

How We Manage at Cedar Brook

By JOHN S. ANDERSON

Greenkeeper, Cedar Brook Golf & Country Club,
Scarboro, Ontario, Canada

IN writing about one's own course it may be permissible, but not proper, to let oneself be carried away by being over-zealous in extolling the natural beauty and wonderful condition of the greens and fairways. However, like the "little spot in Ireland," the little spot called "Cedar Brook," situated in Scarboro, just east of the city of Toronto, is one of natural beauty. A rustic stream, tributary of the Highland Creek, winds its way beautifully in and out through a most picturesque valley, dividing the landscape, the topography of which is of a gently rolling nature and ideally suited for golfing.

Developing the Fairways

The property consists of 159 acres, the course itself covering approximately 129 acres, and the balance of 30 acres is beautifully wooded with oaks, maples, cedar, pines, and beech. About a hundred acres were ploughed up and seeded in 1923 with a mixture of 20 per cent Chewings Fescue, 40 per cent Kentucky Blue Grass and 40 per cent Red Top, which was sown at the rate of 250 pounds per acre.

The soil the nature of which is medium heavy clay has a small area containing good sandy loam. Weather conditions were favourable and a good catch of grass was secured. Today the fairways are equal to those of many clubs much older. An application of bone meal fertilizer at the rate of 500 to 600 pounds to the acre was applied in the spring of 1927 and the fairways cross-disked with the cultipacker. The effect has been very noticeable in filling up bare spots, and the grass is rapidly thickening up.

Maintaining Bent Greens

The greens at first were all of a temporary nature and seeded with a regular grass seed mixture for putting greens. Nine greens have been rebuilt in more suitable locations, and planted out with bent grass stolons which have turned out to be most satisfactory in every way, and far superior to the ordinary type of seeded green. The qualities for a bent grass green when properly managed are as follows: even texture,—smoother putting surface,—more resistance to winter kill,—less liable to



Right, John Anderson; left, M. A. Chadwick

disease,—eliminates weeds and weeding by producing a heavy covering,—uniform color.

Light and frequent applications of sulphate of ammonia about every two weeks, and top dressing with good sandy loam has been found to be very beneficial in keeping this type of green in first class condition.

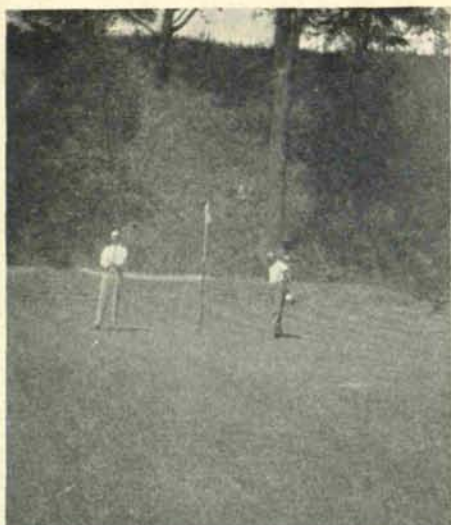
An abundance of water is necessary as the natural home of bent grass is in low lying land, and along stream banks and beds where there is an abundance of moisture. This type of green cannot be successfully taken care of unless a water supply is available, with which to continually use a sprinkler system, as water is one of the most important items of maintenance.

Experimenting with Seed From Nursery

A supply of Washington strain bent stolons was secured three years ago and a bent grass nursery planted out, which has supplied most of the bent for our new greens and has saved the club many dollars. An excellent supply of bent was secured from Mr. Alan Bland, Colbourne Street, Toronto, which has been most satisfactory in every way. An experiment is being conducted this season by saving the bent seed from the nursery which should turn out to be very pure, but nothing can be said about this until an opportunity to test the germination is conducted.

