suitability and wearing qualities, the acidity or alkalinity of each green, the acid tolerance of the grasses on the greens, if acid soil types; methods of overcoming acidity or alkalinity; specific information as to top-dressings, composition of top-dressing; composting, and materials available for these purposes.

The investigation also should deal with any pests or untoward growths on the grounds, explain their habits, and means of eradication. It must be the object of the survey to determine all the favorable and unfavorable conditions of plant life and growth on the property examined so that the owners can extend the favorable conditions and take every advantage of them, and at the same time eliminate, or initiate action tending to eliminate, all of the unfavorable conditions.

Basis for Program.

When the chairman and greenkeeper are provided with specific, correct, and dependable information on the soil and turf they are enabled to carry on their work in the light of exact knowledge, and according to technically and practically correct procedures, thus eliminating wasted efforts, time and money spent unnecessarily; besides, and most important of all, preventing mistakes and errors in the handling of turf.

Consistent year by year improvement in turf can only be attained by conscientiously following a definite program. A large number of clubs, notably the Columbus C. C. and Scioto in Columbus, Ohio; Westwood in St. Louis, Onwentsia, Glenview and Sunset Ridge in Chicago, have been making marked progress in turf development through the application of the facts developed by a complete soil survey. Turf development at its best is a slow process, but when nature is aided, year after year, by a program developed upon facts, you can get lasting results at an economical cost.

THE turf on the tee should be composed of a hard deep-rooted grass that will stand cutting of ordinary divots and recover. Therefore a foundation should be made which will encourage the roots to go down, whereas if a tee is only top dressed the roots quickly come to the surface and each divot made is disastrous.

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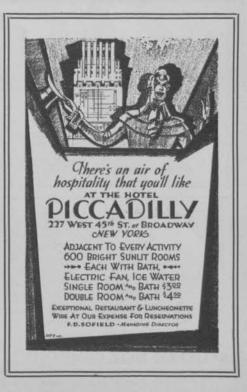
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Roses Are Scenic Gems of Course Landscaping

By J. HORACE McFARLAND Editor, "American Rose Annual"

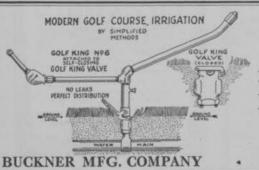
X/HY not use roses of the right kinds and add to the beauty of the golf course?

Mighty few men play golf with their eyes shut to the landscape. It isn't only the beauty of the fairways and greens, but the beauty of the landscape that attracts men in increasing numbers to this great old game. I have not read of enthusiasts who crave to play golf at night through unilluminated scenery. Beauty, therefore, is an inseparable adjunct to good golf, I insist, though many of the old birds who take to it are not seriously permeated themselves with outstanding physical attractions.

Now roses could add to the beauty of the golf course, used as borders and elsewhere to add, not only to the beauty of the surroundings but to the sportiness of I refer not to the petted the course. Hybrid Tea and other roses which must be milk-fed and coddled to do their beautiful best.

Roses that Fit Courses

Instead I call attention particularly to the lovely so-called "wild" roses, which are in themselves admirable shrubs and will take care of themselves. This includes the wonderful Rugosa roses, which are attractive when out of bloom, though their blooming season is long and the flowers are followed by richly brilliant fruit. It takes into account the Scotch rose which ought to be around a golf course, because it fits the game and will take a place where only three feet is the height limit.



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The Golf King No. 6 Sprinklers The Golf King Automatic Valves The Self Closing Snap Valves

Plan Your Hoseless System Now

BUCKNER EQUIPMENT IS STANDARD THE WORLD OVER

FRESNO, CALIF.

The Chinese beauties we now have, including the Hugonis rose, are in this category, and then there comes into it a magnificent group of hardy climbers which would make any golf course vastly more beautiful in rose time as they bloomed on its borders, while beautiful all the rest of the golfing year with attractive foliage, better than that on most shrubs, wild or tame, usually found.

