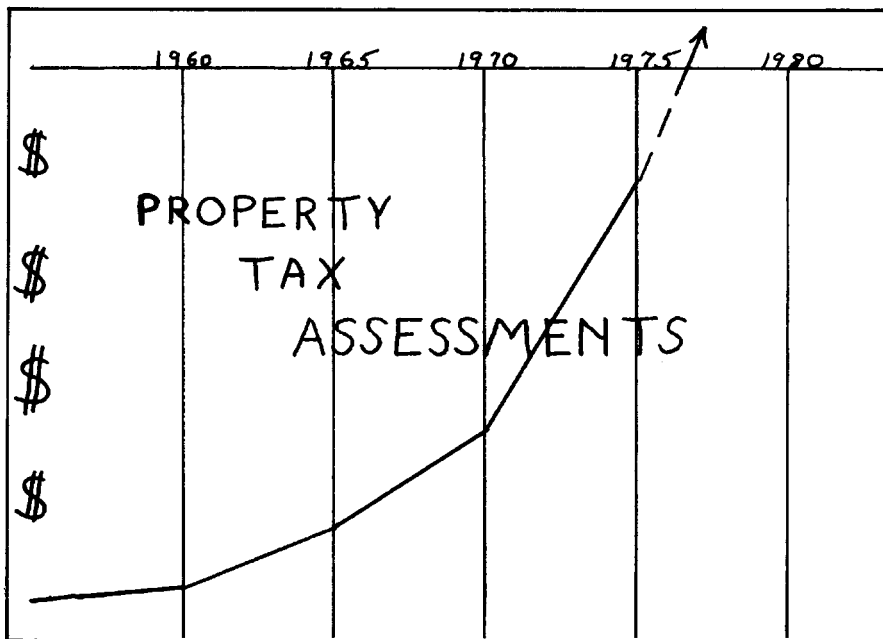
3- Whether for highest valuation or a use valuation, there are three appraisal approaches in California which we may find are used throughout the country.

a- The cost approach—

This is used frequently because land sales data is often limited and improvement cost data is available—

- (1) the replacement cost technique will be used more in the future;
- (2) *historical cost*, less depreciation used in the newer courses;
- (3) *reproduction or replication* costs; unlikely that any course will be replicated and identical materials are hard to find.

There are weaknesses in this approach, such as to what use is the comparable land (for valuation) being put, and what are the guidelines on the



depreciation of greens, etc.?

b- The income approach—

Here the appraiser wants to convert club income into value; he may ask "what income would this golf club property produce if put to its highest and best *golf course* use, whether that be for a profit-seeking course or a non-profit course?" This approach is very sensitive and must be studied in detail.

c- Sales comparison approach—

This is obviously a very reliable approach, but there's little sales data. The objective is to compare the various factors of the course in question with those whose sale price is known. One fault with this approach is that courses are designed to be different and, therefore, hard to compare. By the way, California tax authorities feel that the *irrigation system* is the club's single most important feature; without it the course would fail.

In comparing sales of properties, other things impact on the club's value—competition from other clubs, changes in the local customer mix and whether the cost burden of the operation overrides its value to members.

d- A fourth approach considers the club's Stock and Debt. There appears to be favor in the appraisal community first for the comparable sales approach supported by the income approach, backed up by "replacement costs less normal depreciation and obsolescence."

So much for approaches.

4- We'll be studying existing and proposed land use controls and legislation to determine what has been successful and what new steps to take. This will cover such things as zoning, easements, re-

strictions, transfer of development rights and so on.

5- Of course we'll try to identify opportunities for tax relief and what must we do to set the stage. We believe there will be some alternatives, but there won't be any single, magic answers.

6- Finally, we'll try to define areas for intense study and possible cooperative activity with other golf related organizations.

We believe that clubs should be sensitive to how their community relates to them and the value they place on recreation open space.

There is complete spectrum among clubs in their willingness to have their facilities used by scholastic and civic groups, municipal employees and sometimes, in the case of skiing, and so forth, the public at large. Some clubs have virtually no contact with their community *per se*, which may not be enlightened self-interest if you ever hope to develop local empathy for the club. That's a highly individual question.

But, turning from empathy to plain understanding, our members readily boast that our clubs contribute far more to the communities in dollars than in the services they draw. Houses surrounding golf courses are more valuable because of the course, or they *exist* because of.

As some detractors have pointed out, as printed in the *Washington Post*, "there's a list as long as one's imagination of multiple uses for acreage normally restricted to golf, thus providing a better cost-benefit ratio. Such lists include bike trails, picnic areas, jogging courses, boating, lawn bowling, flower gardens, and so on." Is that so? Where are the numbers? And who's going to pay the bill?

Frankly, we haven't found any numbers on either side of the question, but in a shouting match in court or before your County Council, we haven't a prayer

unless we can convert these "if it weren't for our golf club being here" claims into recognizable value. Can we do it?

There's no reason why we can't get a "how to" cost/benefit procedure started if we set our mind to it. We've been told by national experts in this field that real cost/benefit or tax-impact studies have never been attempted in recreation land use. But, then, they've never cared about the subject, either.

Finally, there doesn't appear to be an acknowledged system for determining the monetary value of recreational land for appraisers and assessors; and damage is done first at the appraisal level. The national appraiser and assessor groups recognize that their members often are operating in the dark and they don't like reversals in court. They'd like to study the question of valuing recreation land with us to better understand and normalize the situation for both our benefits. That will be a long range program of significance to the industry.

On current/potential relief mechanisms—

- 1) To date—open space legislation is an answer for many, but it can require a lengthy constitutional process, often is political to a fault because it can stunt local taxing prerogatives, and when the public gets wind of it, look out!

In 1973 we published a comprehensive analysis of state tax regulations with an emphasis on a model constitutional amendment: It is still current. While open space provides for evaluating land according to use instead of market value, often there aren't any formulas for such valuation. Hopefully, we may be able to contribute in this area.

- 2) Land valuation assumes a transferrable *right* to develop, which is worth money. Once that

right is conveyed or restricted through easement or Transfer of Development Right, the concept goes, its value is reduced, and its tax should be also.

There are a number of considerations on such restrictions. First, these easements, etc., are granted by the taxing authority; they are not for the taking. *Second*, once the value of the property is reduced, your capacity to raise a mortgage may be impaired. *Third*, the length of time on these arrangements will determine how often you'll be rerated.

- 3) The development of wetland protection laws may offer some protection. Local officials set the conditions under which the wetland protection laws can be applied. Possibly, the land can't be developed.
- 4) The last recourse, of course, is the courts—finding weaknesses in the appraisal process. We'll compile the most significant cases for quick reference.

As things are going now, we can already see two major areas to be studied that no individual club could tackle:

- 1- A system for evaluating open space in the appraisal process, in cooperation with national appraiser, planner and assessor groups;
- 2- Developing a system which helps in comparing club-used recreation land against any other use.

That is where we are—barely the edge.

We know that this first effort, which we hope to wrap up very soon, will only scratch the surface of this enormous question. We ask for your support, your input, your cooperation.

Government Regulations— Their Impact on Golf Turf Management

by **PALMER MAPLES, JR.**, President, Golf Course Superintendents Association of America and Superintendent at the Standard Club, Atlanta, Ga.

All of us are aware of the new regulations that have come from the different government agencies in the past few years. There was a time when the only form to fill out was the social security withholding form; that was our only contact with government. Today a number of forms and lists have to be filled out and maintained as we go about our business of growing turf. Today regulations govern not only people and how they work, but machinery, chemicals, noise, pollution of air and water, and housekeeping of the maintenance area and building before we even get

out to the turfgrass area itself. How are these regulations affecting the management of turf?

Presently, there are two major government agencies that, through laws passed by Congress, exercise some oversight in the management of turfgrasses. These are OSHA and EPA. One minor agency would be the Fair Labor Standards Act as it applied to the wage and hours laws, and possibly insurance and pension regulations.

OSHA refers to the Occupational Safety and Health Act of 1970. OSHA became an official part of

the National Labor Law in April, 1971, and has as its mission "to assure as far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources." OSHA proposes to do this through establishment of responsibilities for employers and employees, standards in an inspection program with fines and with guides for safety under all conditions.

How will this affect the grass in its color, growth, or survival? OSHA regulations deal with the men and equipment that are used to maintain turf.

- 1) Protective clothing must be provided workers spraying chemicals to prevent disease, insects or weeds interfering with the growth of or survival of the desired grass.
- 2) The machines used to mow the grass must have certain guards and safety devices to help prevent injury to operators.
- 3) A particular disease might go unchecked and kill the grass because during the previous spraying there was a machine breakdown caused by improper cleaning and servicing. The part had to be ordered because it couldn't be found in the junk pile of parts in the building and, the parts book had been used to start a fire with just a few days before.

This may sound a little ridiculous but it points out situations of health and safety that are really just good common sense operations. OSHA is basically application of recognized standards of doing business in a business-like manner. The MAN in management has more responsibility to his employees and employer as he oversees his operation. He must

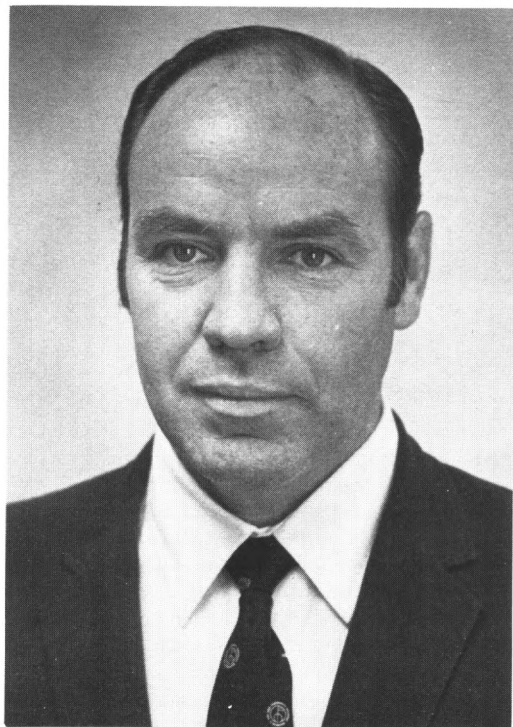
be aware of the law and how it affects his operation. He must maintain those necessary records, and if he doesn't, and the inspector finds cause to issue a citation, then upper management may wonder if it has the right man in charge. On the other hand, upper management also has the responsibility to furnish needed equipment, training, and time for the application of standards in the daily operation of the business.

