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He also had to think well ahead so he could arrange for a supply of the sand wedges.

Of course, the other fellows might say that it is seldom a novel new club comes



Here is Sayers' timely newspaper ad.

in that gets the free publicity and star use that the sand wedge got and for that reason the chances of one pro shop selling 300 of one kind of club during a week happen only once in a blue moon.

But that isn't the main point. The tipoff is that George knew there were going to be a lot of people at his club, and that these people represented a tremendous increase over his normal market. He used his noodle and got them to "lay it on the line." Every time there is a tournament held at a club the pro has the same sort of a chance. There are a lot of gallerites who get fed up on trotting around the course trying to push through the crowd and get a peek at a shot now and then. These folks gather around in the vicinity of the pro shop to get breath back and then they give the pro a great chance to invite them in to look over his stock. Especially in the case of golfers who are not attached to any private club is the pro at the tournament club given a great opportunity for selling. The unattached players like to boast that they bought certain of their clubs from pros at ritzy private clubs.

Next year we believe the pros will make more of a play on cashing in with these tournament galleries, for George Sayers has given them a striking demonstration of how this gallery business can be made to produce for the smart operator.

To this substantial citizen Mr. Sayers, GOLFDOM extends hearty congratulations for his work in showing what a live pro can do in picking up a big profit when many would walk right past the spot without thinking. One of the many bright spots in the pro picture is that more pros are doing this sort of work each year.

For the Miniature Golf Course A Permanent Fairway Surface



-That is always dry -That won't track off

THE ideal fairway surface for the miniature golf course is one that is smooth and solid, that won't track off, that dries instantly after a shower and is cleaned and freshened by sprinkling.

All these characteristics are found in Cardiff Green Marble GRANITO plus the added advantage that its natural green color makes it particularly attractive. Cardiff Green GRANITO size 00 is specially prepared for the miniature golf course. It packs smooth and solid; it makes a permanent green surface that withstands punishment and keeps maintenance low; its color is permanent, spraying with water instantly cleans off mud or dirt and it dries instantly.

For lower costs and greater utility of the course use Cardiff Green GRAN-ITO size 00 for surfacing the fairways and greens.

Quarry Office Cardiff Maryland	GRANITO	Sales Office 350 Madison Ave. New York
	Green Marble	



The fourth green at Inverness. Distance is 431 yards and the green is located on a nicely contoured knoll, a natural situation of high order

Greenkeeper First Factor in Course Making; He'll Get the Grass

By WM. J. ROCKEFELLER

A Continuance of the Reflections of Inverness' Veteran Greenkeeper

OWADAYS we have so much glib talk about "bent greens" that in most cases it is ludicrous. A visitor, an official from some old or new club where a lot of money has been spent, will breeze in. About the first pop-eyed remark he will make will be, "Our greens are bent." That settles the whole question. Nothing more is to be said-the final word has been "spake." Now, in the first place, we know, or should know, what he means, or thinks he means, after 30 years of summering and wintering with every kind of grass under the sun. It is a thousand to one bet that the said "sees all and knows all" chap don't know that, of bent grasses alone, there are over one hundred distinct varieties!

Now bent, at its best, bred to its finest character, like human beings, is ideal for putting greens. However, it is true that one should not have a one-track mind about grass or anything else. (Hay fever victims excepted.) Common sense should always be in command up in the old dome. However much the financial condition of the club may be "bent," and members be weeping and gnashing their teeth over another assessment caused by tearing out 18 fine putting surfaces of real, honest-togoodness durable grass that stood up and didn't have a nap, that sort of thing will go on.

At Skokie in 1922 I saw eighteen of the finest putting surfaces in the world, and what were they? Just poa-annua—humble, often despised, little, modest, hard-working, but so useful "poa"—and those were not the only ones!

How about those wonderful greens at Youngstown?

The answer? First-class greenkeepers! At Inverness the greens are of the bent grass family, that we call "Inverness Ten," because the tenth green is practically the mother of them all. She had been breeding greens at Inverness for nearly 30 years and they have all the fineness and durability that dear old friend of the very numerous "Bent Family," Velvet. How

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The reproduction of holes of famous full sized courses in interesting detail so the attraction of the miniature course is as perennial as that of its full sized inspiration.

