



Attractive service barn at Ohio State is designed for efficient operation.

golf committee. Here is the comparison with Iowa, Stanford, Yale and Minnesota. Michigan, the other Midwestern university with golf accommodations comparable to Ohio, operates on a straight greens fee basis and does not provide similar locker-room and clubhouse facilities:

	Ohio	Iowa	Stan- ford	Yale	Minne- sota
Faculty	\$30	\$20	\$90	\$40	\$20
Students	\$20	\$15	\$90	\$25	\$20

Transportation to the course from the campus will be by busses, operated free for students by the university. At the start, two busses will be used but others may be added if the traffic demands.

Robert Kepler, a former Ohio amateur champion and graduate of the university, is a full time instructor in the department of physical education, and is assigned to golf. Kepler has a potential class of 15,000 and as soon as the course is in play will have an assistant. Bob began his golf instruction this winter but his eight classes filled so rapidly that it became a problem to satisfy the demand. Kepler will give group instruction on the course, as well as coach the varsity golf team, and these lessons will be free as a part of the physical education program.

As a feature of the course opening, it is likely the Spalding exhibition troupe of Horton Smith, Harry Cooper, Lawson Little and Jimmy Thomson will be the first to test the caliber of the Ohio fairways. There also is a chance that no less a personage than Robert Tyre Jones, jr., may join in the celebration.

In the words of the late Dr. MacKenzie, "an ideal golf course must be pleasurable to the greatest number of players. It must require strategy as well as skill, otherwise it cannot be enduringly interesting. It must give the average player

a fair chance and at the same time require the utmost from the expert, who is trying for sub-par scores. All natural beauty should be utilized and a minimum of artificiality introduced."

That is the Ohio State course. And the course will stand, in time, as a monument to the foresight of Lynn W. St. John, who saw in golf a finer instrument for the physical and mental betterment of the greatest number.

Don McKay Elected to Head Connecticut Supts.

I 938 officers of the Connecticut Assn. of Golf Course Superintendents who were elected March 7 at the annual meeting held at the Brooklawn CC, Bridgeport, are: Pres., Don McKay, Hartford GC; V. Pres., H. Grahame, Putnam CC; Secy.-Treas., Charles Traverse, Mill River CC; Asst. Secy.-Treas., A. Lentine, Tumble Brook CC. Wm. E. Perkins of Yale U., New Haven, was elected to the board of directors for a term of 3 years.

Sixty-six members and guests heard the speakers, who followed an exceptionally fine dinner with some very interesting, informative talks. Dr. M. F. Morgan, Conn. Agricultural Exp. Station, New Haven, spoke on the relationship of fertilizer against the use of arsenate of lead in the control of the Japanese beetle. C. W. Baker, of F. H. Woodruff & Sons, Milford, addressed the group on putting green grasses; other speakers included H. Cliff, Bridgeport Supt. of Parks; R. A. Leckie, Bridgeport, and Robert Pryde, Racebrook CC, who spoke on his trip around the world and showed moving pictures of his travels.

Twenty-five of the Connecticut Assn. attended the Massachusetts Recreation Conference this year, Secretary Traverse reported.



Philadelphia's turf interest is indicated by this fine turn-out for the local GCS dinner.

GREENS "OPEN" HELD AT PHILADELPHIA

ONE hundred four greenkeepers, chairmen, and other turf experts attended the special Open Meeting conducted by the Philadelphia Assn. of Golf Course Supts., held March 7, at the Penn AC. Object of meeting was to collect and bring into the open the puzzling turf problems of greenkeepers in the district, hoping that the answers to these questions would bring out many new ideas and offer proved solutions to some trying turf problems. This proved very much of a success, as questions were plentiful and furnished ample food for thought.

Joseph Valentine, Merion Cricket club, and president of the assn., got the meeting under way with a talk on the major troubles of the greenkeepers of that area, with emphasis on his particular problems. Chinch bug attacks were so bad on his course last year that they were forced to close during the winter months. Experiments for the control of this pest were told the greenkeepers. Dr. Howard B. Sprague, of the N. J. Experimental Station, spoke on *Poa Annua*, which was especially interesting because Philadelphia district courses have more than an average share of it. Dr. Sprague stated that the best time to discourage the annual was at the height of summer when it was in an unhealthy condition.