The Environmental Protection Agency (EPA) certainly is a major contributor to awareness of government regulations within the turfgrass management field. The regulated use of chemicals will certainly have its impact on the turf industry in more ways than just the cost of chemicals. There is an excitement around the country now for certification of pesticide applicators. This is an EPA sponsored endeavor that comes from laws passed by Congress stating that by October, 1976, applicators must be licensed to apply pesticides restricted in use. (This certification deadline has now been extended to October 1977.)

Many states have already had seminars and training schools for the 10 different categories of users, and after testing they have issued licenses to those qualifying. It is expected that some future time an actual list of restricted pesticides will be published. Some changes may have to be made in a particular chemical used. Some chemicals have been removed from the market completely. This has been the case for DDT, and most recently new chlordane and heptachlor.

Superintendents will have to support local and regional researchers to help locate new chemicals that can and will do as good a job as previously used chemicals. For our own safety and the safety of the players, we must know how a pesticide works before we make an application to a golf course. Once it is applied, what happens to the grass, the pest, the golfer as he uses the grass, the water that runs over the treated area, the soil in the treated area, and to the man and equipment that made the application?

Any new chemical that comes into use today has to have certain back-up data concerning its performance. The companies manufacturing these products spend great sums of money developing new products, testing them to get the best, and then marketing the product to make it available for use. We who are responsible for the course, however, must know many things about this new product before we make the first application on our course under our conditions of soil, water supply, grass variety and



Palmer Maples, Jr., Superintendent at The Standard Club, Atlanta, Ga., believes researchers must now develop new chemicals to replace those previously used but now outlawed.

use of the area. The mission of the EPA is to protect and preserve the environment. So again, the MAN in management must be aware of the law and its effect on his business.

Wage and hour laws, insurance and pensions are other regulations that have their effect on turf management. These are added to point out the fact that today there is more to growing grass than just fertilizing and mowing. The impact of all the government regulations will be reflected in the individual in charge. He must now be trained in many areas, and not all of his time will go directly toward overseeing the actual maintenance of the grass. Part of his job and responsibility to the club or company will be spent in learning this new society of government agencies.

Let me illustrate this point of being aware of the law or potential law. Congress has at least presented the opportunity for input from outside agencies. There was a hearing recently on the use of leg-hold traps. How does this affect growing grass? In parts of the country, trapping is a means of controlling large pests that injure grass, trees, shrubs and people. Traps are used on many golf courses, and if they were not available, the cost of having the trapping done would be excessive.

There is another case of a regulation to require underground electrical wire to be placed at least 24-inches deep. This would really create problems for contractors and superintendents who wanted to install an irrigation system where there was already pipe in the ground. Can you imagine the extra digging to get around this pipe with control wires, and at the 24-inch depth? Why can't golf courses, with their restricted use, be classified with home lawns in

the use of low voltage wire?

Because only men can comply with regulations, it will be the man doing the job who will be affected most by these government regulations. Records must be kept up to date and reports filed at the proper time. Evaluations will have to be made of equipment, chemicals, men, procedures, research data, schools, seminars, policies—and the list goes on. Its ultimate effect will show up in the kind of turf that is presented to the user.

Just as doctors, lawyers and repair servicemen are specialists, the superintendent must become a specialist in his profession. He must know all of the special items available to him to perform his work. Special equipment, pesticides, fertilizers, grass varieties will be needed to accomplish this degree of performance. He will read books and magazines, attend seminars, turf conferences, talk with fellow superintendents, visit local and regional research plots, listen to turf Extension personnel—in one word, EDUCATION. This is the impact I see on turf maintenance by government regulations. There will always be pesticides, fertilizers, and mowing equipment; but the man who knows how to get the best use of each individual item, fit it into a planned program and get the work done by people will be the man with the best turf.

It is a time to go out and study what is happening in industry, what research is going on, what the users of my turf area want, and as a time of education and re-education. We must abide by the law as long as it is on the book, and if it is wrong, work to change it through proper channels. Experience is a great teacher and time changes many things. Put together, time and experience will usually produce the desired results that will be best for all.

Guest speakers at the 1976 USGA Green Section Conference. Left to Right, Charles Wilson, Joe Finger, Palmer Maples, Gerald Hurley, Harold Sargent and Paul Voykin.





Fall clean up—new growth next year.

Overgrooming Is Overspending

by **PAUL VOYKIN**, Superintendent, Briarwood Country Club, Deerfield, Illinois

During the last few recession years, North American golf courses, especially some of the private clubs, have been in a serious financial situation because of skyrocketing operation costs. These operational costs, along with real estate taxes and utility costs, have increased so much that many clubs are now having difficulty keeping their heads above water. Some, as you know, have sold out to real estate developers. Others are desperately looking to fill their decreasing memberships and reluctantly lowering their application standards in order to exist. The private country club situation has not been rosy. For some clubs, the overall economic picture is gloomy and almost critical.

Directors and management are working hard to find means of surviving without drastically cutting out the gracious living syndrome familiar to country clubs. Meetings have been held throughout the country, and I am happy to state that some have been productive in finding methods of reducing operational costs. The first place they look, of course, has been where they always lose the most money—the clubhouse. I have never known a large

private club to ever come out in the black. The best club managers at most are heroes when they can maintain or reduce operational costs below those of the neighboring clubs. At very best, their goal is to break even.

Now what about the superintendent's situation? What about the golf course? Although I have always stated that a clubhouse without a golf course is nothing more than a roadside inn, with other gourmet restaurants in the area as good or better, the officials of our country clubs are also looking in our direction with a frugal eye. They are looking and saying to us: What can you as golf course superintendents do to cut down expenditures? It's your turn now.

Gentlemen, it's been our turn since I got into this profession 20 years ago. But this time the situation is obviously different and their concern is even more grave. Although we have always tried to be conservative and have held tight reins on our expenditures for many years, we too have been caught up in this inflation and have had to increase our budgets annually in order to keep up with higher wages and

accelerating maintenance costs.

Ironically, in spite of bigger and better budgets, we are being short changed by the economy. We are getting less for the club dollar in every way. Our labor staffs have been reduced. The parts for our machinery are more expensive and, sad to say, less durable. Equipment and supplies are getting costlier every year and deliveries are slow.

Another additional expense that has come upon us suddenly in some states is the new law stating that we can't burn our dead leaves and trees anymore, but we must haul them to state approved dumping areas. Meanwhile, without any letup in sight, the demand for agronomic perfection and achievement keeps hammering at us. In spite of all these drawbacks, however, I think we have succeeded with splendid results. Our golf courses are meticulously groomed and maintained. This continuing pressure on grooming and spotless maintenance of our superb golf courses, during an inflationary period has increased our budgets to alarming proportions. We are in a serious rut, and I have a startling fact to reveal. You golf course superintendents are responsible. You, whom I have admired too much and tried to emulate, have brought us to this predicament. The best among you are to blame for the situation we are in. You have set the standards too high. Let me explain quickly what I am talking about and what I think the problem is before I am shot by a friend or teacher.

The problem as I see it is overgrooming of our golf courses. We now do too much of it. The desire to improve and excel in the maintenance of our golf courses has been carried to a ridiculous and costly extreme. My contention is that if we did less grooming, the clubs could save money and at the same time have a more challenging golf course with fewer headaches.

Let me also say that I definitely do not advocate reverting to the European type of maintenance, which really is cow pasture grooming by North American standards. However, many golfers who travel overseas are crazy about them and think they have arrived at Mecca even though they do much less grooming over there. This supports my arguments. Please understand, I am not in any way talking about reducing the upkeep and management of our greens and fairways. I am talking *ONLY* about possibly reducing the cost of grooming in other areas that we so diligently maintain now. In my opinion we can let some of the areas grow a little shaggy, a little hippy so to speak, and still have a great golf course.

At Briarwood we mow our greens at a tight 3/16-inch and our wide bent collars at 1/2-inch or less. Our sloping aprons that meet the fairways in the front are cut at 3/4-inch and then we use a triplex mower to mow around the bunkers and the back mounds of the green. This is all accomplished before we even come to the rough, which is also mowed too short and too frequently. The golfers love it that way, how-

ever—especially the ladies. The fairways are mowed from 5/8- to 3/4-inch with a strip or two outside our fairways which we call intermediate rough. On a couple of holes, especially for the ladies, I mow even lower from tee to fairway because the ladies' tees on those particular holes are too far away from the "nice grass."

Next example are our tees, which, except to be level, are really not that important. They are mowed too frequently, seeded, sodded and fertilized too often. The tee banks are also mowed constantly so as not to look shabby. The precarious mowing of fairway bunkers and the laborious hand mowing around all trees on the golf course also require a lot of time and expense. At my club this never stops, and missing a day or two because of a steady rain gets me into a nervous dither. I am not going to mention other numerous areas of grooming that I do at Briarwood, but I think you get the general idea.

I am sure there are many of you here who have to contend with other time-consuming, relatively unimportant jobs, like mowing high creek banks and cultivating shrubs around tees, over edging of bunkers, pruning too high under low-branched trees, and perhaps raking bunkers that don't come into play, mulching every leaf that drops in autumn and mowing out-of-the-way areas that really don't have to be groomed at all. I learned this two years ago when I left two acres on the west side of my course un-

Bullrushes and grass—no longer rotary-mowed.





"Unless other outstanding golf courses in my area followed suit, I wouldn't try less grooming without a solid agreement from my club."

mowed all season. No one complained. In fact, no one even noticed—except the birds, rabbits, bees and butterflies. They loved the wild preservation we left untouched for them, and even a few wild flowers came up.