The indoor and outdoor use of the Bierly-Jansen Miniature Golf Course is the installation that attracts and holds the steady patronage of the veriest dub and skilled player alike.

Patent protection and restriction of territory give you guarantee of high earning power. Any competent judge of golf or the amusement business will see at first sight unequalled earning probabilities in these Miniature Golf Courses.

Playable under all conditions, putting surface that is practically identical with that of grass and no maintenance trouble or expense, are three major money-making features of this course.

The course that has been in operation in Wing H on the 7th Floor of the General Motors Building, Detroit, Michigan, has proven beyond a doubt that in the high rent districts, indoor Golf Courses are establishing earning records that are standing firm. These installations are proving that miniature golf on the *right basis* of design and construction is a lasting and profitable business.

Professionals, greenkeepers and others who know the golf and amusement business give these Courses the highest endorsement.

One of the exclusive patent pending features is the great business developer, the Electrically Operated 19th Hole.

Shorter Bierly-Jansen miniature model golf courses can be built in private residences as the finishing touch to finest homes. Pros who are real business men will interest members in backing them financially in Bierly-Jansen miniature courses.

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hat's but one of the beauties of the Thompson Quick-Coupling Valve. When the groundsman attaches the Master Sprinkler he TURNS on the water. Water hammer is avoided. Pipes and equipment last longer. The groundsman does not get wet.

The savings in work, hose, water soon make a Thompson Quick-Coupling Valve installation pay for itself. And the additional paying players that the more beautiful greens and fairways bring in, add no small revenue to the club.

Investigate Thompson underground sprinkling today. Get full details from your golf equipment dealer. Or write direct for FREE booklet.



ever, let us get away from a "grass specialty," for Inverness is not "out" to sell grass stolons, but to have ideal putting surfaces for the 1931 Open Championship.

Greenkeeper the Big Factor

Getting right down to the things that really count, the first question I always ask is not what kind of grass you have. It is what kind of a greenkeeper have you? If the answer is satisfactory, it means that his upkeep is good in all of the course details-greens, tees, fairways, bunkers, rough-in fact, everywhere the really good conditions should, in justice, exist. That means infinite patience and industry on details. Golf upon a first-class course is a game that calls for shots to match its class but not any form of crucifixion. No bunker should be so constructed and maintained that a genuinely fine recovery shot cannot be played from it. Its fundamental penalty should always be one and no more for the properly played shot. A capable and always sensible greenkeeper will insist upon his men being very diligent about such considerations of play.

Keep the Equipment Right

Now here is something that ought to be emphasized: No workman in any job can do good work with poor tools or those out of condition. A season's upkeep of a golf course takes a lot out of the best machines. This brief piece of advice is especially for small clubs which are springing up all over the country.

Don't lay your greenkeeper off at the close of the golf season. Keep him all winter. It pays, for there is plenty for him to do. Practically all of his machines should be completely "taken down" and overhauled, cleaned, sharpened, and put into first-class cutting shape for the coming season.

A live, ambitious and industrious greenkeeper will be busy all winter and more than earn his wages. Common sense should make this clear at once to all small clubs. The clubs that have grown big do not need this advice. They have long since learned the practical value of starting a season with all machinery and equipment of every kind in first-class shape.

It means big economy besides the best playing conditions.

Chicago, Ill.—Golf Construction & Supply Corp., 520 North Michigan avenue, recently has been established to deal in all supplies for miniature courses. J. A. Carter is president.

Tree Program Should Rate High on Every Maintenance Schedule

By MARTIN L. DAVEY

I N THE rush and turmoil of getting greens, tees, and fairways in good condition for the playing season—and keeping them that way after the season gets going—the trees growing on a golf course are often slighted by the greenkeeper and considered only casually by the club officials.

