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USGA GREEN SECTION RECORD

A Publication on Turf Management
by the United States Golf Association

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A well designed road enhances the appearance of the clubhouse area.

Cart Paths and Car Roads Can Be Turf Savers

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

In the beginning there was grass. Golfers then created foot paths and these later evolved into cart paths. Today they have become paved roads!

The golf car has substantially altered turf maintenance practices over the past 20 years and it has also created a new revenue source for club operation. More people are playing golf and more players are using golf cars. Clubs starting with 15 or more cars did not have a turf wear problem until they added another five or more to their fleet. Then the thinning and loss of turf appeared and it became necessary to control the movement of carts in order to preserve the grass.

The use of privately owned golf cars is a

dilemma for many club officials. The owner-member feels he is justified in using his car on his golf course. In most cases however, the fee charged for the use of the privately owned car on the course is minimal and contributes little if anything to the increased maintenance cost it creates. Fewer and fewer clubs permit private golf car use today.

The golf car has created several problems but turfgrass wear is the primary one. A two-year research project at Ohio State University during the mid-1960s studied wear on turf from various size tires. Results of this research show that a nine- to 12-inch tire caused less compaction than a smaller tire and was less expensive than the wider, 15- to 18-inch tires. The study also pointed out that compaction caused by golf cars directly restricted water movement into the soil. Increased aerification becomes necessary to relieve compaction where heavy cart traffic is found.

In the January, 1967, issue of the *Green Section Record,* James L. Holmes listed products used in building roads and cart paths. These varied from wood bark and wood by-products to gravel, shells, asphalt and even reinforced concrete. Asphalt is used more than any other product and has been quite satisfactory. Upkeep is easy and proper sealing of the surface is the key to the life of the asphalt.

So far, car paths (or roads if you prefer) are built only on courses not able to maintain enough turf to prevent thin or bare areas. The income that may be realized from continuous use of cars should be a very important factor in future building of roads. If adverse weather restricts use of cars, income for that period is reduced. With proper construction and location of roads, continuous use of golf cars is assured.

One drastic change in the building of roads in recent years has been that of road width. Early roads were only wide enough for golf cars, but it is now common for them to be eight feet or more in width. Indeed, in many cases the roads are used for the movement of maintenance equipment or delivery trucks throughout the golf course. Many asphalt machines can be set for eight feet and paving jobs can be completed faster if the road width

Roads should be constructed to divert water, not collect it.

Crossing public roads is hazardous and may require tags.

is the same as that of the machine.

Developing roads from the first tee through the 18th green also seems to be on the increase, especially in areas where wet conditions prevail. I know of one course that had a limited road system at first, and then constructed a continuous system through all 18 holes. Golf cars were restricted to the roadways and not permitted on rough or fairway areas. A temporary decrease in income was experienced, but as soon as the policy was accepted, play actually increased. Overall, however, the most acceptable use of roads has been during adverse weather and the free use of the golf course during favorable weather.

It is difficult to say where a golf car road should end, but it should begin where traffic converges and wear is evident. A road can always be extended, especially if turf is worn out for a distance beyond the end of the road. Directing traffic at the end of roads can be done with Y's, curves, ropes, moveable barriers or signs. Using a gentle curve (away from the intended flow of traffic) is very effective because it spreads the wear over the extended arc of the curve. Rather than exit at the end of the road, the driver will tend to follow the road until he becomes aware that it is leading him away from his intended path.

Curbs are also effective traffic controllers, especially near tees. A golfer will often pull off the road and park on the turf adjacent to the teeing ground. We are all creatures of habit and and, even in a golf car, tend to obey state and federal highway laws. Unconsciously, the golfer pulls off the asphalt on the right side of the road and onto the turf. A low curb will remind him to stay on the road and save the grass.

When building roads, make sure they drain properly so that water will not collect in low areas. Plan drainage so that water will not drain where traffic will exit the road nor where drainage will cause erosion at the end of the road. On the other hand, golf car roads may

also be used as surface drainageways under certain circumstances. But again, handling the water at the end of the path must receive careful study.Roads generally should be flush with the turf so that mowing may be accomplished easily and maintenance equipment can move across freely, or along the edge of the road.

It is advisable to keep gravel, crushed rock and similar material off the turf and on the golf car road. Rotary mowers will sling a rock for some distance with considerable force. If a reel-type mower is used, there will be bending or nicking of blades which effect the operation of the machine and appearance of the turf. These surfacing materials can be kept in place better if soil is excavated prior to the construction of the roadway.