Fred Grau, Penn State College, gave a talk on his trip abroad and illustrated his

words with slides. He pointed out that it was foolish to try to copy greenkeeping methods from "the other side" because the conditions are so unlike ours. Prof. J. C. Pepper, PSC entomologist, made a very interesting talk on bugs and emphasized the great need for research work in this line.

Frank Hardt, USGA Secretary, and chairman of the USGA Green Section, cited figures on the size, cost, and general information on golf, taken from the "The Golf Market," published by the GOLFDOM-GOLFING organization. The USGA Green Section committee is working to restore the Green Section Bulletin, Hardt said, and added that government money may be secured to help in the research work.

Henry Strouse, president of the Philadelphia Golf Assn., gave a short talk, and pepped up greenkeepers considerably with these words, "This is one of the finest meetings I have ever attended as regards the betterment of golf courses. At our next meeting I will convey the information on what our greenkeepers are doing in order to have their courses in better shape for the members." Hugh Clarke, of Penn State College Board of Trustees, said that "the next time my putt doesn't fall, I will realize why right away and stop blaming the greenkeeper."

DEATH OF WALTER HARBAN

GREAT LOSS TO GREENKEEPING

By
JOHN
MONTEITH, JR.

WALTER
S. HARBAN



ON March 12th death closed the score book of another great friend of golf —Dr. Walter S. Harban. His was a record of good sportsmanship and devotion to the "spirit of the game" that would at least equal any of golf's

best score cards. Dr. Harban's concept of the "best interests of the game" was no narrow interpretation limited by tournament rules and abstract mutterings of "sportsmanship." Dr. Harban recognized that the rank and file of golfers deserved some consideration in clubs as well as the small number of best players. At the same time he realized that the greatest enjoyment and best interests of the game included not only consideration of rules and regulations, but also involved course maintenance, since in no major outdoor game is the condition of the playing area as important to the full enjoyment of the game as it is with golf.

An Early Golf Enthusiast

Dr. Harban moved to Washington in the '70s and soon became one of the city's leading dentists. At one time he was the personal dentist of President Theodore Roosevelt. He retired from the dental profession in 1909 and became active in banking and the hotel business in Washington.

Throughout his life Dr. Harban was active in many outdoor sports particularly golf, rowing, hunting and fishing. He took an active part in the organization of the Columbia CC and in the construction of its present course. He later became in-

terested in the organization of the Burning Tree GC and served on its green committee. From 1915 to 1919 he was a member of the executive committee of the USGA, and Vice President from 1917 to 1919. He served on the Green Section committee from the time the Green Section was established until his death.

Dr. Harban was fond of fishing and hunting. He was a close friend of President Cleveland and frequently accompanied him on fishing trips. In recent years he was unable to play golf but continued his duck hunting as health permitted.

Applied Science To Turf Upkeep

Dr. Harban made his greatest contribution to golf through his awakening of interest in the possibilities of applying science to the maintenance of turf on golf courses. Directly or indirectly the development of the vegetative planting of bents on golf courses, the establishment of the Green Section of the United States Golf Association, the control of turf diseases and other turf maintenance problems can be traced largely to his interest and influence.

When Dr. Harban retired from the dental profession he devoted much time to the maintenance work of the Columbia CC. He encountered several problems which



This photo records an important event in greenkeeping history. The time: 1918. The place: Potomac Park, D. C. The event: workmen preparing creeping bent stolons for application for the first time to a putting green.

baffled him so much that in 1910 he sought aid from scientists of the U. S. Dept. of Agriculture. This is believed to be the first case where the help of agricultural science was sought for golf course construction or maintenance.

Some time later Dr. Harban again visited the Dept. of Agriculture and there met Drs. C. V. Piper and R. A. Oakley who were at that time interested in turf for golf courses. He immediately took these gentlemen out to the Columbia CC and thus began a long friendship with far-reaching effects on turf maintenance.