It is easy to understand why this is so often the case. A half-dead, neglected tree on a course rarely gets more than a sympathetic glance from a few of the golfers, whereas a neglected green, with dying turf, is certain to evoke a volcano of complaints. A tree may be eaten by decay and attacked by a horde of insects and the green-chairman seldom hears a protest, but let a trace of brown-patch or crab grass make its appearance and he is instantly deluged with lamentations.

Reducing complaints of any kind to the minimum is the aim of everyone connected with the management and operation of golf clubs. And since the players are far more likely to complain about the condition of the course than they are about the trees, it is only natural that the course gets the lion's share of attention.

If a club cares only about its popularity today and tomorrow, such a policy may be quite satisfactory to everyone concerned. Many clubs have learned, however, that while such a course may be expedient, it is short-sighted—it doesn't give the future a fair shake.

That trees are well-nigh indispensable on a golf course goes without saying. Planted between parallel fairways, they provide a screen which protects players from being struck by badly hit balls on the fairway adjoining. They provide shade for the players on blistering summer days. They serve as splendid natural hazards. They protect the soil from driving rains; mighty few bad washouts occur on courses where trees border the fairways.

Trees are desired on golf courses just as much for esthetic reasons as they are for practical reasons. Man is essentially an outdoor creature and the beauty of the out-of-doors beckons to him always. He may not be conscious of any inner urge to go out and "commune with nature" but it is there nevertheless. So he instinctively likes best to go to the courses which are naturally beautiful and nine times out of ten that means courses which are blessed with trees.

All this is obvious. It is likewise obvious that the trees will be needed by the club just as badly in future years as they are at present and that if they are being neglected, the club is dissipating an asset which is practically irreplaceable.

Annual Tree Appropriation

Realizing this, the officials of many clubs consider their trees conscientiously. They want their clubs to be as beautiful 10, 20, or 50 years from now as they are at present, and they know that this will not be possible if they do not give the trees the attention they deserve. An annual appropriation for tree care, therefore, is being included in the budgets of a steadily increasing number of clubs.

With a definite amount of money available, it is comparatively easy for the greenkeeper to estimate accurately how much work can be done and to determine what work should be done first. He is often aided in doing this by experienced tree experts who make a survey of all the trees on the course and map out a program of work to be done over a period of years.

This year particular attention should be paid to the feeding of trees, due to the fact that their vitality was greatly lowered as a result of the unusual weather conditions which prevailed over almost the entire country during the past two

This is the first of a series of articles regarding the care of trees on golf courses which are being written for GOLFDOM by Martin L. Davey, noted conservationist, and president of the Davey Tree Expert Co.

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Tell us any idea for making GOLFDOM advertising more helpful.

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years. Greenkeepers who fought month after month last summer to keep their courses in even a halfway presentable condition do not have to be reminded how bad the weather was for all growing things trees as well as grass.

1929 Bad for Trees

In 1929, the combination of a cold, wet spring and a dry summer hurt the trees tremendously. They were able to store up only a fraction of the amount of food required. As a result, they started this year in a weakened condition. Then came the worst drought in the memory of any living man. Many sections had no rain whatever for several months. Countless thousands of trees were killed, and thousands more are now in the process of dying. All the ill effects of the drought were not immediately apparent—some will not show up until next year.

Many of the trees which are now hovering on the border line between life and death can be saved if cared for properly. The main thing they will need when the growing season starts next spring is an available supply of nourishing food. If they can get it, they will be able to build up their strength rapidly and overcome the handicaps they are now under. If they fail to get a good start, they probably will become steadily weaker and will die.

If the condition of the trees is critical. and if the soil around their roots is heavy and hard packed, it is advisable that they be fertilized by the cultivation method. The ground above the roots should be worked up and loosened and the fertilizer should be mixed with it, great care being exercised to avoid injury to the roots. The more thorough the mixing, the more efficient will be the feeding. It goes without saying that a good grade of tree food should be used and that it should be applied in the proper quantities. The cultivated area should then be heavily mulched, and should not be resodded for a period of two years.