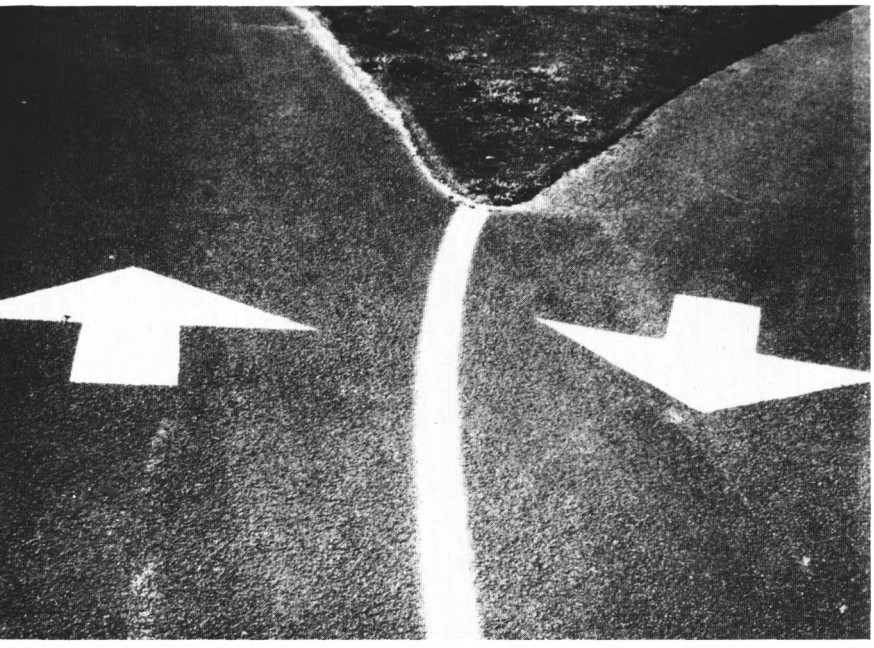
Cypress bark has become quite popular in Florida, and other wood products are frequently used for road surfacing. However, heavy rains cause a problem with these materials and the bark has to be put back in place after each rain. At the end of the roads, bark has a tendency to move onto the turf area and has to be replaced. During dry periods there is frequently a dust problem with this material, although nearby irrigation outlets—if available—will minimize the problem.

Those soils having a high percentage of clay or silt particles compact readily and particularly when wet and under heavy traffic. This condition often calls for an immediate and important decision. Should the signs go up "no carts today," "carts in rough only," "carts on roads only," or "free use of golf carts"?

Situations of this sort are delicate matters under certain circumstances. Across the South where we do not have deep freezes or heaving soil, the best way to counteract compaction is with aerification equipment. Hybrid bermudagrasses withstand more wear, but they suffer if compaction is not relieved occasionally.

Courses built on hilly terrain do not always have free choice as to whether or not golf car roads should be constructed. Spinning wheels going up a sharp grade will cause loss of turf which results in erosion and bare areas unsightly on the golf course. We hear many comments that, "We will not have golf car roads on our golf course." However, if a thorough study is made of location, and if the work is carefully and properly done, roads are

Obeying the law? Pull to the right!



Simple, neat indicators are often most effective.

not too unsightly after they have been in place for several months. They definitely keep cars rolling 12 months of the year and more income for the club is realized.

Costs of construction vary from community to community and no estimates can be given here. Local paving companies will give estimates as to thickness of foundation and installation costs. Width of the road is another factor.

We can summarize by saying that if golf courses are used 12 months of the year and if the turf manager has difficulty in growing good turf because of heavy traffic, roads are essential. Start construction in those areas where there is no doubt about proper road location. Where there is a doubt, study the situation to the fullest, for once a road is developed it is quite difficult to move. The type of material used may depend on the source and aesthetic appearance you want in the scheme of the golf course and around the clubhouse. Roads can be turf savers.

Certification for GCSAA Members

by CLIFFORD A. WAGONER,

Secretary-Treasurer Golf Course Superintendents Association of America

The launching of a certification program by the Golf Course Superintendents Association of America — the only internationally recognized organization of golf course superintendents — opens a whole new frontier for the profession.

The implications of such a program are far-reaching, offering outstanding career advantages that will mean greater recognition, job stability, higher income and increased opportunities to the golf course superintendent.

Nearly three years in the planning, the GCSAA certification program marks a major image change from yesteryear's "greenkeeper" to the vast storehouse of scientific and managerial skills that a superintendent must have today.

Officially announced to the membership in June, the program's primary objective is to provide a long-needed "standard" for measuring the capabilities and qualifications of a superintendent. Club officials and other interested persons in the golfing world will now have a reliable set of standards to follow. Significantly, they are standards set by golf course superintendents themselves rather than by people less knowledgeable about their profession.

The entire program was developed and assembled by Director of Education, Dr. Paul M. Alexander under the guidance and direction of the Association's Certification Committee and GCSAA Executive Committee.

GCSAA members who are eligible for certification are those who are: (1) currently employed as golf course superintendents and (2) have held Class A membership for at least three years.