In the past two years, I have left six or seven more acres untouched, making it a total of approximately 10 acres of rough that we don't mow any more at Briarwood Country Club. The only way out of the long rough is with a sand wedge. Most of the wild rough is remote from the playing area and a golfer deserves a penalty if he gets into it. My Green Committee Chairman and Committee supported me all the way in my "back to nature" endeavor. Now I think the entire membership has accepted the new concept of natural prairie grass and growth as being part of golf course play. I think they rather admire Briarwood's new dimension. We are proud of our "elephant grass," as the members call it, and it's rather amusing to hear the startled remarks of guests when they first view the tall natural stands of rough.

It is becoming too expensive to maintain 160 acres like our own backyards. The machines are going constantly from morning to night.

Now, I want to correct once and for all the chronic complaint by superintendents that the membership is playing too much golf and is interfering with our work. Not so; it's the other way around: it is we who are interfering with their play. We have spoiled the golfer rotten with expensive around-the-clock grooming. Now we have the

high-cost monster looking over our shoulder with hungry fangs, and we can't afford him for a pet anymore.

Let me give you an analogy. Remember when we used to go to a barber shop to get a plain, ordinary haircut? The haircut was cheap because that's all we needed to look nice and neat. Now, it's a different story. We have a thing called hairstyling. In order to look even nicer, we have our hair rinsed with a little coloring, then razor cut, styled with a hot-air blower, set with a hair net, and finally perfumed with men's hair spray. All this is created by a hairstylist who, instead of recommending more use of a hair comb, recommends a special electric brush and hairspray. Instead of talking mostly about hockey in reply to our questions, he tells us about some men's hair shampoo and men's body deodorants, and even advises us that perhaps a moustache would look so-o-o nice. We love this attention because all of us are vain to some degree, especially as we grow older. However, all this extra grooming costs money, which is all right so long as we can afford it. Once we can't then overgrooming is over-spending. That applies to our golf courses.

Now the first important question you will ask is, how much will this save? Here's what I did. I went over my time sheet from April to October 1975 and came up with these figures.

Mowing rough at \$3.50 per hour, 700 hours = \$2,450.

Mowing with a "professional" around greens and some tees, plus the practice tee, comes to 350

hours and \$1,225.

Triplex around tees and green and fairway bunkers comes to 400 hours times \$3.50 = \$1,400.

Rotaries around trees comes to 250 hours or \$875.

Total Grooming cost is \$6,000.00.

I only chose these items because they are four maintenance items which I feel I could reduce by 50 per cent or by about \$3,000. It would still give the membership a presentable, but slightly tougher and a definitely more interesting golf course.

Some of you perhaps may not be too impressed by a meager saving of \$3,000, but, gentlemen, the point is, in a tough ball game, every run counts; besides, we can accomplish other important savings, for example, in machinery. I know I could save an impressive amount on this item of machinery over the years because instead of having my present two or more pieces of equipment for the four jobs that I mentioned—rotaries, triplex, rough, and pro—I could get along with one piece of machinery in each category because of less demand for grooming. There is \$5,000 more saved right there, not to mention saving in mechanical upkeep and gasoline.

A substantial saving also would be realized in having to use less fertilizer and pesticides, because the grass would be longer and, therefore, stronger and better able to cope with the elements with less attention. Traffic damage by carts would definitely decrease. Keep in mind please, the fact that I chose only four items that I can reduce easily by a full 50 per cent. Many other maintenance aspects can be reduced by perhaps 40 per cent, 30 per cent or 20 per cent. It all depends on how far you want to go and still have a presentable golf course.

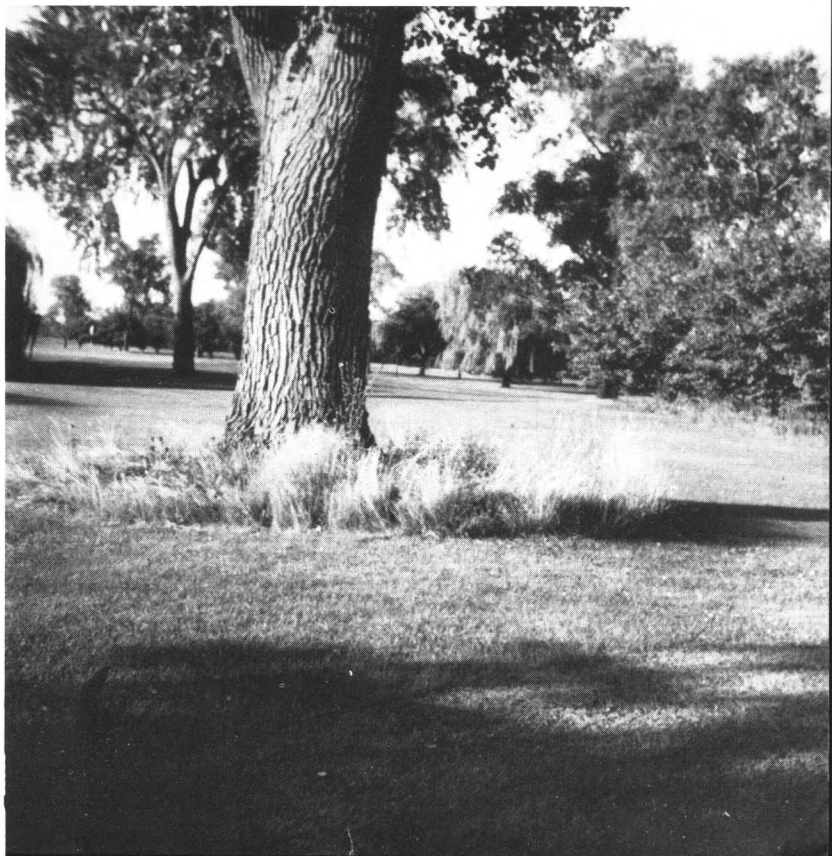
Now the question is: why don't I do less groom-

ing? My reply is that unless other outstanding golf courses in my area agree to follow suit, I wouldn't try it without a solid agreement from my club. I would be afraid, I think, that unless I had it in black and white, I might jeopardize my job.

I am not exaggerating. The accent on quality grooming in my area is that important. I don't dare do less maintenance. The problem is also compounded by 200 or more other greenkeepers at our clubs who play other golf courses in the area and then come back and tell us what great shape the neighboring courses are in. Many unfairly always compare the golf course grooming but give no thought to or have any knowledge of local conditions, such as drainage, soil problems, water source and work force, and they also overlook other important variables such as budgets, equipment and size of golf course. My, oh my, how they forget the size of the golf course and the fact that the more acreage, the more grooming is required.

In the near future I still believe we just may have to sit down with our Chairmen and Board of Directors and show them with cost charts that grooming everything meticulously to the point of almost pricing ourselves out of the game is ridiculous. We may have to further explain that letting the grass grow a little longer and become a little more like St. Andrews will actually make the game a little more challenging and more enjoyable. The way golf should be—the way it was meant to be. Every other sport, such as hockey, baseball, football, tennis, etc. has regulations for size; the playing areas are the same for everyone, hard or easy depending upon your ability.

Golf is the only accepted game where we can make an established area easier or difficult by maintenance procedures and techniques. We have



*Not every blade of grass
need be clipped.*

spoiled the golfer to the point where he is possessed with always having the ball in play. It started with the touring pro, and now the member is possessed also. The playing trend has swung from accuracy to an emphasis on long ball hitting and never landing in trouble. It's time we started back the other way. I believe the paramount objective of the founders and architects of this wonderful game was not this idea of present day "hairstyling" conditions and excessive grooming factors that are pricing us right out of the game. If they were here now, they would say to us, "Do less grooming—put skill back into the game."

In reading the recent results of the Chicago District Golf Association questionnaire; Item 6, Answers to Question, "Do you feel that green maintenance and capital improvements may require future limita-

tions due to financial pressure and the energy crisis?" the majority answered YES. In answer to the Question, "In what areas would you feel limitations might be first applied?," the majority from our Chicago golf courses answered, "Less golf course grooming."

To conclude, in the December issue of the *Golf Superintendent*, William H. Bengeyfield, the Editor of the USGA GREEN SECTION RECORD, wrote something that impressed me:

The word grooming is overworked today. Its meaning is muddled and in need of redefinition. A well groomed course doesn't mean that every blade of grass has to be clipped. Rather, it is a course that plays well from each tee to each green. That's the point; it plays well. The course is well groomed—for golf.

Role of Soil Tests in Turf Management

CHARLES G. WILSON, Director Agronomy and Marketing
Milwaukee Sewerage Commission

Certain rules are important and should be followed if results of soil sampling, laboratory analysis and interpretation of these results are to prove meaningful to your turfgrasses.

Samples must be correctly taken. They must be representative of the turf use function as well as the soil classification. Soil samples must be taken at an exact and constant depth.

Thoughts are changing regarding the frequency of sampling for maintenance turf. Recent sampling and testing evidence points to yearly sampling of the same turf use function area. Any established golf course, regardless of the number of holes or acreage need but sample one fairway, one tee and one putting green each year to keep abreast of nutrient trends on the entire area. Sampled areas should be typically average (neither the best or the worst) and the same function area should be sampled again the following, and each subsequent year. Also, sample any area where turfgrass injury or general unthriftness has occurred, provided the true cause of the injury, such as disease, insect damage, etc. is not already known.

New areas to be planted should be sampled separately. In this case a deep plowshare composite sample should be taken for analysis.

Maintenance samples should be taken at the same season of the year. At least two and preferably four weeks delay in sampling should follow any fertilizer application. Thus, most finished golf courses are looking at three samples yearly with possibly one or two extra some years for that new USGA specifications green, a trouble spot, or that once-in-a-decade check on the unfertilized rough. Taking

smaller numbers of samples over prior practices will save money. As to those who have never sampled, even this small amount will cost money. However, if even one worthwhile recommendation results the savings can be appreciable. As an example, under low pH or highly acidic conditions, nitrogen applications lose effectiveness. Adjusting acid soils toward the neutral point can result in a 20 per cent saving on nitrogen and make other elements more available.

Some day we hope to reach standardization of techniques among laboratories testing soils for turfgrass use. Until then it is impossible to compare one laboratory's results with another. Although much is being made in scientific circles about the merits of various extractants, cation exchange, calcium-magnesium ratios, etc., these factors pale in significance with proper sampling and proper interpretation of the results. This is because turf is a permanent and seldom harvested crop.