In less serious cases, excellent results will be obtained by the perforation method of fertilization. This method does not necessitate removal of the sod from under the trees. Holes are dug with a crowbar over the entire root area, about one foot apart, and to the depth occupied by the roots. After the fertilizer is poured in the holes, they can be filled with earth and the sod cap replaced. Whenever possible, the fertilization should be entrusted to experts who know exactly how much food the trees require and how it can be best applied. Excessive amounts of quickly available fertilizers may easily kill trees.

If the fertilizer is applied this fall, it will become well distributed throughout the soil around the roots by spring and will be available as soon as the roots become active.

Spraying Is Demanded

Special care should be given to spraying this year for the same reason that the trees should be fertilized. Inasumch as the trees have been seriously weakened, they will be much more susceptible to disease and insects than normally, and if they are attacked by any pest which makes them any weaker than they are at present, they undoubtedly will die. Consequently, it is obvious that more than ordinary attention should be paid to disease and insect prevention.

The many kinds of scale which are particularly dangerous to trees in a weakened condition should be attacked as soon as possible. The substances which must be used to kill them are injurious to leaves and consequently the spraying must be done during the dormant season.

Many of the diseases which afflict trees and also many of the trees' insect enemies can only be attacked or warded off after the leaves come out. It will be advisable, therefore, to have the trees inspected next year at regular intervals to determine if spmaying will be required. One or two sprayings may prove to be the deciding factor in the trees' struggle to overcome the effects of the drought.

Spraying, incidentally, is a phase of tree work which should be done by experts. It is easy enough to mix a couple pounds of chemicals with water and spray the mixture on the trees but unless the spraying is done by someone who knows exactly what insects or diseases are harming the trees, he cannot know what chemicals to use, what quantities, how they should be applied, or at what seasons. Done improperly, spraying may injure the trees and perhaps kill them; done by experts, it is the most effective means known for combating pests.

A noted golfer once said that the three greatest assets of any golf club are the course, the clubhouse and the trees. Uncourse, the clubhouse and the trees. His statement is obviously true, and let noone under-estimate the importance of trees.

Working for the Club!

One of the activities carried on by the Club Managers' Association of America is a clearing house through which managers may obtain information as to the financial operation of other clubs comparable to their own.

The Association recently made a survey of clubs throughout the country, in which information concerning the size of the club, membership, cost of maintaining various departments, salaries paid to individual employees, restaurant volume, information as to various items of overhead, charge against restaurant and a multitude of other financial angles of club operation were obtained and placed at the disposal of those seeking information.

Along with this, a standard form of restaurant report was compiled by John Rogers of the Union League Club, New York City, and Frank Wheatland of the Colony Club, New York City, making it possible for managers to obtain an adequate comparison between clubs similar in size with their own operations.

At the present time, a similar report is being drawn up for the use of country club managers and which should prove invaluable in assisting them in finding out the whys and wherefores of the showings of other clubs to satisfy themselves as to whether some particular condition is making it possible for another club similar to their own to show better results and to apply remedies which will better their own condition.

All big business has found the value of making comparisons with competitors and with others engaged in identical lines of business. The gathering of statistics, the examination of reports is a splendid means of maintaining progress.

It is none the less true in club operation that comparison of methods both financial and otherwise has a value which can hardly be estimated.

Which can hardly be estimated. We believe that this phase of the Association work can be of the utmost value to clubs and their managers, and that it is the forerunner of what will become necessary as time goes on, namely, a more nearly standard method of accounting than is in force at the present time. Every manager should be interested in knowing what the other fellow is doing, and this

Every manager should be interested in knowing what the other fellow is doing, and this information is available to him through the medium of the Club Managers' Association of America. Further information concerning the Association's efforts in this direction may be obtained by addressing the National Secretary.

CLUB MANAGERS' ASSOCIATION OF AMERICA Henry R. Dutton, Sec. Boston City Club Boston, Mass.