A tenure and experience provision is also available for all qualifying members. They must have held Class A status for 20 years and have been employed as golf course superintendents for the same number of years. These members are not required to take an examination if they apply in writing before September 1, 1973.

The written examination is divided into six major categories. Each segment covers important points of knowledge and skills needed by top superintendents. Among them are turf culture procedures, plant protectant chemicals, business administration, management, rules and game of golf, and understanding of the GCSAA.

Each part of the examination is graded separately and a passing grade is required in each classification to achieve certification.

If a candidate fails any part of the exam, he may retake those portions at a later date. He will not be required to pay an additional fee for

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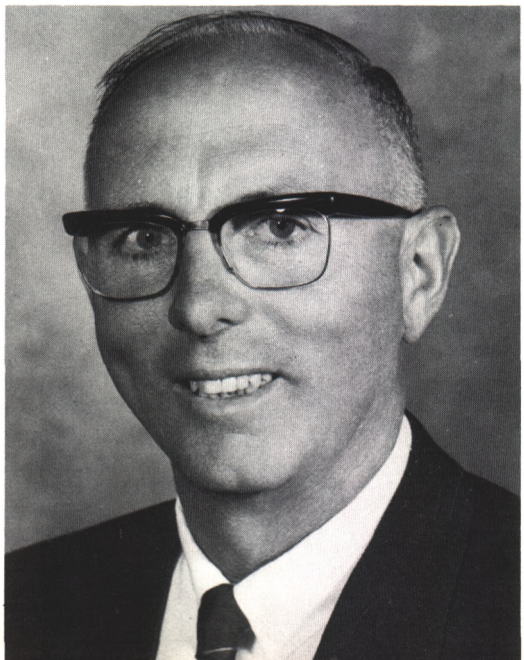
ABOUT THE AUTHOR

CLIFFORD A. WAGONER is superintendent at the Del Rio Golf and Country Club, Modesto, Calif., where he began his career in golf turf maintenance in 1946. He has also held the superintendent's position at two other clubs, but returned to Del Rio in 1954. He has served in GCSA of Northern California as President, Vice President, Secretary and Director; he has also been President, Vice President and Director of the California Federation of Golf Course Superintendents Associations. He is also a member of the Northern California Turfgrass Council and the USGA Green Section Committee. Wagoner has served on the Executive Committee of the GCSAA since 1968 and has been a member of the National Association for the past 14 years.



re-examination if he successfully completes all six parts of the exam within one year from the date he began testing.

Applicants may prepare as long as they like for the examination. Once the candidate feels he is ready for the examination, a date will be set that is mutually agreeable to him and an official monitor in his area. The one important source a candidate will use to prepare for certification will be study material that is provided by the GCSAA upon receipt and clearance of his application.

Since today's golf course superintendent must keep abreast of all current discoveries in the research and development of turfgrass science, new equipment, and improved business techniques, re-examination will be required within five years after completion of his first certification test. In addition, superintendents are required to maintain their membership in GCSAA and remain actively employed in their profession. They must also complete one regional GCSAA workshop or successfully complete a GCSAA-approved turf management correspondence course.

There is more to the certification program than the obvious benefits to the superintendent. The program also has both inherent and potential benefits for club owners and officials, club members, golfers and all other agencies concerned with golfing. Eventually, these across-the-board guidelines for superintendents may lead to establishing similar guidelines in turf management education. What a full scale accomplishment it would be if the nearly 200 schools that have reached no common ground of agreement on the basic courses offered in turf management would soon enjoy a standardization of curricula.

Certainly there is no guarantee that certification will improve the performance of the individual superintendent. On the other hand, it does unmistakably define the level above which any given superintendent can be expected to perform. In the final analysis, the superintendent who has successfully completed the entire testing program can clearly be expected to perform in accordance with those professional standards that accompany the title "Certified Golf Course Superintendent."

SUPER SAM by Paprocki

The Irrigation System and the Use of Soluble Fertilizers

by MAJ. GEN. JOHN L. WINSTON and JOHN R. HARDIN,
Green Chairman and Assistant Green Chairman, Somerset Hills C.C., Bernardsville, N.J.

Most golf courses today have an irrigation system — either manual, semi-automatic, or fully automatic. There is no other equipment on the golf course which can cover the turf area as simply and as accurately as a well designed irrigation system. It follows, therefore, that it can and should be used for purposes other than irrigation — primarily the application of plant food, and secondarily the application of fungicides, pesticides, and herbicides.