The leadership of Dr. Harban with the support of other prominent golfers with vision and broad concepts of the game finally resulted in the formation of the Green Section of the USGA. The primary purpose of the new organization was to make directly accessible to golf clubs all pertinent scientific information that was available in the U. S. Dept. of Agriculture.

Introduced Stolon Method of Bent Planting

In addition to playing a most important part in the establishment of the Green Section Dr. Harban was primarily responsible for another far reaching development in turf maintenance. This was the application of the stolon method of planting bent grasses.

In the early days of the World War Dr. Harban one morning read headlines telling of the blockade of German shipping. He immediately recognized the significance of that announcement to golf in this country. He realized that the European bent grasses were the only practical grasses for putting greens throughout our northern states. The blocking of shipments of German mixed bent seed and the ultimate reduction of the New Zealand source due to

war he knew would effectively eliminate commercial bent seed supplies. He realized that worthless substitutes would be inevitable.

As soon as he finished his paper Dr. Harban called for his car and drove to the Dept. of Agriculture. There he discussed with Drs. Piper, Oakley and Kellerman all known sources of bent seed and possibilities of their expansion. Other grasses that might possibly serve well in the emergency were also discussed. When it became evident that no new sources of bent seed nor satisfactory seed substitutes were likely to be available in a reasonable time, Dr. Harban made an important suggestion. He proposed that a test be made to determine whether some vigorous strains of creeping bent might be planted by the stolon method, similar to the manner of planting Bermuda grass.

He knew of certain outstanding patches of this grass on the Columbia putting greens. Samples of these he offered to deliver to the Arlington experimental farm if the scientists there would plant them and try to develop satisfactory methods for reproducing them in turf. This was done and it was found to be a much easier process than had been anticipated. By 1918 sufficient stock had been developed at Arlington to plant five greens in the new municipal course in Potomac Park, in Washington. The 9th green at the Columbia CC was the first green on a private course to be planted with this method.

Emergency Method Proves Best

Thus was started as an emergency process the vegetative method of planting creeping bents. Little did those four realize that when the emergency of war was over the process would continue in use,



Dr. Harban (extreme left) watches workmen applying creeping bent stolons to a putting green of a private course—the ninth at Columbia CC, Washington, D. C., 1919.

and before the death of all four of them, that method would provide efficient and enjoyable turf to many thousands of golfers on literally thousands of putting greens.

As the writer last heard Dr. Harban recount that conference and its development and watched the characteristic twinkle in his keen eyes as he heard of continuing interest and satisfaction in that method of propagation, it was quite apparent that he treasured that suggestion as one of his great prizes—greatest to him because other golfers enjoyed it. His mantel full of trophies seemed insignificant when compared with that accomplishment “for the good of the game.”

Harban Pioneered for Brown-Patch Research

Still another advancement in turf maintenance centered around Dr. Harban. In 1920 the National Open was played on the Columbia course. Dr. Harban had left nothing undone to produce the best possible putting greens for the event. Just before the tournament started the turf was acclaimed the best it was possible to produce. Then the weatherman turned loose a short period of the hot humid weather for which Washington is well known. Brown-patch won on every green and finals were played on what were essentially sand greens. Here were greens where nothing had been spared to make them the best and where the most effective methods of maintenance known to date were employed. Yet the result was a complete failure in the face of a most important tournament. The spectacular collapse of

those greens naturally focused attention on the why and wherefore of the injury, and Dr. Harban led the cry for a thorough investigation of the cause of this damage and for the development of some remedy. Then followed the investigation work on turf diseases by the U. S. Dept. of Agriculture and the Green Section, leading to the development of remedies which are now used from coast to coast and in foreign lands as well.

Greenkeeping His Major Interest

Dr. Harban was a gentleman in the true sense. His golf was more than a game for his own enjoyment, for it included years of service to his fellow club members as well as to hundreds of thousands of players to him unknown. His was a democratic golf, reminding one of some of the traditions of the game. Only a few months before his death he met a greenkeeper on the street who had never had the opportunity for even elementary schooling. Dr. Harban begged him to “come out to the house and talk over some of the good old days.” Here was a man, personal friend of presidents and men high in the affairs of church, business and state, who was able to retain interest in his fellowman in all walks of life.