In the past we have said the soil test results should be interpreted by a turfgrass agronomist. Undoubtedly this was a step in the right direction as against having the tomato, corn or buckwheat scientist attempt to diagnose results for a completely unfamiliar crop. Now it is time to make further qualifications on expertise. The advisor must be aware that some turf areas are harvested continuously, whereas others never have nor ever will experience a crop removal. Further, he must understand that the ratio of N-P-K in the clippings should have absolutely no bearing on the N-P-K ratio in the fertilizer! These are strong but long overdue words.

Admittedly this will cut down appreciably on



Determining pH and lime requirements in laboratory.

those I feel are competent to give advice. Anything we do that can lead us away from the policy racket or "numbers game" in fertilizers is certain to save money. Once this comes to pass, the turfgrass grower should be fully as capable as the trained agronomist to formulate fertilizer programs based in part on soil test results. The practical value of soil tests properly interpreted are excellent to determine pH or soil reaction and levels of calcium and magnesium. They are fair to good for phosphate and potassium, and worthless as far as nitrogen is concerned. They can also be quite helpful in determining salinity problems, but they aren't very helpful on minor and secondary elements. Maladies from the presence or absence of these minor elements most often show in imbalances in the grass tissue rather than the soil.

So much for the known. Now to the reasons why the value of soil testing is in dispute, or perhaps I should say disrepute. Most of us know that test results have been used to sell fertilizer, or, a soil testing service. It is probably not so well known that our university system must also share some blame. We still run into instances of our experiment stations recommending 10-10-10 at 10 pounds per 1,000 square feet, irrespective of the test results or functional use of the area.

I sometimes think some of us have failed to appreciate the obvious. The soil supplies the needed elements, and it needs but little supplemental assistance where a crop is never harvested. A constant reminder of this is to look at that deep rough that hasn't been fertilized in many years, if ever. The grass there must be self-sustaining without man's help. It is self-supporting because it is self-fertilizing. The reason: CLIPPINGS ARE NEVER REMOVED. I

repeat, whether or not clippings are removed should be the largest factor of all in determining fertilizer practice.

Other than nitrogen, our industry has failed to give proper consideration to the source of the nutrient. It is important. I am responsible for switching the turfgrass grower from muriate to sulfate of potash. I say this not to gain credit. Unfortunately the reverse is true. Had I let this "sleeping dog lie" most mixed fertilizers sold to the trade would still contain the less expensive muriate or potassium chloride, and at a savings to you.

Despite this, my intentions were good. In resurrecting the "salt index" of fertilizers, I found some nutrient sources had a much greater tendency to cause wilt, burn and desiccation when compared to others. This classic work was published by Rader, White and Whittaker in Soil Science Proceedings 55, in 1943. Among many interesting things it shows 60 per cent muriate of potash has an index of 116 compared to sulfate of potash at 46. Thus, muriate has twice the tendency to burn grass. In fact, muriate on a pound for pound basis was the saltiest of all the materials tested. It was sometime later that we found sulfate of potash often was poorly granulated with poor water solubility when compared to muriate.

I still advocate the use of potassium sulfate under conditions of dire need as shown by the soil test whenever temperatures are 80 degrees Fahrenheit or higher, or increasingly where we suspect the lack of sulfur could be limiting growth. We must, however, ask ourselves why we should apply any potash source in hot weather when good management tells us the potassium applications are best made during cool growing weather when materials with high salt indexes seldom cause trouble. This is the time to ap-



Often the grass plant will send signals; soil testing is needed.

ply muriate at a saving on both the water and fertilizer bill.

Please do not confuse cool with cold, non-growing weather. Potassium can only help a grass's winter hardiness when it is inside the root-leaf system. Those who apply potassium or mixtures containing this element on dormant turf are foolhardy to say the least. They are begging for trouble should the weather stay dry and open after the water system is turned off. Cool weather is also the time to apply water soluble, fast release chemical nitrogen, if needed, and for the very same "high salt index" reasons.

The other unfortunate result of our romance with potassium is that formulators now offer mixtures containing almost as much potash as nitrogen. Even though increasingly it is the expensive sulfate of potash in the mix, the burn tendency is still there, and it offsets to a great degree the safety of the slow release expensive nitrogen in the product.

N-P-K fertilizer mixes make little sense for use on established turf. They were designed originally for use before planting in the same way mixtures are advocated for farm crops—to bring the seed from planting to fruition. Again, unfortunately, the ratios available to the turf planter are poor. In establishment we need something like a 3-12-6, or similar. This can safely be applied at 40 to 50 pounds per 1,000 square feet, or in enough bulk to adequately cover the area in depth. At the same time it will supply a goodly quantity of phosphorus and potash as

well as some water soluble nitrogen, and without hurting the seeds or seedlings. The high analysis mixtures are designed for banded row planting of farm crops, not turf. Despite this, the fertilizer formulator wants to sell you the high analysis mixture. Why? Because he makes more money on the mixture as compared to selling you source materials. He will continue to do this as long as you, the user, are willing to accept a mixture and those in an advisory capacity advocate their use.

I sometimes feel the worst thing that has ever happened to turf is the researchers' performance measurement of grass based on weight of clippings and their nutrient content. It really isn't. It just seems this way because many growers and experiment stations have interpreted these results to apply to all turfgrass areas whether or not a crop of clippings is actually being harvested. How else can one explain the N-P-K ratio of fertilizer mixtures applied to fairways where a crop is never harvested?

Any mixture is bound to look good if it contains nitrogen. In fact, if nitrogen is eliminated, the mixture would not sell. Our question is: "Can we any longer sanction the use of unneeded elements just because the mixture contains nitrogen?" I think not. To do so blows the whole concept of trying to grow turf more economically.

Where soil tests show a need for extra phosphorus or potash, the source materials should be used and applied separately from nitrogen. But let's make certain the need is really there, and that it is

not the nutrient ratio in healthy clippings that you or the testing laboratory are looking at. All too many of us have been rebuilding the auto with new tires and spark plugs when all it needed was a little gas to make it run.

Even on putting greens, and, increasingly teeing areas, because clippings are harvested, the source materials make sense over using mixtures. They are less costly and they provide complete flexibility in application.

I'm sure most of us are familiar with the source materials. I mentioned the two major potassium sources. With phosphate it is becoming increasingly difficult to get the older and much better 20 per cent super, so you may have to settle for the treble or 45 per cent variety. This brings up another interesting point. Most of us have been led to believe the higher the analysis, the better the value. "'Taint so!" As the phosphate percent doubles in concentrated superphosphate, sulfur is lost. When urea replaces ammonium sulfate as a nitrogen source, the same thing happens. If in doubt just ask the grass—your grass—the high analysis question. It may take a while to get the answer on our heavier soils in industrial areas, but almost no time at all in Florida and the Pacific Northwest.

In most areas you have a choice between dolomite or calcite lime. It makes little economic sense to use the more expensive dolomite if magnesium levels are adequate. We sometimes find that using the coarser grind can also save a buck.

There are a raft of cold water-soluble, fast-release chemical nitrogen sources. Ammonium sulfate,

ammonium nitrate, calcium nitrate and urea are the major ones used on turf. The more slowly available nitrogen sources include ureaforms, I.B.D.U., coated ureas and the natural organics like leather tankages, seed meals and activated sludges. A good economic case can be made for both fast and slow release forms. In fact, many turfgrass managers use a combination of water soluble and slowly available sources each year. This makes good sense when used separately and not when mixed together.

For example, a cool-season grass needs it, and if weather conditions are such that only a water soluble source can be expected to perform, it makes little sense to apply a slowly available material at the same time. Conversely, warm to hot weather applications of water soluble nitrogen as a fertilizer, and not as a colorant, make no sense at all. They cause too many problems with moisture stress and over-succulence then.

Finally, we say only recommendations that have been field proven should be followed. This is done by making test applications. You should do the same. Ask your grass what it thinks about the soil test recommendations. It doesn't take that much time or that much money to put out a few test plots. Just remember, in so far as possible, keep the elements separate. You don't want to confuse a sulfur response with a potash application, or have nitrogen mask the need for phosphorus.

The field test concept may be the best way of all to save money, or, at the very least, to make sure the money budgeted for fertilizer is being properly spent.

ABOUT THE AUTHOR: Few turfgrass agronomists have traveled more extensively throughout the western world than Charles G. Wilson. None have been more closely associated with chemical soil testing techniques and analysis. A graduate of the University of Maryland, Mr. Wilson served with the USGA Green Section for a number of years and now as Director of Agronomy and Marketing for the Milwaukee Sewerage Commission.





Permitting grass to grow naturally at bunker's edge can save money.

REDESIGN *for Less Maintenance*

by JOSEPH S. FINGER, Golf Course Architect

Maintenance costs have been increasing at the rate of 8 per cent per year for the past seven years, putting pressure on the membership's ability to pay. Personally, I know of no course which has been entirely redesigned solely for the purpose of reducing maintenance, although I know of a few courses where the quality of turf was so bad and maintenance became so excessive that redesign became desirable. Redesign usually becomes necessary from one of several causes:

First, perhaps there was poor initial architectural design from a golfing standpoint or from an agronomy standpoint, creating bad golf holes or bad turf.

Second, poor construction practices might have caused poor drainage or bad soil conditions.

Third, there is obsolescence. Many courses were designed before high compression balls and the new lightweight steel shafts and swing-weighted clubs were developed, and the courses are, at least in the opinion of the members, too short and too easy.

The **fourth** cause of redesign of the golf course

might be strictly unrelated to golf. Sometimes the membership needs additional tennis courts, or the clubhouse needs to be expanded, or the parking area is too small, or a practice range is required. Occasionally the state or federal government decides the golf course is the ideal spot through which to run a four-lane or six-lane expressway.