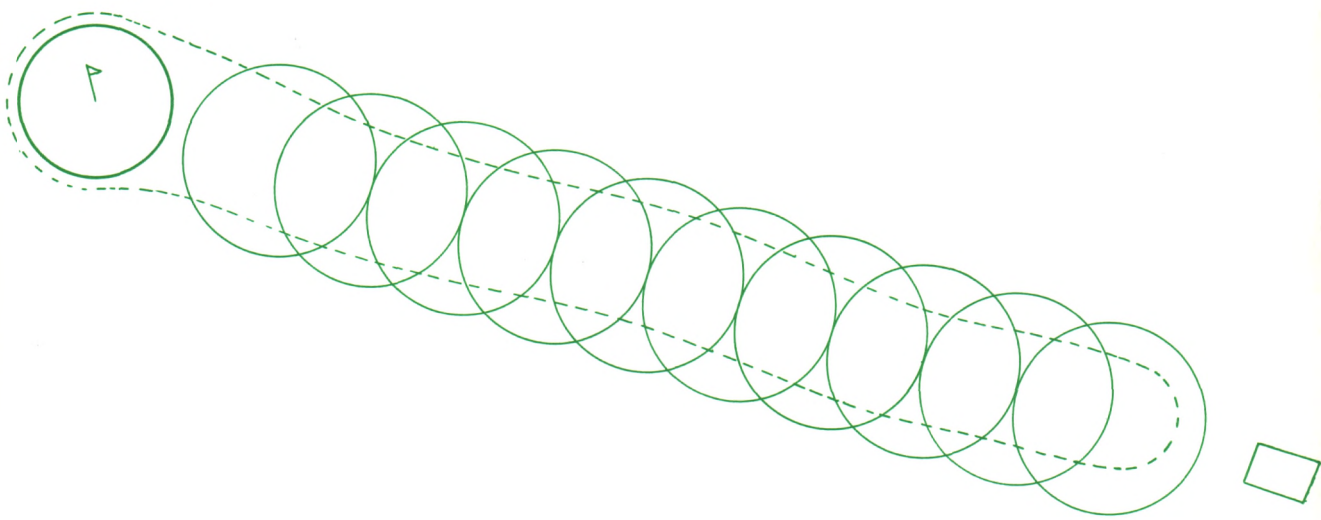
Recommendations for seasonal application of materials in dry form, even with modern equipment, are almost impossible to follow accurately, adequately, or economically. For many years it has been acknowledged that frequent feeding of turf grasses in small quantities gives better results than fewer feedings in larger quantities. The irrigation system is ideally suited to this. As to the mechanics of this type of application, there are many ways of introducing a concentrated solution into a main line or even a branch line. Many types of proportioning and injecting devices are presently in use.

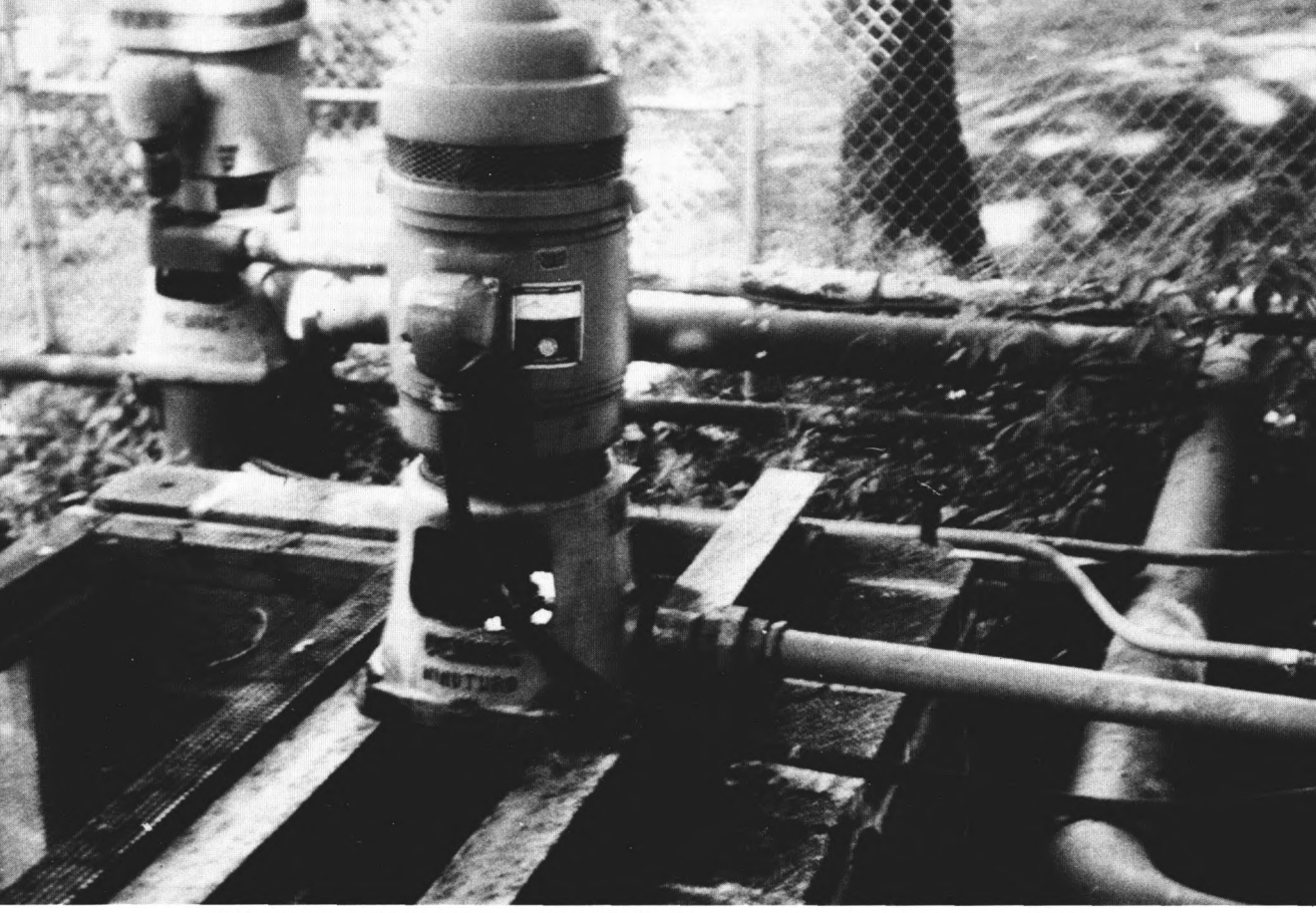
The irrigation system at Somerset Hills Country Club was installed in 1936. Although old-fashioned by today's standards, it is ideally suited as a liquid fertilizer applicator. The system is fed from a pond on the course. A 60 horsepower shallow-set 24-inch turbine pump is set at the pond's edge, and the impellors are set in a sump 12 feet below water level. There is also a small pump and a large pressure tank which keeps water in the lines at all times. Both pumps are controlled by pressure switches which operate on demand.