So taps has sounded for the last of the great Washington foursome who, only two decades ago, campaigned on a national scale for better turf with the aid of science. In the order of their passing: Dr. Charles V. Piper, Dr. Russell A. Oakley, Dr. Karl F. Kellerman and Dr. Walter S. Harban.

EASY GOLF HIKES PLAY

C. M. DOLAN, owner of Indian Head, a daily-fee course in the Chicago district, presents the dope on when and why golf should be made easier and in GOLFDOM'S opinion, reasons logically. Dolan's way of thinking doesn't infer that competition should vanish from golf, nor its interesting problems disappear. He believes that people want golf for fun instead of for frustration.

Club officials and pros who read Dolan's piece will be reminded that the minimum of loss during the depression came from that class of players who shot 85 or under.

Says Dolan:

For some years I have been trying to analyze what is the trouble with golf and I am always forced to one main conclusion, namely, that the game is too difficult. I have a growing conviction that if it were possible to increase the skill of the average golfer to the point where he could shoot in the eighties, we could pack our courses, private and public, with happy, spending golfers.

Was Toughening Courses a Dumb Move?

Unfortunately, for the past 20 years when golf was undergoing its great expansion in this country, we have constantly striven to make it more difficult through lengthening the courses, increasing the hazards, and legislating out many clubs that might have made it easier to hit the ball.

While the fever of something new was in the air, recruits aplenty were found to keep the balloon constantly expanding, but we finally reached the stage where the older men began to weaken under the struggle to hit even a few decent shots in a round of golf, and as for shooting in the eighties, it was simply out of the question. For some years the struggle has been to keep under one hundred. The hopelessness of it all was driven home in such a cruel way, by double figures on some holes and, with rounds of 100 to 120, the average golfer began to weaken and say in ever increasing numbers, "What's the use?"

In most cases pride kept us at the game as we did not like to admit we were unable to master golf after spending endless hours in practice and play.

The depression gave us an excuse and

an incentive to give up the unequal contest and save our face under the pretext of financial reasons; tens of thousands quit. I do not think the price had much to do with it so far as the daily-fee player was concerned, but it did enter decidedly in the resignations from private clubs. Even here, had the rank and file of the club members been playing golf in the eighties or high seventies, I will wager they would have found ways and means to carry on for the thrill that comes to one who is able to play well.

Easier Layouts Please Dubs

I know of no way by which we can make it possible for the dub to acquire skill but we can at least help him a little by putting a maximum limit on the length of our courses, remove some of the excessive tight trapping around the greens, etc., all of which may lower his average score by five to seven strokes and eliminate the double figures that now appear on his card.

This will improve his mental attitude as he reaches the end of the round and he won't be tired by the excessive yardage and by the tramping back and forth as he endeavors to get the ball to stop on the "carpet." We apparently have lost sight of the fact that golf, public and private, is sustained by men over 35 years of age. When we wear these men down and out through constant stiffening the game to the point where it exhausts them both mentally and physically we have cut off our main source of income.

Now why have we adopted such a short sighted policy during the past 20 years? Simply a matter of pride, as we did not want an expert to be able to visit our club and break par. What a silly reason for ruining the game for the people who make golf possible. Why worry if an expert shoots 65 or even 60 on your course? What

percent of your members gives a "continental" what the experts shoot? What the members are interested in is their own scores.

If we will retrace the ground we may save a percentage of our present golfers between 35 and 65 to the game, but this is not the permanent answer. We must turn to the youngsters and by getting them interested in the game while they are still children, which is the only age at which one can start and attain a reasonable proficiency in the game that will stick through life, we may build up a generation of golf-conscious and golf-playing people who will be able to enjoy the game and as finances permit become the loyal supporters of golf.