In my opinion, the game is entering a critical stage, and the survival of the game for millions of people will depend on cost reductions. All clubs and golf courses need to take a good look at their own situations to see whether redesign would help them lower their maintenance costs and reduce the pressure to increase dues or fees. There is no sense in spending \$5,000 to change something which saves only \$200 per year in maintenance. If, however, the project will pay for itself in three to five years, it stands an excellent chance of being approved by management or the Board of Directors. Another factor entering into redesign is pride. Members want a better, stronger, or more beautiful course. If the high cost of maintenance of a golf course is necessitated by the desire of member-

ship to keep the course as beautiful as possible, or more challenging, or even difficult, then the payout period becomes secondary to esthetics. Unfortunately many good country club quality courses are being down-graded severely by practices which are supposed to reduce maintenance costs but which actually result in false economy. I refer in particular to the practice of letting the greens grow in, that is allow them to become smaller. The future costs of increased traffic in a smaller area and the resulting compaction of the greens often more than offsets the reduced maintenance costs of less mowing time, particularly with riding mowers.

Let's examine some of the factors contributing to high-maintenance costs and what might be done about it. Starting with the tees, some of the older courses and a few of the newer courses contain many small tees as opposed to one or two larger tees. As a result, mowing costs are increased by the necessity of having to transport the mower from one tee to the next as opposed to continuous mowing efficiency. Second, the slopes of the tees: Many tees in the old days were built when hand labor was still 30¢ an hour, or less, and the cost of maintaining a tee with side slopes of 2 to 1 was not too much of a problem. Slopes on the sides, fronts, and backs of tees should be kept to a minimum of 4 to 1, and a preferable slope of 6 to 1, so that mechanical equipment can be used and hand maintenance avoided.

The size of the tee itself can reduce maintenance. A tee which is too small receives too much wear and tear, forcing the need for re-seeding and top-dressing many times during the season. If a tee were larger, the natural regrowth of grass into a used area might be sufficient. Shade around the tees is also a factor. Members love to have the tees in a grove of trees where they can obtain protection from the sun in the summer as well as to give aesthetic values to the golf hole. But with the exceptions of certain shade tolerant grasses, trees often contribute to poor turf around the tees.

Now for the fairways. Many fairway problems begin when the course is constructed. It is absolutely necessary to provide a good seed-bed for good fairway turf. Modification of existing poor soil conditions will greatly reduce future maintenance. The same can be said for those areas which are low and which retain too much water. These spots must be well-drained if they are to take the normal traffic of a busy golf course.

The choice of the right grasses for the fairways is also important. Recent wear tests on northern grasses show that certain selections are more wear-resistant than others. If there is shade along the fairways, the use of certain fescues in a mixture of bluegrass or rye grass might save a lot of headaches and maintenance. In southern areas, the use of hybrid bermuda grasses can actually reduce maintenance by forming a dense turf which is relatively impervious to weed seeds as com-

pared with common bermuda. Common bermuda is very open in springtime due to its loss of leaf structure during winter play. Consequently weed seeds are able to reach the earth where they germinate more easily, increasing herbicide costs. This is quite obvious on courses which have large spots of hybrid bermudas and common bermuda side-by-side.

Correct watering of the fairways is another means of reducing the maintenance costs. Careful watering, particularly with automation, can greatly reduce maintenance costs of fairways.

In hilly areas, some slopes are so steep that erosion becomes a problem each year. The use of proper diversion terraces, particularly those which can be landscaped out so that they don't appear to be engineered ditches, are quite helpful in avoiding such erosion maintenance. In fact, it is possible to divert entire water sheds, if it is done legally.

Greens, of course, occupy a major part of the maintenance budget. In general, the maintenance costs of greens is in direct proportion to the area of the green. But if the greens are too small, the wear and tear concentrated in the middle of the greens will soon cause the maintenance costs to exceed those of a green which is larger. You might call this the "law of diminishing backspin."

There is no question in my mind, based on my 20 years of experience, that building greens according to the USGA specifications will reduce maintenance costs. The balance of factors achieved in a USGA specification green are such that watering can be minimized, application of fungicides can be minimized, application of fertilizer can be optimized, and future problems of compaction, aerification, etc., virtually eliminated. The only trouble with the USGA type greens is that not enough people believe in it. Too many club members, who become overnight experts, believe that the seed-bed mixture is "too sandy—it won't grow anything. We've got to strengthen it by adding topsoil." This is often done, over the objections of the knowledgeable superintendent. A few years later, the green gets hard, crusty, and won't hold shots. Then somebody gets the idea that the way to improve the quality of the green is to add sand. So they add sand, and the death of the green begins. As most of you already know, stratification is the No. 1 "No-No" in greens construction and maintenance.

If you are still watering your greens by hand, I urge that you automate as quickly as possible, even if you can't afford to automate the fairways. Good greens watering is essential to good greens and lower maintenance costs. Good quality labor to water the greens at night is fast disappearing. It isn't even a question of payout; it is the question of "where are you going to find people who will even water at night?" We think automation is essential.

Since the greens are watered regularly, it is necessary for the bunkers next to the greens to be so constructed that the water will not run off the



Maintaining grass on a gradual slope can save hand-mowing and hand-raking costs.

greens into the bunkers and thus create added maintenance costs. This is one place where the expression "don't give me any lip" does not apply. Another place it is possible to save money is by the elimination of bunker edging by the use of existing or special grasses to form the lip of the trap. And remember, it's not just the cost of cutting the lips; it's also the cost of replacing dirty sand occasioned by the soil's washing from the lip into the bunker whenever you water your greens. The use of riding bunker rakes is another must in reducing maintenance. Therefore bunkers have to be designed so that 90 to 95 per cent or more of the area can be so raked. This means redesigning the radii of curvature and the slopes.

Edges next to bunkers are responsible for high maintenance costs. This is often caused by a trap which is too large and which forces the player to walk along a line immediately next to the bunker when the player goes to the next tee. Perhaps cutting the bunker in two and making a large pathway for golfers in between will help. But if you can't help it, these problem areas should receive a seed-bed material almost as good as that used on the greens. Sometimes the greens are barely large enough to accommodate the necessary hole placements and the traps are very close. If the green cannot be reduced in size to allow a collar of at least five feet, perhaps the traps can be moved a little farther out. This would reduce the wear and tear on the periphery of the green occasioned by the riding mowers. Check also to see if you have too many trees or too much shade on your greens, increasing the necessity of fungicides, aeration, etc. Good air drainage is just as important as good sub-drainage.

Sand bunkers of all sorts cost money to build and they cost money to maintain. Some superintendents advise that it costs from \$50 to \$150 per year to maintain a bunker. If you have 80 to 100 on your course, this becomes a substantial item. The Club and its architect should first take a good look at reducing the number of bunkers, particularly those that are only in the way of the average golfer and do not necessarily hinder the low-handicap golfer. I'll have to admit that there is hardly anything prettier on a golf course than dark green grass and white sand, particularly in irregular patterns. If the object of your program in redesigning your greens or course is to make beautiful pictures for the magazines, then I suggest you use big long bunkers from tee to green or extending 30 to 40 yards out in front of the greens. These will make beautiful pictures; particularly if you take them from an airplane. But they make expensive golf courses and slow play. If the bunker is designed properly it will not be cut so steeply that either the golfer can't take his stance, or the sand is beyond its natural angle of repose where it will slough at the slightest movement of wind, water, or vibration.

Personally, I believe that any course which has more than 50 or 60 traps is probably over-trapped, and the course should have a study made to determine whether unnecessary bunkers can be eliminated. There is also the possibility of creating grass bunkers instead of sand traps; and as any player will tell you, high grass is much tougher to recover from than a sand bunker. In the fairway areas, I prefer to use "tree traps" instead of sand traps, except for the "picture holes."

On this subject of bunkers, I would like to make

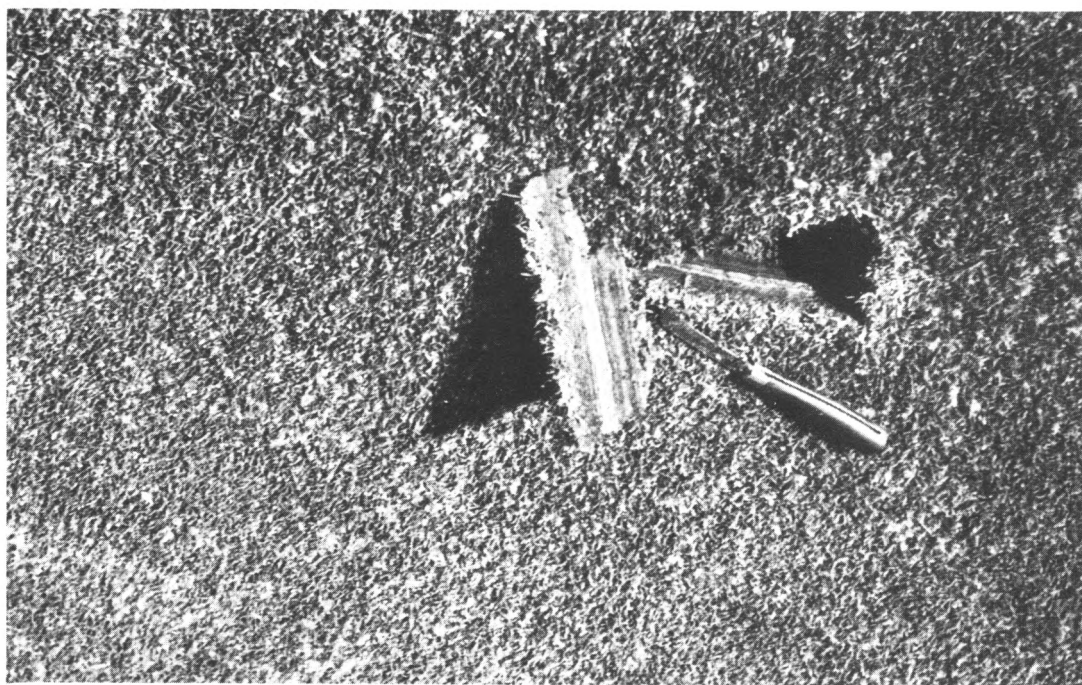
a statement which is about as profound as can be made where golf courses are concerned: There is usually no agreement between a superintendent and a golf course architect when it comes to traps. The superintendent wants a bunker which is so shaped that it's very easy to mow around. The architect, in trying to please the membership, has to design what are often referred to as "character" traps with all the little "walk-outs" or "tongues" and irregular shapes reminiscent of the old Scottish courses or links, but universally used where the "pretty picture" impulse is predominant. So, if you want "character" bunkers you'd better be prepared to pay for the maintenance. But here again, the use of slow-growing grasses will permit a greatly reduced mowing program for these hard-to-reach areas.