Tree and Sod Nurseries

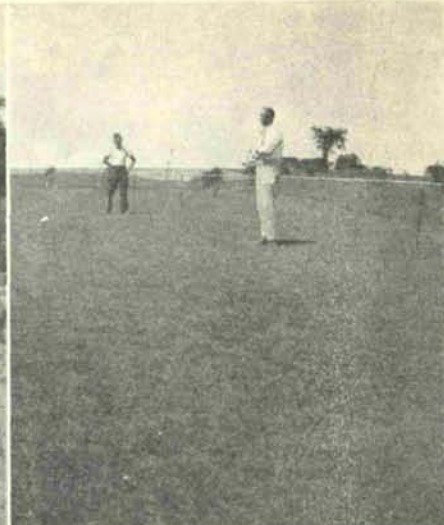
A tree nursery of about 7000 seedlings of different varieties secured from the Government three years ago, was planted out, and an additional 7000 were put in again this year. These young trees will be very valuable



New Number Seven Bent Green at Cedar Brook. Mr. Chadwick, left, Mr. Anderson, right



Mr. Anderson in his Tree Nursery



Showing Skinner System of Sprinkling used to start Number 8 along at Cedar Brook

assets in the future for the purposes of reforestation and beautifying the grounds. Shrubs of many kinds have been planted for the purpose of slipping and propagation in the future.

A sod nursery is a most important item, as frequently patches of grass in both fairways and greens become killed out from various causes and it is a big relief to know that these patches can be repaired quickly and effectively by re-sodding, thus preventing unsightly scars.

Installed a Good Water System

A water system installation of the air pressure type with an electric motor and automatic electric control together with an auxiliary gasoline engine, in the event of the electric current failing has been found to work exceedingly well. Five controls radiate from the pump house to different sections of the course, the main pipe lines consisting of 2 inch pipe and gradually reducing to $\frac{3}{4}$ inch at the end of the line. Each control line operates five or six greens, one section going direct to the club house building.

Pumping equipment is the Worthington heavy duty type, with a seven-horse power Century motor controlled by a Cutler-Hammer automatic switch coupled to a magnetic control.

Distribution of Labor

The course maintenance is taken care of by a staff of 10 men. Four men attend to the eighteen greens which are all cut with hand machines, each man taking 4 or 5 greens according to size. Each man is responsible for the condition of his allotted greens and also attends to the weeding, fertilizing, matting, top-dressing, etc. One man is responsible for cutting the tees and moving discs every morning and scythes or does other necessary work when required. One man with a Staude tractor

and 5-gang Shawnee mowing equipment, looks after the fairways and part of the rough. One man cuts the rough on hillsides and other parts of the course with a one-horse hay mower. One man with a Staude tractor, which is used as a power plant for driving compost machines to screen top-dressing material, along with two extra men take care of the preparation of top-dressing material, a good supply of which is always kept on hand, because bent grass greens require more frequent top-dressing than ordinary grass greens.

The five new greens constructed last year are all well trapped and the greater the number of traps and bunkers on the course the greater will be the maintenance cost in proportion.

Temporary Water System for New Plantings

One new green, number 8, has been constructed this year. This green is located in an orchard and trapped on both sides. Two weeks' time was taken to mould the green and traps and stolons were planted on June 15th. Today, six weeks afterwards, there is almost a solid mat of grass and this green will be in condition to play on about August the 31st, or ten weeks from the time of planting. The Skinner over-head irrigation system of watering was used by us for the first time on this green, and proved to be a great labor saver.

Machinery and equipment of all kinds must be kept in first class condition for the best results. Repairs and overhauling are done during the winter months. In handling a staff of men I encourage co-operation, strict discipline, and select as nearly as possible the men who are best suited for each particular job.

I am enclosing some snapshots of some of the greens along with one of our Secretary, Mr. M. A. Chadwick, who has assisted me in writing this article.

The A B C of Turf Culture

Soil Characteristics and How Plant Food Becomes Available

By O. J. NOER

FERTILIZERS are only effective when climatic and soil conditions are favorable for the growth of turf grasses. Frequently the distracted green chairman or greenkeeper attributes poor turf to a lack of plant food, where other unfavorable conditions are equally important, and when fertilizer applications result in failure may unjustly condemn the fertilizer. Sometimes poor growth on newly planted greens is traceable to the use of too heavy soil construction. The puddled soil becomes hard and the roots fail to obtain much needed oxygen. Fertilizers will not overcome the bad effects of faulty drainage. Turf on coarse sandy soil, or thin soils covering gravel knolls rarely obtains sufficient water. The wise greenkeeper corrects or modifies these conditions before making large expenditures for fertilizer and is well repaid for the greater effectiveness of the fertilizer.