With respect to our fairways, there are no automatic sprinklers. Kicker type sprinklers are manually screwed into the heads which, starting at the edge of the green, are located at intervals of 100 feet, down the center of the fairway (see Photo 1).

Figure 1 illustrates a par-5 hole, 527 yards long. There are ten heads, and it is representative of an area we fertilize at one time, since the capacity of our pump is about ten sprinklers with efficient pressure. The diameter of the circle covered by each sprinkler is about 180 feet. With the sprinkler at the green covering a half-circle and the rest a full circle, the approximate area covered is 180,000 square feet. Our fairways average about 120 feet in

Figure 1.





The pump used in feeding the water onto the course through kicker type sprinklers.

width. Approximately 120,000 square feet of fairway is covered, and the fertilization reaches a short distance into the bordering rough which is cut quite short, the width of a five-gang mower. It is to be noted that Figure 1 shows overlapping circles, and one would think that parts of the fairways would get an overdose and other parts an underdose. It has been our experience, however, even though we do not fertilize in more than light winds or at night, that there is sufficient drift or spray to make the application even.

We have installed two 50-gallon steel drums which lie on their sides in the pump house at the pond. A large hole has been cut on top to put water and fertilizer into the drums. At one end of each drum is a valve and hose leading to the sump (see Photo 2).

Proper amounts of fertilizer for the area to be covered are thoroughly stirred with water in the drums and the valves are opened to a pre-determined setting to meter the liquid into the sump over a 45-minute span. From the sump it is pulled into the system by the running pump along with great quantities of water from the pond.

We estimate that by the time the fertilizer reaches the sprinklers the concentration of nitrogen by weight is one part to 5,000 or more parts of water. In any event, we have never had a trace of burn.

Nitrogen is obtained from urea which comes in a water-soluble granular form of 45-0-0 content. Potassium comes as water-soluble muriate of potash of 0-0-62 content. We have not been applying phosphorus to our fairways (on the recommendation of the USGA Green Section to discourage stimulation of the *Poa annua*), but it is also available in soluble form.

Now, as to the amount of fertilizer applied. The entire golf course is fertilized five times each year in the latter part of May, June, August, September and October. This, of course, can be increased to six, seven, or more times, or various portions of the course may be fertilized individually. The amount of nitrogen applied annually is 1¼ pounds per 1,000 square feet, or 54½ pounds to the acre. The amount of potassium is 0.46 pounds per 1,000 square feet, or 20 pounds to the acre.

These figures turn out to be convenient in many ways. For our 18-hole course, a purchase

Two 50-gallon steel drums where water and fertilizer are added in the pump house.

of 3 tons of 45-0-0 urea covers us for the season. A purchase of one ton of a 62 per cent muriate of potash also handles one season. It is also convenient for our greens crew because they know that for each head, 10 pounds of 45-0-0 and 3-1/3 pounds of potash are used for each application.