Some of these climbers can be named as including Dr. W. Van Fleet, the one finest American hardy climber which will sprawl twenty feet in a season if left to go that way; American Pillar, just as vigorous and just as good; Silver Moon, which is a white beauty of the same rampant character, and about a dozen other vigorous and varied blooming roses that would take care of themselves. Alida Lovett, Bess Lovett, Christine Wright, Zephirine Drouhin, Dorothy Perkins, Paul's Scarlet Climber, Dr. Huey, Excelsa, Hiawatha, Evangeline, Paradise, Mary Wallace, Tausendschon, Gardenia, all are useful for this sort of unrestrained, self-sustaining planting about a golf course. Max Graf will cover a slope to advantage.

A world of fragrant loveliness is likewise available in the use of the Hybrid Sweetbrier roses, in which the lovely flowers are borne among good foliage that is continuously fragrant. Lady Penzance, Meg Merrilies and Flora McIvor are examples of this class.

Then the artful planter about golf courses would find that he could get continuous flowers out of the three Radiances, Gruss an Teplitz, and Birdie Blye, still keeping his bushes low enough not to be in the road.

Golf architects are beginning to realize what they have missed in not making greater use of the rose as a part of the game's setting. Those who have appreciated the rose's values are getting busy and showing lovely model plantings that increase the interest and pleasure of the game.

GREAT LAKES MOVES INTO LARGER PLANT

Milwaukee, Wis.—Great Lakes Golf Corp. has taken over a portion of the Shaler Co. factory at Waupun, Wis., 72 miles north of Milwaukee, as its golf club manufacturing plant. Need of more manufacturing space and attractive facilities at Waupun dictated the move. Great Lakes office and shipping department will remain at Milwaukee.



will ruin greens next year

If not treated now with a single application of

Corrosive Sublimate or Calo-Clor

Experiences during the past two winters have shown that northern clubs in particular suffer great losses thru failure to give their greens a preventive treatment.

Dr. Monteith, thru experiments in collaboration with several clubs, proved that a single treatment in the late fall entirely eliminated the expensive ravages of snowmold.

Write for Free Booklet

giving full directions for application together with results obtained by many clubs during the past several winters.

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Stolons from our nurseries are expertly developed, free of objectionable foreign growth and carefully kept true to type.

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THE LARK SPRINKLER

Hundreds of golf clubs throughout the United States have found THE LARK SPRINKLER exactly suited to their sprinkling needs. Few greens are so large that one setting will not sprinkle the entire green as evenly and gently as an April shower. For perfect greens this coming year use THE LARK.

Detailed Information on Request



Tree Life-Saving with Compressed Air

By CHARLES F. IRISH* Arborist for the Village of Bratenhal, Ohio

THE use of compressed air has been found very beneficial in improving the vigor of trees on areas over which fills have been made. The reason for the beneficial effect of the aeration of tree roots is readily understood when we consider the very unnatural condition under which most of the ornamental trees in our cities are existing.

Nature in the forest covers the forest floor with a loose, spongy litter of decaying leaves. Such a condition is ideal for the development of root growth. It conserves the moisture, supplies food, protects the roots from frost injury and draught, and prevents the soil from baking or packing. It permits the entrance of oxygen into the soil and the diffusion of toxic gases into the air.

The truck growers and florists by cultivation and fertilization establish a condition similar in effect to that which exists in the forest. It is not always practicable to maintain the mulch of leaves as in the woods. The soil about many trees is tramped down until it is almost as solid as the adjoining pavement. This results in a loss of moisture by causing the rains to run off instead of penetrating. It prevents the free entrance of oxygen, and all plant life needs some oxygen; most of our ornamental tree roots require a considerable amount, the willow being a notable exception.