I think that every daily fee club should sell golf for about 25c a day to all those

under 18 years of age from Monday to Friday and 50c on Saturday and Sunday. High school kids can afford to pay 25c but it is doubtful if they can or will invest 50c to play three or four hours after school or even all day during vacation. The result is that they do not play and possible future supporters for the game are lost. A 50c rate for Saturday and Sunday would permit the young boy who has to work most of the week to get in a day of golf at a fee he can stand out of his weekly wages where a \$1.00 or \$1.50 charge would probably bar him. He would never acquire skill in his youth so would be lost to the game later in life when he might take it up for a few brief years and then quit in disgust, like thousands of others do annually on account of their inability to "give the old ball a ride" in a fair percentage of the attempts made.

HOLLOW FORK TECHNIQUE

By A. LOWELL
EASTMAN

*This club has brought about great improvement
in its greens through sustained forking program*

THE successful maintenance of golf greens demands that the turf plant retain undisputed possession of a soil which is constantly in a fine state of tilth. Very little difficulty is experienced in cultivating the average garden crop, but to cultivate sod land without completely destroying the crop itself is quite another problem.

Bearing this fact in mind, it would seem essential that golf greens be established on soils possessing unquestionable qualities for remaining in friable condition. Yet many greens are constructed with apparent neglect of this fact. To save on hauling costs, materials which may be had in the immediate vicinity are used regardless of their ability to remain in good tilth. This practice has resulted in the complete rebuilding of greens so constructed, or in less severe cases, the necessity of cultivating benefits.

Most loam soils are capable of satisfactory crop production providing cultivation has a place in their management. This fact has been clearly demonstrated in many instances where golf courses have been constructed on farm land whose soils produced abundantly only to fail miserably when planted to grass simply because cultivation ceased on the establishment of turfed areas—convincing evidence that

cultivation is a major factor in the successful management of any soil.

Most greenkeepers realize this need for cultivation when normal maintenance practices fail to give desired results and resort to the use of spiked rollers, or, in extreme cases, strip off the turf and spade up the underlying soil, incorporating soil-building materials, a most effective but always expensive method.

The need for a turf cultivator which could be applied without destroying the surface has been met in the development of the hollow-tined perforating fork, a hand tool which will actually fork or cultivate to depths up to 4½ in. without disturbing the surface and with little interference to play. These tines permit the removal of cores of soil, leaving deep, well-defined holes for the reception of topdressing materials.

In September, 1933, the Suffield (Conn.) CC undertook a cultivating program using the hollow-tined forks, which pro-

TABLE NO. 1. General Improvement in Cultural Condition of Greens After a Five Year Forking-Topdressing Program.

Item	Improvement Since 1933
Desirable Grasses, Amount....	9 %
Desirable Grasses, Health.....	30
Desirable Grasses, Texture....	31
Weed Varieties	21 Fewer
Weed Quantity	21 Fewer
Surfaces	68
Physical Condition of Soil....	31
Scars	8 Fewer
Total Average Improvement	24%

gram has been continued through 1937. During the five year period, it has been our privilege to note many cultural improvements in our greens, the text of which is given in Tables 1 and 2.

The improvements noted are not entirely due to the forking in some cases, but, this cultivating program has been the backbone of our entire maintenance schedule, contributing more than a little to all phases of the substantial gains.

Establish Root Feeding Zone

Of primary importance in bringing about these numerous changes is the improved physical condition of the soil. Use of a suitable topdressing medium after forking has largely influenced improvement of soil conditions. In order to realize any appreciable gain in this respect, it is essential that the topdressing materials used be of such nature as to correct the faulty structure of the existing soil. The cores formed by the hollow tines encourage a general deepening of the root system (especially noticeable in heavy soils), but development of the all important feeding roots requires that the cores be well supplied with a suitable rooting medium. Unless a satisfactory feeding zone is established, the new roots are apt to become "cordy" and of little value as plant sustainers.

The process of removing old soil and adding new not only provides beneficial soil organisms, but tends to equalize their distribution and increase their activity. I have observed a timely forking correct a sluggish, unsatisfactory response from a normal fertilizer application, unquestionably due to stimulation of the soil flora. The essential requirements for

normal bacterial activity are, namely, a warm sweet soil, ample moisture, free air circulation and a balanced ration, all factors which are beneficially influenced by soil cultivation.