Great care must be exercised in the selection of fertilizers, because it takes time to correct the effects produced by the injudicious use of some materials. The amount and availability of the plant food constituents is of first importance. Leather is high in nitrogen, but of little value because decay does not take place in the soil. The nitrogen of sulphate of ammonium is ordinarily immediately available. Between these extremes materials of varying degrees of availability can be chosen. Acid phosphate is a far better source of phosphoric acid than bone meal for new seedings because of its greater availability. Certain plant food elements must be used with caution because they unduly encourage clover. The secondary effects produced in the soil are also important. Some materials increase while others decrease soil acidity and thus affect clover growth. All these factors must be considered in choosing fertilizers.

The particular plant food elements and amounts which should be used depend upon local soil conditions, and satisfactory results are obtained only when the soil conditions are taken into consideration.

Soils differ greatly in their power to sustain turf growth partly as a result of plant food deficiencies. Certain soil types are notoriously high in some elements and low in others. Some are likely to be low in all plant



O. J. Noer

Editor's Note: For the past four years Mr. Noer has investigated the value of various fertilizers in relation to golf turf at the Soils Department, University of Wisconsin, under a fellowship established by the City of Milwaukee.

elements. Naturally soils which have been heavily cropped need more fertilizer than those which have been carefully handled and frequently manured. Black soils, while often superior to the light colored soils may have been so badly depleted of plant food that new seeding fails to produce desirable turf. Had deficiencies been recognized prior to seeding, time and money could have been saved and good turf obtained.

Soil Deficiencies Confined to Three Plant Food Elements

Turf depends upon the soil to supply seven of the ten necessary plant food elements. All soils contain abundant supplies of four of these, so only one or more of the three elements, nitrogen, phosphorus and potassium, need be added in fertilizers. These are usually referred to as ammonium, phosphoric acid and potash.

Total Amount of Plant Food in Various Soils

Soils consist of a mixture of humus and organic matter and solid mineral particles. Practically all of the nitrogen exists in the humus and the elements phosphorus and potassium occur principally in the mineral portion, although the humus also contains limited amounts of both. Sand particles consist of silica mainly, and hence are low in plant food elements. It is in the silt and clay particles that phosphorus and potassium are most abundant.

Peats and mucks, consisting mainly of partially decayed plant residues, are high in nitrogen and often low in phosphorus and potassium. Sand usually contains very little humus and the finer mineral particles, and is low in all plant food elements, especially if derived from sand stone, but may contain sufficient potash if derived from granite rocks. Sandy loams, loams, and clays vary in their humus content and are low in available nitrogen if low in humus. They are usually well supplied with potassium, but may need additional phosphorus, particularly on new seedings.

The plow layer of an acre of good loam soil contains

roughly about 2500 to 3500 pounds nitrogen, 1000 to 1400 pounds phosphorus and about 40,000 pounds potassium. Sands usually contain less than one-third to one-half as much nitrogen and phosphorus, and may be low in potassium. While peats and mucks may contain eight to ten times as much nitrogen, they are low in phosphorus and potassium.

The roots of closely clipped turf rarely extend beyond several inches and obtain most of their plant food from this shallow layer of soil.

Even the sandy soils contain a sufficient total plant food to support growth over a number of years, if the turf could draw upon the entire supply, but only materials dissolved in the soil water are available, and frequently solution from the insoluble soil materials does not take place rapidly enough to satisfy the demands of the turf. Actively growing turf requires a uniform and continuous supply of soluble food, and unless such conditions are maintained in the soil, poor growth results. In a general way, soils highly charged with plant food yield soluble material more rapidly than those of lower content. Solution takes place more rapidly in sandy soils than heavy soils, so it would be folly to attempt to raise the total plant food content of sands to equal that of heavy soils.