The lack of oxygen also limits aerobic bacterial action, resulting in the incomplete breaking-down of organic matter in the soil and in the formation of toxic compounds. The living roots and soil organisms throw off carbon dioxide as a result of their respiratory processes. In small amounts this is beneficial to the functioning of the roots, but an undiffused surplus inhibits and finally stops root action, eventually killing the roots.

Method of Use

These conditions make many ornamental trees more susceptible to injury from insects and disease than they would otherwise be. The process of using compressed air as a remedy is very simple. It consists of boring holes to the desired depth, plac-

^{*}From American City.

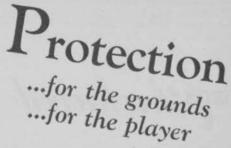
ing the air-gun in the hole and releasing the air. The depth to which the hole is bored and at which the air is liberated will depend somewhat on the particular conditions existing about the tree, the type of soil and the age and variety of the tree. Trees in some soils root deeper than in others. Then, too, there may have been changes in grade which should be considered. In the majority of cases a hole 18 inches deep will be found satisfactory. When the air is applied through the gun placed in this hole, the soil is fractured and as the soil gases are driven off a fresh supply of oxygen is driven in. We have observed under favorable conditions a penetration of over 6 feet in depth and 10 feet laterally. Fertilizer is then blown through the fractured soil.

A porous condition is established without any tearing-up of the surface soil. Sod will not be injured except for a few holes. The soil will more readily absorb water, which will, in turn, carry the fertilizer in solution to the trees. By using an oxidizing fertilizer, the beneficial soil organisms and processes are stimulated, with a corresponding stimulation in the growth of the tree, resulting in greater vigor, greater density of foliage, longer twig growth, and increased trunk size.

Trees well on the way to dying have been saved by this method. It has also been used to prove to gas companies that their mains are leaking enough to damage, or even kill, trees. The process is a simple one. The pneumatic gun is inserted into a hole drilled over the main and approximately to its depth, and the soil atmosphere and gas driven out through a second hole, frequently with such a rush that flame leaps three feet high, even though the usual tests have just failed to show any gas in the soil.

In brief, it is practicable by the use of compressed air to establish a soil condition about the roots of our trees similar in effect to that of nature or that established by cultivation.

Dayton, O.—A two day joint conference of the sales and factory staffs of the Crawford, McGregor and Canby Co. was launched here by the factory men giving the sales boys a good trimming in a tournament held at the interesting Macgregor course. The shop boys thus gave their running mates plenty of foundation for the sales talk that Macgregor clubs are made by fellows who use them, and know how.



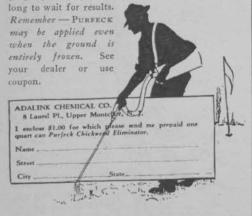


PAGE FENCE

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Building Tees That Improve Courses

By GUY C. WEST Supt., Fall River (Mass.) G. C.

N MANY courses green committees and greenkeepers are trying hard, and often with success, to get and maintain good greens, and yet are neglecting their tees. The courses with good tees, adequate for their play, and always in good condition, are few and far between! The tees are the starting points for the holes, and impressions gathered on them often are carried all the way to the greens. A player starting on a good tee is impressed with its size, its good condition, its levelness, its comfort, in direct contrast to the player who starts from the poor tee, possibly dubbing his shot while noting its smallness, its poor condition, its bare spots, its unevenness, and its lack of comfort.

In building tees, most golf architects and contractors make the mistake of making the tees too small. There are few courses where all the tees are large enough for the play on them. The evident solution for these courses with inadequate tees is for them to enlarge the present tees or build new ones. Whichever is to be done must be determined by the topography and by the playing conditions on that particular hole. In other words, each hole has a particular problem in regard to the location, shape, size, and number of tees. Many times two or more tees can be used to advantage, especially on short holes; in many other cases one large tee is better under the existing conditions. If the prevailing wind is with or against the line of play on a particular hole, and there is a desired length for the hole, a long narrow tee is often the best, if topography permits, so that the markers can be set to make the hole play the desired length under any wind conditions.