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Midlothian C. C. (Chicago district) has a water system that combines deep wells, a stream and this reservoir site. The pumphouse shown has automatic pressure control apparatus as a feature

Watering System for 9-Hole Course Must Look to the Future

By WENDELL P. MILLER

HE nature and extent of the ninehole watering system is determined by the amount of funds available. Usually the problem is not how efficient in results and how economical in operating costs, but how cheaply can water be carried to the tees and greens. Golf course sites are rarely selected with any consideration for the irrigation and water supply problems and both drainage and irrigation are budgeted after the surface work, the constructor, and the architect are taken care of. This situation is a concomitant of golf club organization and there is no preventative, during the early club stages, for inadequate drainage and irrigation construction. We can point out the errors that are commonly made and indicate the materials and construction that are proving satisfactory in the hope that the designers of the initial water systems will make the most of funds available through improved design and construction, and perhaps be better equipped to argue for larger appropriations for the water system, to the end that the engineer who in later years is called upon to improve and extend the water system is able

to utilize all of the original construction in the complete irrigation project.

It is indeed unfortunate that club officers, organizers, and course owners cannot foresee the ultimate consequences of this "penny wise pound foolish" policy in lavishing money on clubhouses, furnishings, and all sorts of accessories, while starving the water and drainage systems, the facilities which more than any others can contribute most to the final success of the club.

In the absence of the owners' or clubs' foresight and understanding of their irrigation and drainage requirements, the designer is forced to eke out the meagre appropriations by designs and construction they would not otherwise even consider, and by establishing water supplies which are inadequate at the outset.

We hope that our propaganda for better golf courses and better course facilities will eventually bring our golf course owners to an understanding of the fundamentals of irrigation and drainage requirements, and that the following outline of irrigation requirements and construction will be of particular assistance, not only



Concealed tee sprinklers in "mow-over" tees at University of Michigan's new golf course

to the nine-hole courses, but also to new courses of all sizes.

Water Supply for Nine Tees and Greens

A water system is nothing without water, hence first of importance is a dependable water supply of not less than 10,000 gallons per day, if the soil is tight, or 15,000 per day for medium soils, and 20,000 gallons for loose, sandy soil. If, in addition, the climate be arid, then another 5,000 to 10,000 gallons are necessary. Further, the entire daily water supply should be available for withdrawal within an eight-hour shift. The above figures do not include lawns, stables, swimming pools, and other accessories nor do they include fairways.

Pressure and Pumping

The working pressure should be above 50 pounds at the extremities of the system. This pressure usually cannot be obtained from an aerial tank unless the tank be located on a hill or rise. For rough figuring allow one foot of pressure to two and one-half feet of elevation. If city water is used, the pressure is apt to be low as golf courses are usually located at the extremities of the city water system. By sprinkling after 10 o'clock at night the peak load on city water systems can be avoided and maximum city pressures secured. If possible, a pressure pumping plant (booster) should be installed for either city water or aerial tower supply. Boosting the pressure to 80 or 100 pounds greatly simplifies the work of sprinkling. For a nine-hole tee and green system the pump can be installed with ordinary manual control. A centrifugal pump with a capacity of 150 to 200 gallons per minute will

operate nine green sprinklers very effectively. The cost of pump, motor, switch, fittings, and shelter box should not exceed \$1,200 installed (does not include bringing electric wires to pump). This same equipment will serve if the water is to be taken from reservoir, lake, or river. If a well is the source of supply, the well pump can be arranged to supply the tees and greens direct without booster pumping, but if an aerial tower or standpipe is used, without automatic control of the well pump, it will be necessary to pass the water through the aerial tank and use it at whatever pressure is thus provided-or with the addition of the booster pumping plant mentioned. Bear in mind that when booster pumping is employed the pressure under which the water enters the pump is not lost or duplicated -it is merely increased.

Wells, Towers, Clubhouse and Course

It is this combination which furnishes the complications. The simplest arrangement, as above mentioned, is to pass the water through the aerial tank, and use a booster pump to provide proper pressure for the golf course. Direct pressure pumping by well pumps to the golf course is not satisfactory, particularly with deep lifts; and if the well also supplies the clubhouse through a tower, or otherwise, the complications arise from the simple fact that adequate pressure for the golf course is ruinous in the clubhouse, the plumbing will not stand it. Of course, pressure reducing valves can be used to protect the clubhouse plumbing but there are objections to reducing valves, and so it goes. The combination of deep well,