Amounts of Soluble Plant Food in Soil Solution

During the growing season, only small amounts of dissolved plant food are found in the soil under turf grasses. These amounts are so small that only exact chemical methods are required for their determination. Soluble nitrogen is rarely found. Just as soon as solution occurs the nitrogen is taken up by the turf roots. A million pounds of soil water, under these conditions, rarely contains more than several pounds of soluble nitrogen. In fallow cultivated soil as much as 30 to 50 pounds of soluble nitrogen may be present. The dissolved potassium is never very high, and the soil water may contain less than a pound of dissolved phosphorus. These amounts are never sufficient to maintain growth over extended periods. Conditions favoring rapid replenishment of the soil solution as the turf roots remove food must be maintained if normal growth is to take place.

How Plant Food Becomes Soluble

Soluble nitrogen results from decay or decomposition of the humus or organic matter of the soil, by soil bacteria and fungi. The nitrogen existing even in soluble organic matter is not directly available to the plant, but must be resolved into simple forms. A host of bacteria and fungi attack the complicated organic compounds and release nitrogen in the form of ammonia. Then specific

groups of organisms rapidly convert the ammonia nitrogen into nitrate nitrogen. This is the form preferred by most plants. During decay the carbon is converted into carbon dioxide, or carbonic acid, and any mineral plant food elements contained in the organic matter are released in forms available to the plant. Phosphorus and potassium are also dissolved by the soil water from the insoluble mineral soil constituents.

Factors Affecting Rate of Solution

Naturally the first essentials for an adequate supply of soluble nitrogen is in the supply of the various groups of organisms which bring about decay. Dark color in a soil is usually an indication of the presence of humus, and large nitrogen content. Yet if black soils have been under crop for a long period without additions of manure or green manure crops, soluble nitrogen may not be produced rapidly enough to satisfy the needs of the turf. The residual humus resists further decay and is of little value except as it improves the physical condition and water-holding capacity of the soil. This fact is frequently overlooked on new seedings. An established turf increases the humus content of the soil. As new roots are formed the old ones die and upon decay their nitrogen is again converted into forms suitable for use. It is necessary only to supply sufficient nitrogen to balance the losses due to baking and removal of clippings.

All well drained soils contain hosts of bacteria which multiply rapidly if conditions permit. The organisms which liberate available nitrogen require oxygen and water. They are most active when temperatures range from 70 to 90 degrees Fahrenheit, and in fact cease operations during the cold winter weather. Activity begins again with the advent of warmer weather in the spring. This is Nature's method of conserving nitrogen during the period when plants are dormant, because nitrate nitrogen leaches from the soil if not taken up by the plant roots. If the soil is too acid the activity of the organisms which convert ammonia to nitrate nitrogen is greatly retarded and in extreme cases ceases entirely.

Phosphorus exists in the soil as lime, iron or aluminum phosphate. The two later predominate in acid soils. The rate of solution depends upon soil reaction, state of division of the phosphate, and presence of carbonic acid. Acid soils do not yield phosphorus as readily as non-acid soils because iron and aluminum phosphates are less soluble than lime phosphate. For this reason phosphate applications for new seedings should be heavier on acid soils than on non-acid soils. The finer the individual units containing the phosphorus the more rapid does solution occur because of the larger surfaces exposed. The prin-

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A Chat With Our President



John Morley

EACH day has its problems to be solved. Those left undone increase the number for the next day.

LEARN to be an executive. Some day your club may decide to have a general manager. If you can show them that you have this qualification you will stand a good chance to get the position.

ARTHUR JENSEN, Fargo Country Club, Fargo, North Dakota: If your soil has a tendency to crack open during extreme dry weather try pulverized charcoal.

SOME men are always in the air, living in the seventh story over a vacant lot.

WE have not heard lately from Guy C. West, Secretary of the Greenkeepers Club of New England. Guy, the boys would enjoy reading another article from your able pen.

THE weeds hardest to eradicate are chickweed and pearlwort. The former can be eliminated by spraying with ammonia sulfate. The latter should be cut out. You will have no pearlwort if you do not roll too heavily and water too superficially.

ALEX McPHERSON of Detroit Golf Club, like myself, is unable to hear complaints—one advantage deafness gives.

THE best way to Success is to try and keep up with the times.

IF we are to double our membership all of us must put our shoulders to the wheel and help.