If then, the tees are too small, it is necessary to study the prevailing conditions, and enlarge or build anew, as the conditions demand.

It is a desire on many courses to get extreme length, and good holes are often ruined by lengthening them too much, with so-called "championship tees." If a course is to be used a great deal by very good players for championships of various kinds, it is often desirable to have "championship tees" on some holes; but for the average course with average players, it is nearly always best to build the tees for the majority, and possibly have long narrow tees, the back ends of which can be used for championship events. In this case, however, the markers should never be placed so far back that the players appear to be addressing the ball with one leg down over the back of the tee, as I have sometimes seen done!

Plenty of Room

The size of tees is governed by the amount of play, and by the type of hole; naturally the short holes where irons are used, will in general require larger tees. I believe that the first tee should be of generous size, and the tenth, if near the clubhouse, because these get hard usage, and give a good impression if large and in good condition. Such tees should be of three thousand square feet at least on most courses.

In building tees, the areas should not be raised except enough to bring to a level, allowing a slight pitch for drainage. On soils with a sandy foundation, tees can be built level with no resultant damage from water, but with clay subsoil there should be a slight pitch. The surface should be smooth, with no hollows or rises. In some cases tees must of necessity be raised to gain visibility, but it never should be done except where absolutely necessary. Tees built like "warts" on the landscape are eyesores, and usually unnecessary.

Many of the so-called "experts" have advised building tees the level of the fairway so that they may be cut with the fairway units, and thus much time and money saved! This idea must have come originally from a cost expert who never saw a golf course, for on how many golf courses could it be done. Tees are usually separated from the fairways by stretches of rough, and the fairway mowers do not go within a hundred yards of many tees. In addition, who has a fairway mower which will cut tees the way players are now demanding? The average height of cut on the fairways is much higher than the average on the tees. Shall we stop and adjust our fairway mowers to cut lower for the tees? On such courses as do cut from tee to green, the constant turning at the tee end would soon ruin the tee, and the spuds in the tractor wheels would make it look poorly. On some summer course with little money and a low standard of maintenance, maybe-on the good course, no!



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But now, a wonderful production season in our nursery and a record volume of business enable us to offer RIVERSIDE and LEESLEY stolons to you at a price that wins your business without exposing you to the uncertainties of buying questionable bent at false "bargain" prices.

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> Long Branch, Ontario, Canada. June 8th, 1929.

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Wheaton, Illinois, U. S. A. Gentlemen:

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> Yours truly, W. J. Sansom, Greenkeeper Toronto Golf Club.

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LAKE GENEVA CREEPING BENT NURSERIES

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Keep Tee Sod in Nursery

Keep the tees low wherever possible, but not with the idea of cutting them with your fairway outfit! A low tee doesn't dry out as fast as a high one. On a low tee there is less cutting necessary around the edges with scythes. Most important, keep low for beauty!

Tees can be played much more quickly if sodded. An area of tee sod should always be kept in the nursery. Often times it is very advantageous to rough out new tees in the late fall, let them settle thruout the winter, and grade and sod in the spring. Such tees can usually be played two weeks after sodding.

The grasses to be used for tees depend on the locality, soil conditions, etc. I have used with success seaside bent and Chewings fescue, the bent planted vegetatively, and the fescue seeded in at time of planting. The fescue makes a bent tee "harder" and more durable, and the bent in the sod knits the divots quickly. I am now experimenting with various strains of bent with Chewings fescue.

In this locality poa annua seeds itself quite extensively, and it is often said that it would make a good tee alone. Due to its characteristics, I believe that it would be much better to use it as an aid to the other grasses than to try to use it alone. Poa trivialis is being used with success on some courses.

As the locality often governs what grows best, and what proves best for the tees, it is best for each greenkeeper to experiment as to what grasses are best for his tees.