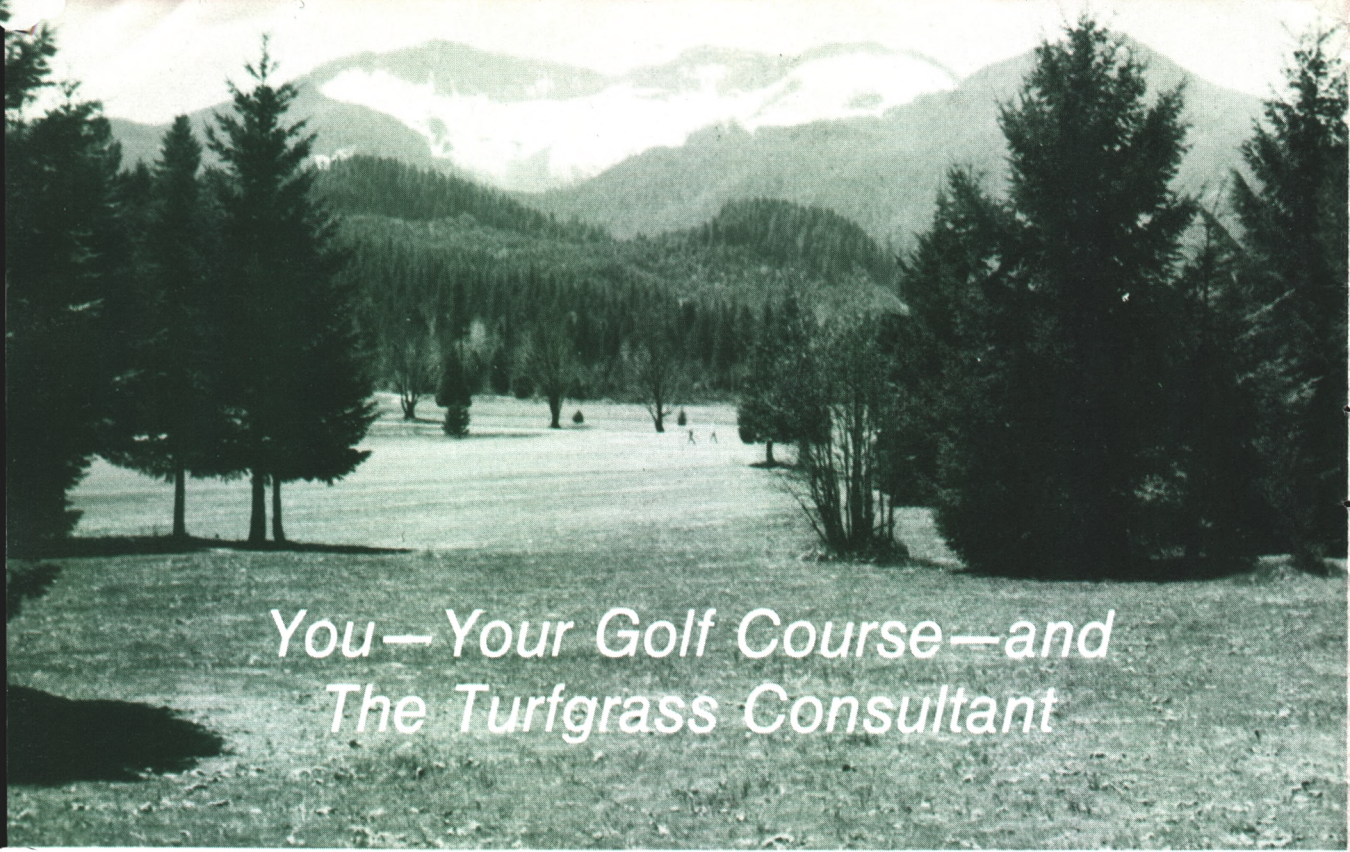
Even the roughs need to be examined for their effect on maintenance. Sometimes in an effort to reduce initial costs, too many trees are left in the rough and it's impossible to mow the roughs with riding equipment. I suggest that a study of the roughs be undertaken so that eventually no tree is closer than 15 to 20 feet from its neighbor, thus permitting mechanized equipment to cut the grass. And high maintenance shrubs and trees which produce suckers, such as Japanesst ligustrum, or certain privet hedges in the south, or those bushes which have to be pruned often to be controlled, probably ought to be eliminated.

Last, but not least, examine your watering system. Remember, water costs money, whether

you buy it from a city or pump it from a well or obtain it from a lake. And you have to pay for the electricity to run your pumps. Therefore, saving of water and saving of electricity or fuel should be paramount. Anyone who has tried to handle a manual watering system knows that sooner or later over-watering with run-off will occur.

I'd like to sum up by stating that although some of these problems are common to all golf courses, each golf course and club is an individual. It not only has its own problems of soil, slope, design, etc., but it also has its individual membership, and each membership might have different requirements or standards of quality. Therefore, each course must be considered separately, and an objective long range program of improvement should be made by a qualified golf course architect to obtain the best results. I say a qualified architect because it is impossible to separate any change on the course from esthetic values or playability. Except for rather routine or minor changes, this work should never be done either by members or golf professionals or by course superintendents, no matter how well-meaning. Although we have great respect for these gentlemen and the jobs they do, most of them are not qualified to evaluate the inter-relationship of the sight values and shot values with the agronomy they seek. Their advice is valuable, but major changes are a job for the professional golf course architect. We believe that if you are real sick, you ought to get the best doctor available.





You—Your Golf Course—and The Turfgrass Consultant

by **WILLIAM H. Bengeyfield**, Western Director & Editor, Green Section Record

There is an old English proverb which goes:

If I give you a penny and you give me a penny—neither of us will be any richer. But if you give me an idea and I give you an idea—then we are both richer!

And so consulting had this meager beginning.

Where did we come from? How did turfgrass management evolve? History can be an interesting and helpful study.

Happily for us there are more and more people in this world who love to play golf. The National Golf Foundation tells us there are over 16 million golfers in the U.S. today.

It seems it all started over 800 years ago at a major sea trading port in Scotland. In the 12th Century, St. Andrews was a trade center visited by ships from throughout that part of the world. The Dutch traders found the green linksland between harbor and town ideally suited for a popular ball and stick game from the Netherlands they called "het Kolven." The sandy coastal soils, the smooth wind-blown, rolling terrain and the soft, springy turf sustained by howling gales and gentle rains produced the green links. Natural too, were the pits of sand where sheep huddled for shelter, later to become hazards in the evolving game of "goff."

Through the centuries the game cast its spell over these people, their land and eventually over the earth. The game persisted from the 12th Century and, by the 1700s, townsfolk of St. Andrews simply called the narrow strip of land leading from town to the harbor "The Green." The course was known in this way for generations. They would tee up with a handful of sand, hopefully drive the leather-wrapped feather ball to a spot they called the "fair green" all the while keeping it out of the surrounding heather and mass of entanglements. Once on the fair green, the next target was the "play green," a roughly prepared area with an equally roughly prepared hole in it. In early goff, the winner was determined by the number of holes he won in a contest, not the total number of strokes taken during the round. Whether it be by 5 or 15 was of minor concern, just as long as he won the hole.

Now, this is 1976 and we in the United States are celebrating our 200th birthday. But it was in 1754 that the Society of St. Andrews Golfers (later to become the Royal and Ancient Golf Club) was formed. The Old Course at St. Andrews has always belonged—and still does—to the citizens of St. Andrews. However, the Society of St. Andrews Golfers in 1754 sought special playing privileges there. We would probably call them "starting times"

today. In return for this privilege an agreement was worked out with the town fathers to pay for the maintenance of the Old Course. This is a very interesting historical point. It seems the Society was actually concerned with the care and maintenance of the turf on the Old Course in 1754 while it was not until 1892 (138 years later) that it assumed responsibility for The Rules of Golf.

By the end of the 1700s the first greenkeepers came into being. Not unlike today they were charged with making things better for the golfer. In fact, from the records of the Aberdeen Golf Links in 1820, we find the club agreed to pay Alexander Monroe £4 a year (approximately \$15) for "taking charge of the links and providing accommodations for the member's boxes." Monroe was also to pay particular attention to keeping the holes in good order. In 1822, two years later, Monroe's salary was reduced to £3 a year!

Long before there was golf on this side of the Atlantic Ocean, the Society of St. Andrews Golfers decided to rebuild some of their old greens. This was in 1832! Just think, in the United States in 1832 Andrew Jackson was re-elected as President. In this same era, Maine became a state in 1820; the Erie Canal was completed in 1825; and Texas declared its independence from Mexico in 1836. At St. Andrews, they were busy rebuilding and enlarging their "old greens." The enormous and famous "double greens" as we know them today were being built in 1832.

And so the care of "The Green" had its beginning. The early golf professionals frequently became greenkeepers. Even in those days, neither job was known for its security. Old Tom Morris, still considered the grand old man of golf and four times winner of the British Open, became greenkeeper of St. Andrews in 1865 and continued until 1904. He had two rules for his turf maintenance program:

- 1) "Mare Sound, Honeyman," was his cry for his assistant, Honeyman, to apply evermore

topdressing of sharp sand to the greens, tees and fairways. Tom Morris said it was needed "to maintain the character of the grass."

- 2) His second rule was, "Nay Sunday Play. The golf course needs a rest even if the golfers don't."

And to this day—there is Nay Sunday Play on The Old Course. As a tribute to Old Tom Morris, the first patented hole cutter was developed by one Charles Anderson and presented to him in 1869.

Golf was now sinking its roots in our country and around the world. The first turf garden in America was established at Manchester, Conn., in 1885 and the first turfgrass research was recorded in 1895 at Kingston, R.I. Grazing sheep were still being used in the early 1900s for mowing and nurturing the green cover of golf courses. Although the lawn mower was invented in the 1830's, it was slow to be accepted. It was much less expensive to mow the grass with sheep.