To help our men determine the proper amounts of material to mix in the metering drums, a large chart picturing the holes in the order of application, by section with number of heads, is posted in the pump house. For example, our ninth hole, par-5, 10 heads, comes first; our first hole, par-4, 10 heads (parallel to No. 9), comes second; our second (two heads), third (6 heads), and eighth (2 heads), which are contiguous, and total 10 heads, comes third; etc. Not all areas work out exactly, varying from seven to 10 heads, with the total sections amounting to 13. One of these sections includes the six grass tennis courts.

On the basis of five applications per year, a total of 5,650 pounds of nitrogen 45-0-0 fertilizer is used. At a cost of $125 per ton for 45-0-0 urea, this amounts to $375 with an allowance for overage. One ton of muriate of potash at $70 brings the total material outlay to $445.

Labor costs are more difficult to pin down, but by giving an example of the procedure, some conclusions may be reached. Using the previously mentioned ninth hole as a starting point, the operation goes as follows:

F (Fertilizing hour)

1. F minus 15 minutes — mix the proper amount of fertilizer and water in the drums.
2. F hour — set out sprinkler heads and turn on fertilizer hoses to pump.
3. F + 45 minutes — barrels are empty, shut off hoses.
4. F + 45-60 minutes — mix new batch for next stand and leave heads on first stand to flush line.
5. F + 1¾ hours — move heads to next stand and turn on fertilizer hoses.
6. Repeat process as from Number 3 on.

This operation may be accomplished by *one man,* but we use two so that the one changing heads can watch them for any malfunction. A set of walkie-talkies would be useful in this connection.

We are convinced we are saving in labor costs over dry form mechanical spreading. For a club with a more automatic system even greater savings should result. We must also bear in mind that, more often than not, when we fertilize, the course happens to need watering anyway, and where this is the case, our labor factor is practically zero.

IN CONCLUSION: It has been argued that fertilization through the irrigation system results in merely leaf feeding. We refute this by indicating that where our ninth hole with its 10 heads receives treatment, the 180,000 square feet area is doused with 30,000 gallons of fertilizer and water and an additional 15,000 gallons of plain water. This does not lie on top but penetrates into the root system. To prove this, after six years of liquid fertilizer only, plugs taken from No. 9 showed strong, healthy roots 14 inches deep.

This year is our seventh season of fertigation, or hydrogation as fertilizing through the irrigation system is sometimes called, and results have been most gratifying.

Because of the need for storage space for tons of dry fertilizer, one club purchased a used trailer for this purpose.

Golf Shoe Spikes— Who Needs Them?

Professional Wendell Wood and Superintendent John Zoller agree, "Golf spikes damage turf and soils."

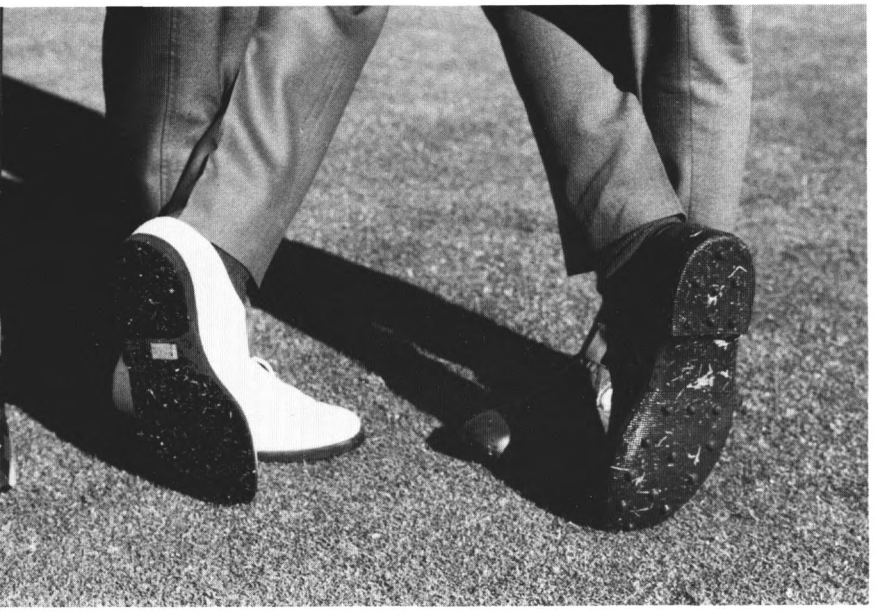
by **WENDELL E. WOOD** Golf Professional, Eugene Country Club, Eugene, Ore.

At the risk of knocking down a hornet's nest, I feel it is time to again challenge one of the greatest frustrations in golf today — the spike on the golf shoe. Small and inconspicuous, the spike should also be considered expensive and destructive. It is difficult to understand why the spike has been tolerated so many years, particularly in view of heavy play and ever increasing traffic on the golf course.