The standards of tee maintenance are now higher than formerly, due to several factors. Players demand more. Courses in general are receiving a better standard of maintenance. Sand has almost ceased to be used for teeing up the ball, and we seldom see now the ugly blotches of sand all over the tees. Players using now the small patented tees, demand better, evener, more closely cut tees.

Tee Maintenance

Tees should be given almost as good treatment as the greens. They should be be cut whenever necessary, usually two or three times a week. They should be fertilized, composted, watered, whenever needed. The divots should be patched daily if time permits. The tee markers should be changed daily.

The grass on tees should be kept in

good condition at all times, growing a strong growth (not a weak growth from too much nitrogen), to cause the divots to heal as soon as possible. Some seed of the varieties used on the tees, can be used mixed with the compost or loam used for patching divots, if so desired; but, it has been my experience that if a tee is in good condition the divots will heal from the edges inwards more quickly than the seed will produce good grass.

Have your tees large enough, large enough so that the markers can be changed daily, and to have plenty of divotless space at all times. It is cheaper to maintain normally a larger tee than it is to repeatedly resod a smaller one.

Use the grasses best fitted for your locality, and maintain your tees to a high standard of maintenance. Remember that your tees are the starting points for those who play your course. Do they reflect your course and its condition? It's an old saying that "greens show the course," but it is getting more and more true that "by their tees shall you know them"!

Loam Baker Kills Weeds

By ELLIOTT D. PIERCE Greenkeeper, Kittansett Club, Marion, Mass.

THE loam and compost baker at Kittansett is twelve feet long by six feet wide. There are side walls on one side and both ends, about eighteen inches high; the other side is left open to feed the wood to the fire. On one end there is a small stack for smoke; this can be made of brick or some old iron pipe. I have three pieces of railroad iron running lengthwise to hold up sheet iron where the loam is baked.

The loam is placed on this sheet iron about four to six inches deep, and is kept turned so as to bake thoroughly. When the loam is too hot to hold in the hand, it is shoveled from the baker into a rotary screen. With a good fire it generally takes from 20 minutes to a half hour for one baking.

Fifteen dollars will cover the cost of constructing the baker. Two men in a day's time can bake from four to five cubic yards a day.

I have taken a sample box of loam that was not baked and a sample that was, both from the same pile, and kept both samples moist; the sample that was not baked produced weeds, while the baked one did not.

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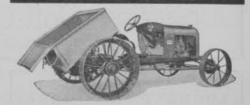
Try Lecco on your greens this fall and you will include this remarkably complete grass food in your 1930 budget.

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John McElliffee, greenkeeper at Winged Foot, is the handsome gent with his arms folded. He lines up his equipment in review for the Worthington camera man

It has been said that baked loam loses its goodness. I have taken a sample from the baker that was baked until it was burnt, and a sample of unbaked loam, and planted seed in both, and if anything the grass came up first in the sample that was burnt .- From the "Newsletter" of the N. E. Greenkeepers' Club.

FORM NEW HOUSE EQUIPMENT COMPANY

New York City.-Hector C. Adam, Inc., 196 Lexington Avenue, and D. E. Harrison, Inc., 110 East 42nd Street, New York City, manufacturers' agents serving the clubhouse equipment field, have combined. The new organization will be known as

Hector C. Adam Corp., with offices and show rooms at 196 Lexington Avenue, New York. The Adam Corp. has opened an office in the Builder's Building, Chicago, Ill., with Paul Kraeft in charge. For the past two years Mr. Kraeft has been Chirepresentative of the Champion Dishwashing Machine Company.

In eastern and southern Atlantic states, Messrs. Adam, Harrison, Henderson, Byrne, Mathews, Williams and Clement will keep in constant touch with the trade.

W. H. PILDITCH, NEW VULCAN CREDIT MANAGER Portsmouth, O.—Col. A. L. Mercer, presi-

dent, Vulcan Corp., announces appointment of William H. Pilditch, credit manager of the Vulcan Golf Company.

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