Now two explosions lay just ahead for golf in America. The first occurred in 1913 when an unknown Francis Ouimet, a 20-year-old caddie, beat the world's greatest golfers of the day, Englishmen Vardon and Ray. This was at the U.S. Open Championship at The Country Club, Brookline, Mass. The popularity of the game soared.

About the same time, agricultural science had budded and was about to bloom. The USGA, organized in 1894, supported publication of a new book in 1917 called, "Turf for Golf Courses" written by Drs. Piper and Oakley of the United States Department of Agriculture. These men were not only scientists, but golfers as well.

The Green Section of the USGA was formed in November, 1920, and gained support from green chairmen and green keepers alike. It is difficult for us today to imagine or understand the complaints of the golfer even 40 years ago! Disease was the big grass killer of those days, and Dr. John Monteith,

One of the double greens at St. Andrews, rebuilt in 1832, is visited by the author.





At St. Andrews, the linksland between harbor and town became known as "The Green."

then Director of the Green Section, developed the first effective fungicides for their control. Many of his findings are still in use today. The march of science made possible new machinery, new grasses, new chemical fertilizers, weed controls, insecticides, improved soil mixes, irrigation and drainage designs, etc. All followed in blazing succession from the early 1920's on.

Today the golf course superintendent receives more advice than he can possibly handle. All 500 club members know more about growing grass on the course than he does. The club manager, the golf professional, the salesmen, his wife, the conferences, the university, the Green Section—every one is in the game! But a wise man once said, "Advice is only as good as its source," and that immediately eliminates a lot of people.

Turfgrass consultants are a product of today's technology and golfer demands. There is a need to share and exchange information along all those interested in professional turfgrass management. The truism, "No one has all the answers" is more applicable today than ever before.

The Green Section was the first turfgrass consulting service, and today, it remains the only agency devoted solely to golf course turf, its playing conditions and its management. Herb Graffis, of *Golfdom*, has said, "The USGA's Green Section is the biggest bargain any sports organization—amateur or professional—gives its players and the public."

Today, private consultants are slowly but surely coming onto the scene. Florida is probably the most active ground for the private consultant. He is usually a retired golf course superintendent, a golf professional or, increasingly, a commercial representative. Some private consultants come from uni-

versity life. Active as well as retired university people have found the practice an interesting and rewarding career.

The Extension Service offered by State Universities is another source of consultation assistance. County Agricultural Agents are available in most counties throughout the country and can offer information in many scientific turfgrass management areas.

I'd like to pose a few very tough questions and follow them with some very tough answers:

- (1) *Question:* With so many specialists available from all sources today, why should a club spend money for a consultant?

Answer: We think we may have already answered part of this question: i.e., "Good advice is only as good as its source." Many specialists are available today not only from State Universities but also from commercial firms, turf products salesmen, trade journals and scientific magazines. This is all to the good. Indeed, the more factual information one has, the better he will perform. In this regard, the USGA Green Section has two things going for it; 1) It has factual turf management information and experience for golf and, 2) It has no axes to grind.

- (2) *Question:* What should you expect from a consultant; at least from a USGA Green Section Consultant?

Answer: you should expect to have assistance and support for a better golf course. You should expect to be kept up to date on research and program review. After all, two heads are better than one. You should expect honesty, new ideas, openness, unbiased recommendations, support, understanding

and fairness, encouragement and professionalism. You should not expect to be second-guessed, embarrassed or to receive phony praise. Honest praise, Yes! Manufactured praise—No!

- (3) *Question:* What can a superintendent do when a consultant is called in without his approval?

Answer: The first thing I would do would be to ask myself, "How did this situation develop in the first place?" The answer often lies in the fact that something has gone wrong with turf management operations. At times a superior feels the need for additional information or possibly different results on the golf course. He is looking for a new approach, another evaluation perhaps and the wise superintendent will use the situation to his ultimate benefit.

Remember, a consultant is not after the superintendent's job. He is not interested in holding the superintendent's salary down. The consultant's success and effectiveness comes only from helping the superintendent do the best possible job under his conditions.

- (4) *Question:* How can a superintendent most effectively use a consultant?

Answer: It is the golf course superintendent who controls the effectiveness of the consultant. Without the superintendent's interest and good intentions, the consultant can only fail. The superintendent must be dissatisfied with mediocrity and have a desire to move ahead and produce the best possible golf course with the funds available. The superintendent should be the leader and know what problems are the most important ones and

have his own plans for corrective action. Then, he should expect the consultant to comment, offer his experiences and suggestions and what he has seen others accomplish in this regard.

There is nothing more defeating for a consultant than to visit a course and have the superintendent say, "Well, what do you want to see today?" With the superintendent's leadership, he can effectively use the consultant to gain his objectives in the most efficient and effective manner possible.

- (5) *Question:* Do you really need a consultant?

Answer: It depends on what you mean by "need." If you are talking about basic needs, such as survival, all anyone really needs is food, fiber and shelter, but in the normal run of things, a good consultant can be one of the most valuable professional tools in the superintendent's arsenal. He can be a positive force. He can be used effectively in innumerable ways in order to achieve objectives and goals. He can help the superintendent become more valuable to his club by contributing to his program.

Like golf cars, turfgrass consultants are now a fact of life and part of golf. They grow in numbers with each passing year. Some are good, some are bad, some have ulterior motives, some do not, some are effective while others fail. But consultants seem to be here to stay, and it is the wise man who will use them to his advantage.

Tom Mascaro said it best when he said: "There is no way, in this life, for you and me to make all the possible mistakes by ourselves. If we are smart, we will learn from the mistakes as well as the successes of others."

A "wee bunker" on the Old Course.



What's Going on in the Field?

Panel Members: **W.B. Buchanan**, USGA Agronomist
J.B. Moncrief, Southern Director
A.M. Radko, National Research Director
F.L. Record, Mid-Continent Director
C. Schwartzkopf, USGA Agronomist
S.J. Zontek, USGA Agronomist

Moderator: **H.M. Griffin**, Mid-Atlantic Director

GRIFFIN: I don't know of anyone who has more exposure to golf course maintenance problems on a national scale than the Green Section Staff. We spend full time on the road looking at and trying to help solve turfgrass problems. Let's look back on 1975 and review the year's highlights.

RADKO: A major problem was the insect, *Ataenius spretulus*. In past years this insect caused minor problems but suddenly burst on the scene in great numbers last summer. Whether it will be here again next summer is not known. It was prevalent in the Mid-west, Mid-Atlantic and Northeast causing considerable damage. In some instances, as many as 155 grubs per square foot have been counted. Dr. H. Tashiro, of the Geneva Experiment Station, New York, will be working on the problem with others during the months ahead. I know they will be coming up with some recommendations for all of us.

BUCHANAN: Ice formation has been of considerable concern to superintendents and green chairmen this winter, especially when it develops on greens. In his winter injury studies at Michigan State a few years ago, Dr. J.B. Beard found *Poa annua* turf could remain under an ice cover for upwards of 60 days without suffering severe damage. Bentgrasses can go to 100 days without severe injury. Therefore, we urge superintendents not to become overanxious and try to remove the ice too early. Frequently, there is more

mechanical damage to greens than ice damage if early removal is attempted.

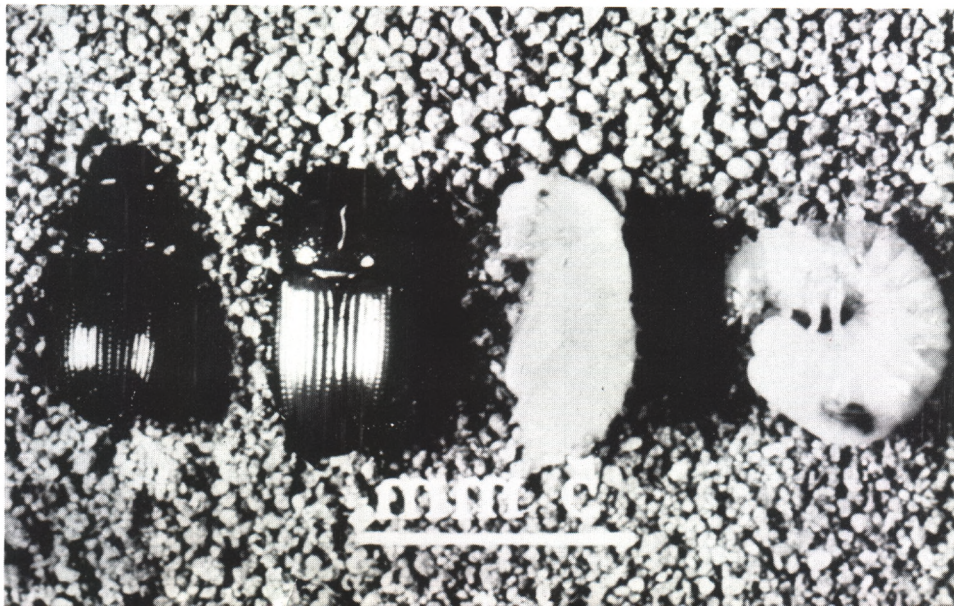
RECORD: In the Mid-Continent region this year we have had lots of snow but very little ice. Our biggest problem therefore is desiccation. You must pay close attention to it and do everything possible to prevent the drying out of soils on high places during such a winter.

GRIFFIN: In the Mid-Atlantic region, we have had some very low temperatures. In Washington, D.C., near-record lows of 7 and 11 degrees below zero have occurred. This is getting pretty cold for bermudagrass turf. We are going to find out next spring which bermudas are really winter hardy and which ones are not. We have several new strains which show promise. I think zoysia is also gaining popularity in the Mid-Atlantic region.

MONCRIEF: We have had some totally frozen bermudagrass greens in the South for the past three or four weeks. Those greens being played under these conditions may experience some bermudagrass loss next spring. This is especially true if the cup and flagstick have remained in the same place on the regular green throughout this period. When we have freezing conditions of this sort, more and more superintendents are creating a temporary target area for the flagstick and cup until normal weather conditions return.