In 1970 the National Golf Foundation reported that $3 billion was spent in golfing activities. If the Foundation's projected increases in the number of players and number of rounds of golf in the future is to be realized, many new courses will be needed and maintenance of present ones must be improved. Anyone who has played a municipal or public course (or a private one with heavy play) is aware of the almost impossible task of maintaining putting green turf of decent quality under the onslaught of spikes.

In the late 1950s the USGA Green Section conducted interesting and revealing research on this subject. Proven beyond any doubt was the fact that today's conventional golf shoe spike is the most injurious of all footwear to putting green turf *and* soils. By a "conventional spike," I mean the one with a rounded shoulder at its base and not recessed into the sole of the shoe. Surprisingly, some feel the damage this type of spike causes is more serious to soils than to putting green grasses. Grasses will heal over, but the injury to soil structure is obviously quite lasting. In fact, one soil authority commented that it would be difficult to design a more effctive compacting device than today's conventional golf shoe spike! The spike and shoulder (there are 12 of them on every golf shoe) have been likened to a minature sheep's foot roller. In spite of all the facts and the evidence seen by golfers on every green, the spike persists where it should be outlawed.

It is understandable that a satisfactory substitute must be made available to the golfing public if the spike is to disappear. The Green Section Research Project proved that spikes with a flat, recessed shoulder or some other type of designed sole will give solid footing without the high degree of turf wear. Rubber soles formed by a series of many soft ripples

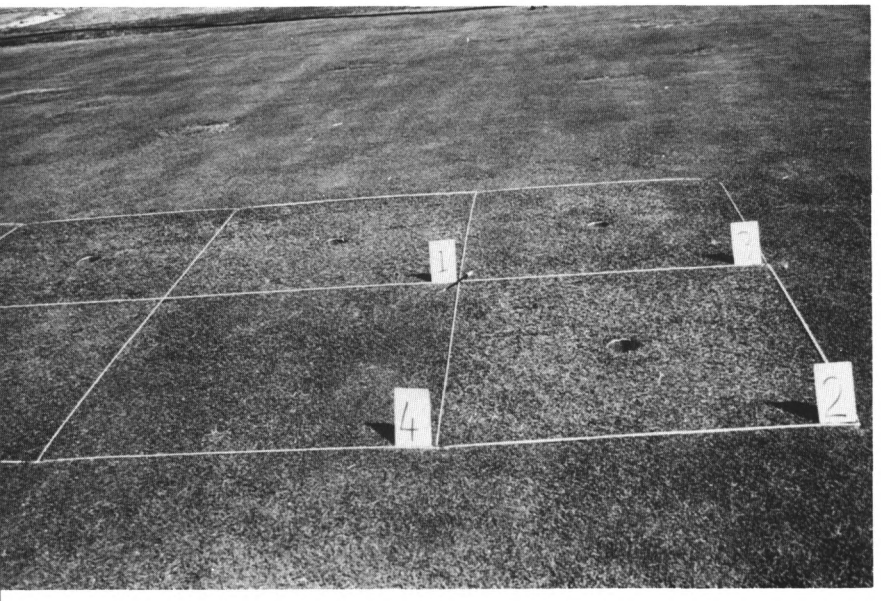


There are many types of modified footwear that will give excellent purchase to the turf.

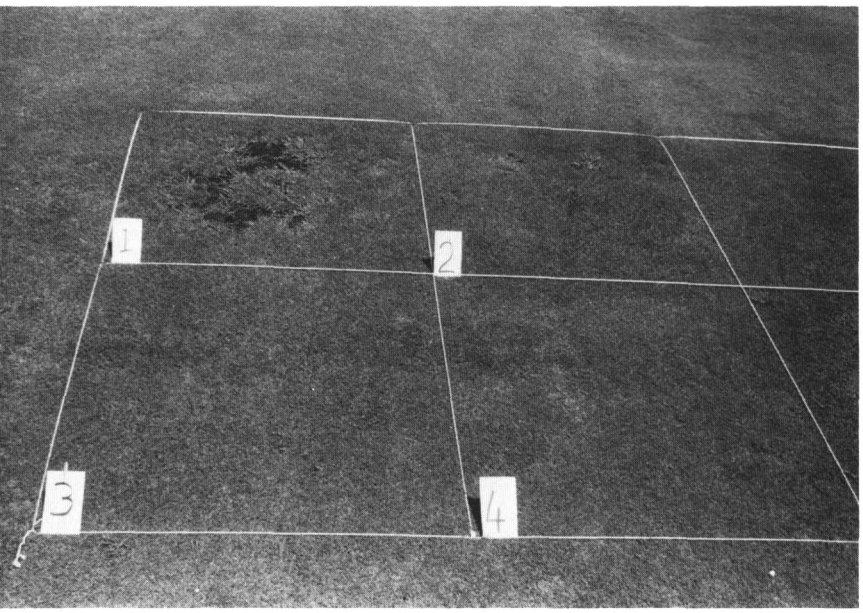
give excellent purchase to the turf, very similar to a basketball shoe. Rubber soles with inverted cups also afford excellent traction. Efforts are now being made to interest golfers in these shoes. After all, Bobby Jones accomplished his grand slam before the advent of the extra long and replaceable spike. Although there has not been a rush by golfers to the modified spike or rubber sole shoe as yet, our number of advocates grow each year. More and more golfers are becoming disenchanted with bumpy, worn greens and tees. Our numbers are on the increase!