Before putting a forking program into actual operation, careful consideration should be given to several factors, among the more important being: when to fork, frequency of forking, preparation of greens to be treated. Due consideration of these details will permit a more efficient and economical operation of the program.

How to use forks: Briefly, the forks consist of six hollow tines, $\frac{3}{8}$ in. in diameter, and available in lengths ranging from 2 in. to 4 $\frac{1}{2}$ in., tapered on the inside to eliminate plugging. They are spaced approximately 2 in. apart. To insure a clean job, the forks may be equipped with a plug catcher which is quickly and easily emptied into a pail as workmen progress.

In using the forks, the operators work backwards inserting the forks every 2", 3", 4" or at whatever frequency is desired. Our practice at Suffield has been to space the insertions approximately 3" apart.

At least two men should work a green in order that an appreciable showing will be made, and the green topdressed before drying out occurs. This is important as the many vents encourage rapid loss of soil moisture by evaporation. Holes should not be left open more than a day unless careful attention is given to watering and this tends to close the holes, making it difficult to work topdressing into them. It is best to fork half a green and topdress immediately.

Use Water to Soften Soil

To facilitate the forking, we have found it advisable to thoroughly hand water the turf from 12 to 24 hours before beginning operations. Careful watering by experienced men helps to put the soil in good working order, greatly speeding up the operation and increasing the ease with which the forks may be inserted.

The tines will plug up occasionally and a 6 in. spike with the point filed off is very useful for cleaning them out.

Worn tines have a tendency to plug frequently, greatly increasing the cost of operating and they should be replaced with new ones. Generally, tines will work

TABLE No. 2. Forking Time In Labor Hours, and General Gain Each Green Has Shown Since 1933.

Green No.	Area Sq. Ft.	Soil Type	Average Forking Time	Evaluation		Per Cent Improvement
				1933	4-Year Av.	
1	4300	Clay Loam	35 Hours	68.5	80.9	12.4
2	3870	" "	31 "	62.5	79.5	17.0
3	3700	" "	38 "	72.0	80.9	8.9
4	4120	Silt Loam	30 "	81.5	85.3	3.8
5	3600	Clay Loam	22 "	67.5	77.8	10.3
6	3480	" "	22 "	68.0	77.9	9.9
7	3700	Silt Loam	27 "	74.0	83.5	8.5
8	5500	" "	46 "	75.5	82.0	6.5
9	4500	" "	30 "	74.5	81.3	6.8
		Average	31 "	71.5	81.0	9.5

NOTE: Evaluations based on 100 per cent for a perfect green. Inspections made annually by a noted turf authority.

efficiently for from 100 to 125 labor hours.

From Table 2, it may be calculated that our forking time has averaged 7 labor hours per 1,000 sq. ft. Two men will fork the average 5,000 sq. ft. green in two nine-hour days. This may appear to make the labor cost excessive, but reference to the results we have obtained as given in Tables 1 and 2 show that the investment is decidedly worth while compared to other less effective methods of perforating only the soil surface. For an annual investment of 40 labor hours per green, this cultivating program has aided materially in acquiring for us, without interference to play, the following essential requirements for establishing fine turf:

1. Improved physical condition of soil.
2. Encouraged deep root system.
3. Corrected sod-bound turf.
4. Increased water efficiency.
5. Increased soil aeration.
6. Increased available plant nutrients.
7. Improved drainage.
8. Increased activity of soil bacteria.
9. Reduced weed, disease and insect invasion.

After Tining, Work Dressing In

Topdressing: As previously stated, the topdressing material used should be of such a nature as to correct the undesirable structure of the existing soil.

Greens may be topdressed in the usual manner, being especially careful to work as much material into the holes as possible. Wooden lawn rakes reversed made excellent tools for this purpose.