GRIFFIN: For a moment, let's turn to the subject of bluegrasses. In the Mid-Atlantic region at least, I

Ataenius spretulus: an old beetle causing new damage.





Turning a power rake into a small dozer.

don't believe there is much of a future for bluegrasses on golf course fairways, at least with the strains we now have available. The disease *Fusarium roseum* is a major problem along with insects such as *Ataenius spretulus*. and others.

Any comments?

ZONTEK: There is no doubt we do have problems with bluegrasses. As Lee Deiter, of Washington Golf & Country Club, has pointed out, bluegrass is being forced to grow at too low a cutting height with too much nitrogen, too much water and maybe not enough other good maintenance practices, such as liming and aeration. But the researchers are continually trying to improve bluegrass strains, to improve disease controls and to develop better insecticides. I think there is a great future for bluegrass progress simply by sorting out the tremendous amount of information already available on diseases, insects, etc. and adhering to Professor Dickenson's adage, "Help the grass plant to grow; don't force it to grow."

SCHWARTZKOPF: In the Mid-Continent, the failure of bluegrass on fairways has probably been due more to the cutting height than anything else. The superintendent is being forced to cut bluegrasses too short, and this places undue physiological stress on the plant. There is also the tendency for some to overwater in order to maintain *Poa annua* during the summer. Unfortunately, many golfers believe "green is good and brown is bad." When everyone realizes the capabilities and management requirements of bluegrass, I think bluegrass will probably do very well. I have played bluegrass fairways that were cut at 7/16-inch. When I mention this to some people, they simply shake their heads in disbelief. But those bluegrass fairways were so

dense, it was almost hitting a ball off bermudagrass fairway turf. They were excellent. But we simply do not have bluegrasses available today that will very long survive the 3/4-inch or less height of cut.

RADKO: Well, I do not think we should allow bluegrasses to be knocked out of the turf manager's box. Today, there are a number of excellent bluegrasses being developed by researchers like Dr. Joe Duich of Penn State and Dr. Reed Funk of Rutgers. These bluegrasses will one day be equal to our other good grasses for fairway turf. They will survive a height of cut desired by most golfers. We are definitely working our way down to this point.

GRIFFIN: To move on to another subject, has anyone seen unusual diseases or a new disease or new insect this year?

SCHWARTZKOPF: Yes, I ran into two instances this summer where Japanese beetles were found to be resistant to insecticides previously very effective. There seems to be a growing resistance or immunity to many chemicals now in use.

MONCRIEF: Along this line, there is certainly an advantage for us in the South with the lower temperatures this winter. This will help reduce the buildup of insect populations and there should be a reduced need for pesticides and insecticides for control later this year.

SCHWARTZKOPF: Anthracnose was identified in the Detroit area last summer on some *Poa annua* fairways. Control seemed to be achieved with systemic-type fungicides. However, there was also a change in weather conditions, i.e., temperatures and humidity, at about the same time and so it is difficult to say whether the weather or chemicals brought about actual control.

ZONTEK: We have run into a lot of discussion about

the control for *Hyperodes* weevil during the past year. Our recommendation is two pounds active per acre Dursban or four pounds active per acre Diazinon applied in mid-April. A second application at the same rates should follow in mid-May. We have observed that the granular forms of these insecticides perform better than the liquid formulations. However, the liquids can do a fine job if watered in well after application.

RADKO: Another problem we saw prominently in the Northeast this past summer was pythium. Because of EPA regulations, there has been a reduction in our old standby fungicides carrying mercury. These were used for years and I'm sure helped in pythium control. Now that the mercuries are no longer in wide use, we are going to see more and more of the pythium problem. The superintendent should prepare for it.

GRIFFIN: We have had a new disease this year in North and South Carolina and Tennessee on bentgrass greens. I've never seen it before but it seems a very serious one. It develops in ring form and eats into the thatch leaving small hollows throughout the green. Fortunately it is not too widespread. It seems to last from 3 to 12 weeks and sometimes up to a full year. We've just not been able to get rid of it so far with any of the standard fungicides. Some drenches seem to have an effect as well as an application of heavy amounts of lime or an organic fertilizer. But the pattern is confusing. One thing works one time and another the next, but it is difficult to pin it down. Someone has suggested the disease is soybean root rot and there is no control for that other than crop rotation!

MONCRIEF: The farther South we go the more different strains of pythium we find. Drainage is certainly important in pythium control because it is a water-loving disease organism. So you need good drainage. We use Captan as a fungicide in the soil to try to keep the disease suppressed as much as possible. It is doing quite well and has a residual effect.

To improve disease and insect control on turf in the future, the Green Section is supporting research on electro static sprays at the University of Georgia. This technique has been used with outstanding success in row crops. We hope to adapt it to turfgrass purposes and, if successful, it may be possible to use 50 per cent or less chemicals to achieve the same degree of control. This has been the case in row crop work.

RADKO: Another interesting thing in electro static sprays is that there is far less water needed for the application. It is a beautiful thing to watch and we hope it works out well for turf.

GRIFFIN: This leads us into the area of labor saving innovations. Do any of you have a report of this subject?

ZONTEK: I have two examples of how a conscientious superintendent and his mechanic can

develop important equipment for the golf course.

Superintendent Arthur Elmers and mechanic Bill Coerper, of Preakness Hills Country Club in New Jersey, grew tired of hand shoveling sand back onto the faces of bunkers after heavy rains. They developed a blade-like attachment for the mechanical sand rake. The small, dozer-like blade pushes the washed sand back into place. Then the operator locks the blade in the up position and simply rakes the sand in the bunker in the usual manner. All of the work is accomplished without the workman's leaving his seat.

Another good idea utilizes the mechanical bunker rake and was developed by Superintendent Les Allen, of Kernwood Country Club in Massachusetts. To remove runners and overlying grass blades on putting surfaces, Les had developed a Delmonte rake attachment for the mechanical sand rake. The spring teeth of the rake roughs up the runners as it is drawn back and forth across the green, and then a regular putting green mower follows, cutting off the raised grain and nap. It works very well.

MONCRIEF: Speaking of bunkers, the Green Section's support of research on a machine to mechanically remove pebbles, rocks and other debris from sand bunkers is progressing very well. We hope to have it on display at the U.S. Open site, the Atlanta Athletic Club, Atlanta, Ga., this June.

GRIFFIN: I would like to ask the panel how they see the general outlook for play and golf course maintenance in 1976?

BUCHANAN: Play is up, and as long as we have revenue coming into the club, maintenance costs are going to have to keep pace. One point that constantly comes to my mind is the article by Superintendent Bob Williams, of Bob-O-Link Golf Club in Illinois, in the *USGA Golf Handbook*. He mentions that most clubs today have an annual gross income of about a million dollars. This comes from dues, fees, restaurant, bar, lockers, pro shop, caddies, pool, tennis, etc. It is a figure representing the total amount of money spent at a club in one year by members and guests. Now, if golf course maintenance costs average about \$150,000 a year, one can conclude that only about 15 per cent of the club's annual gross income goes to grounds and greens upkeep. Of this figure, approximately \$100,000 or 10 per cent of the gross annual income accounts for ground maintenance salaries and wages. When viewed in this light, it seems golf course maintenance operations are one of the most efficient areas in the total private club operational picture. Certainly, with everincreasing play, golf course maintenance expenditures provide an extremely poor target for the cost cutting axe.

OTHER IMPORTANT USGA GREEN SECTION NEWS:

January, 1976 was a busy news month for the USGA's Green Section:

The Associates Program

With Arnold Palmer as National Chairman, the USGA Associates Program was detailed by Green Section Chairman John L. Crist, Jr., at the Educational Conference in late January. The primary objective of the program is to provide a means whereby all golfers can become more closely identified with the USGA, the governing body of golf in our country. For the first time ever an individual may now enroll as an Associate and enjoy the satisfaction of directly supporting golf and USGA services.

President Ford became the first USGA Associate on December 18, 1975. The annual subscription is \$12 a year for an adult; \$16 for husband and wife. In appreciation of the support, those who enroll will receive a subscription to the *Golf Journal*, a current Rules of Golf booklet, a golf bag tag with his name thereon and a USGA Associates decal.

Write to any USGA office (please see inside front cover) for further details.

A.M. Radko Appointed National Director, Green Section

Alexander M. Radko has been appointed National Director of the USGA Green Section. He will head up a scientific team of agronomists in bringing the soundest turf management counseling service possible to USGA Member Clubs. A number of new activities are being planned for the Turfgrass Service of the Green Section, and Radko also plans to devote additional time to turfgrass research projects sponsored by the organization. Al Radko has been with the USGA since 1947; he served as Eastern Green Section Director for the past 22 years. USGA Member Clubs and superintendents can look forward to even greater support of their turf management operations from the only advisory agency devoted solely to golfing turf in the USA. If your club is not now a subscriber, plan to join and take advantage of the Turfgrass Visiting Service in 1976. The cost is still less than \$1 a day!

John L. Crist, Jr., receiving a check donated for the Green Section Research and Education Fund from Harry Welch and Edwin Laxton, during the USGA Annual Meeting in January.



TURF TWISTERS

PURE SEED

Question: When purchasing seed, how do you determine the percentage of pure seed that will germinate? (Ohio)

Answer: Multiply the percentage of purity by the germination percentage. This will give you the per cent of pure live seeds.

OF DIFFERENT COLORS

Question: Our greens have been constructed of native soil and sand. Unfortunately the soil was not mixed uniformly; when it becomes cold or freezes, the green presents a mottled appearance. Is this a result of the poor mixing procedure? (Minnesota)

Answer: It is possible, but not probable. The difference in the color on your greens is probably due to differences in the individual grass varieties. Some individual plants continue to grow after the cooler weather arrives, whereas others are inhibited; therefore the off-color appearance is present.

IS NOT AS EXPENSIVE AS SOME WOULD HAVE YOU THINK

Question: Approximately how much material is required to construct a USGA type putting green? (North Carolina)

Answer: The approximate quantity of material required for each 1,000 square feet of surface area of a USGA putting green is:

Tile—100 linear feet.

Gravel—12 to 15 cubic yards.

Sand—6 to 7 cubic yards.

Laboratory-Soil Mix—40 cubic yards.