From the standpoint of playability alone, the number of putts missed due to spike marks confronts every golfer on every golf course. John Zoller, our golf course superintendent, believes that the quality of course condition, the potential great financial savings in course maintenance from compaction, and general wear and tear are sufficient reasons for abolishing the golf spike. Indeed, it might even be feasible to design greens of smaller size with fewer hole locations if the wear problem from spike shoe traffic were eliminated. Consequently, golf course construction and maintenance costs would be cut by millions of dollars.

We will find support for our anti spike stand from every club manager as well. "No spikes please" signs are seen in many clubs. They are



The Green Section experiment in 1959 illustrates the effect of shoe soles on turf. This picture shows a test plot of Seaside bentgrass after five weeks of putting 10 minutes daily in each square: #1 regular golf shoe spikes; #2 modified spikes (i.e., spike shoulder flat and recessed into shoe sole); #3 rubber soles; #4 check plot.



A duplicate plot of the experiment area six weeks after the end of putting traffic. Plot # 1, where the conventional spike was used in this case, has not recovered. Soil damage seems longer lasting than grass damage.

there to save floors, carpets and even concrete entryways. Think of the annual savings possible by reduced wear and tear in clubhouses, locker rooms, golf shops, furniture, on walking bridges, electric carts, etc., if the golf shoe spike were no more.

But what can anyone do about the problem? It may be possible that players on the professional tour would welcome the absence of golf spikes when a satisfactory substitute is found. Clubs capable of entertaining major golf tournaments may be more inclined to welcome them if abuse to the course from players and gallery alike could be reduced.

To get the "No Spike Campaign" off the ground, an approach on a regional basis seems necessary. A state or regional golf association, with all members and all clubs unanimously participating, would be a great beginning! Given reasonable support by influential golf interests and a reasonable time for transition, all 10,000 courses throughout the land could bring an end to the golf shoe spike as we know it today. With golfers and clubs concerned with reducing costs and yet maintaining the very best in playing conditions, those of us who believe in the demise of the spike may find added support. Think of it; with the spike's departure, we will not only have better golf, we will have it for less money.

In another experiment, different shoes were worn in walking over the same path (Seaside bentgrass) daily for a month. After a total of 630 traverses, these are the results (left to right); Path #1, conventional golf shoe spikes; Path #2, lug soles; Path #3, rubber soles.

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SEPTEMBER 1971

TURF TWISTERS

LASER BEAMS

QUESTION: I've heard about plastic drain lines being installed with the aid of laser beams. Does it work? (California)

ANSWER: Yes, but the laser beam is only used to establish and maintain a precise grade for the drain line installation. A light detector mounted on the tractor receives the laser beam and controls plow depth as a plastic draintube is pulled into the soil. Using the new corrugated, flexible plastic tubing, drain lines may be rapidly installed in this manner and with the proper amount of fall.

NOT QUITE READY

QUESTION: For the overseeding of bermudagrass greens, I've heard some talk about Medalist 2. What is it? (Alabama)

ANSWER: This is a seed mixture of Pelo and NK-100 ryegrasses and is believed superior to common ryegrass for overseeding purposes. There has been a scarcity of seed in the past, but it should become more plentiful as seed production increases.

FOR GYPSY MOTHS

QUESTION: The Gypsy Moth was a serious pest and defoliated many trees in New England in 1970 and 1971. How was it introduced into this country? (Mass.)

ANSWER: In about 1869 a naturalist who was a resident of Medford, Mass. introduced a few egg clusters of the Gypsy Moth for the purpose of conducting experiments on silk culture. Some moths escaped during the experiment. For the next few years a careful check was made to destroy any that could be found. They thought they had destroyed all of them. About 20 years later, the neighborhood was invaded by swarms of caterpillars which were later identified as the Gypsy Moth. Its slowness in getting a foothold was later attributed to forest fires, insectivorous birds and other natural enemies. In 1970, DDT was banned in several states and severe defoliation of forests resulted. The beauty and attractiveness of most cities, residential areas, and golf courses depends on the strategic use of trees. We trust, therefore, that satisfactory controls will be found.