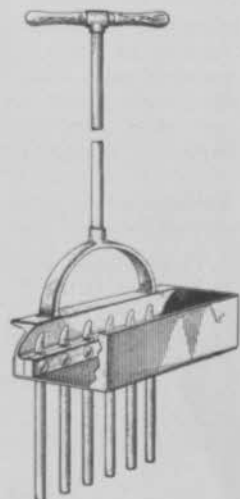
It is well to apply the material somewhat heavier than is customary for the

average topdressing to compensate for the extra material required to fill the holes. Spread $\frac{3}{8}$ " to $\frac{1}{2}$ " thick should be sufficient.

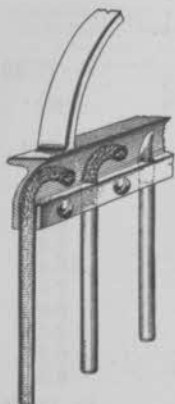
In order to spread well, the material must be comparatively dry. This, of course, necessitates a thorough watering immediately after completing the topdressing operation as the dry material absorbs the soil moisture. Frequent watering is essential until the roots become established in the new medium. If forking is done previous to the root regenerating period and general maintenance requirements are strictly adhered to, by mid-summer new roots will be abundant in the many perforations of the hollow-tines.

When To Fork

Above all else, the deciding factor should be the necessity for this type of



The hollow tines, tapered on the inside to prevent plugging, are available in lengths from 2 in. to 4 $\frac{1}{2}$ in. and are spaced 2 in. apart.



This cut-away view of a hollow-tined fork shows how plugs of soil are worked up through each tine. Plugs are caught in a hopper (see previous cut).

the supply of plant foods which have been stored in the roots for the winter, no particular ill effects will be noticed. I personally prefer this period to any other because of convenience in laying out the working schedule, much of the routine work being discontinued and also because the alternate freezing and thawing which takes place over winter tends to settle the topdressing material around the root system, preparing the turf for an early start in the spring.

Summer Forking Best Avoided

Emergency forking may be carried out during the summer months, but it is not advisable as a general practice, as it interferes with normal summer dormancy. Not only the forking but also the heavy topdressing and watering which must necessarily follow have a forcing effect on the turf—generally considered undesirable at this time.

The number of times a green will require forking is largely a local problem. Where the soil structure is definitely the limiting factor to normal plant growth, several treatments may be necessary to bring about the desired structural condition. When we first undertook this program at Suffield, frequent treatments were given to the more backward greens (three forkings a season) as the soil had become so thoroughly puddled that one treatment proved inadequate.

Since 1934, however, one, or at the most, two forkings a year have proved ample and in some instances the treatment has been omitted altogether for 12 to 18 months. This, of course, is as it should be, indicating that the program is proving effective. Each season should bring about a reduction in the number of treatments required unless unusual conditions cause temporary setbacks.

Where a program of this nature is introduced for the express purpose of correcting faulty soil structure, I am of the opinion that it should become a more or less permanent part of the maintenance program, bearing in mind that the longer the program is in force, the more economical its operation becomes because of increased ease in working the forks and a more lasting effect from each successive treatment.

treatment. If a green needs attention, it should be treated immediately regardless of the time of year (providing the soil can be worked).

There are certain advantages to be gained, however, by forking either in the early spring or late fall. Bearing in mind that the major benefits of forking greens are associated with the root system, it seems advisable to carry out a program of this nature at a time when normal root growth will be stimulated. The root system of grasses being for the most part annual in nature, maximum growth must occur at a definite period in the growing season. Data on this phase of turf maintenance is comparatively meager but it is generally believed that new roots are developed early in the growing season, very little if any regeneration taking place after May or early June.

It should be understood that use of the hollow tines results in a temporary destruction of the root system, a certain amount of roots being removed with the cores of soil. The extent of root destruction is not great, but it might prove detrimental if over-forking occurs after the period of normal root regeneration.

Advises Spring or Fall Spiking

Theoretically, then, early spring or late fall seems to be the ideal time to undertake a program of this nature. Early spring forking tends to stimulate normal regeneration and in cases where soils become thoroughly puddled during the playing season, it is advisable to take advantage of the loosening effect of the winter heaving.

While forking in the fall may reduce