AT our first annual convention held at Chicago, it was a pleasure to observe mingling with our members at headquarters, Alex Pirie, President of the Professional Golfers' Association. Besides being a good teacher, Alex is a good greenkeeper. Old Elms proves it.

A LOT of golf courses are like a lot of people I know. They never send for a doctor until the case becomes critical.

BERT SHELDIN of the Country Club, Cleveland, Ohio, has a course situated close to old Lake Erie. Bert has a hard time when the wind is blowing from the lake to keep his putting greens from burning up.

KEEP this magazine on your desk, so that when you want to get any supplies in a hurry you will have the addresses of the various firms which handle just what you need.

EMIL LEOFFLER came in for a good deal of praise for the condition of his course during the National Open at Oakmont, Pennsylvania, and Emil deserved it. His fairways are better than many putting greens.

DOING something every moment doesn't necessarily get you anywhere. It is what you do and how you do it that counts.

THREE stages of womanhood compare to Faith, Hope and Charity. Now if a lady is kissed at the age of eighteen that's Faith. If she is kissed at the age of twenty-five that's Hope she will be kissed again. If you kiss a woman of forty, well, that's Charity. (*Editor's note:—You'd be surprised.*)

THE man who throws his whole self into his job seems somehow to draw new strength and energy from its uphill and downhill exactions.

READ W. A. Buckner's article on golf course irrigation in the August issue. It is very instructive. Some day we will all be able to water fairways and putting greens without the aid of rubber hose.

POEA ANNUA appears to be an interesting subject this season. Write and give us your views on it.

JOHAN McNAMARA is the Dean of the greenkeepers of the Pittsburgh district. Everybody on the hills of Pittsburgh knows John.

DON'T forget we have a Death Benefit fund in connection with our association, which furnishes the members with insurance at a very low cost.

ALL things being equal, patronize those who help to support our magazine.

LIFE does not start on equal terms, but it ends for all alike.

GET in the habit of visiting at least once a week a neighboring course. We can all profit by observing what the other fellow is doing. Besides, it tends to promote a better fraternal feeling.

WE believe in economy, but not false economy. Remember the members will not stand to have the course revert back to a cow pasture.

LEROY JOHNSON, Yankton, South Dakota, has sand greens to contend with. LeRoy is one of our charter members, and would like to hear from other sand-greenkeepers.

YOUR friends have helped more than a little to make you, and it is only through making good with them that you can hope to hold what you have.

IF you know of a club that is in the market for a greenkeeper please notify our Secretary. We have several applicants seeking positions.

CHARLES SPENCER of Fairlawn Country Club, Akron, Ohio, is doing good work to bring his club up to date.

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President John Morley, explaining the characteristics of several strains of bent to Mrs. Rees, wife of Captain David L. Rees, Vice-President of the National Association of Greenkeepers of America. Taken in Mr. Morley's nursery at the Youngstown Country Club, Youngstown, O.

DON'T do your experimenting on your putting greens or fairways. Do it in the nursery. If you have no nursery by all means get one started.

WON'T you help us to increase or double our membership? If you know of anyone who is eligible to join send us his name and address. We will do the rest.

IT is the little things that we neglect that help to cause us so much trouble. The big things seem to take care of themselves.

WHEN in the Philadelphia district visit the White-marsh Valley Country Club. The greenkeeper of this club has helped to create a wonderful course.

ONE great trouble in life is we always remember what we ought to forget.

DON'T forget that our next annual convention will be held before March first, 1928. Now is the time to start laying aside expenses for the trip, and don't forget we are going to have a golf show.

HOW many veins are there in a blade of blue grass? You ought to know.

HUGH LUKE of Garden City, Long Island, New York, certainly has a fine climate to live in. When I visited his course a few years ago I had to wait half an hour for a train. I enjoyed the atmosphere so much while waiting, it was the only time I can remember that I have got any pleasure out of waiting for a train.

LET our membership be mellowed by good fellowship, humanized by charity, and dedicated to service.

WHY do some of the foreign grasses that infest our putting greens crowd out the finer grasses such as the bents? Everybody answer.

WHEN you know that you spend the club's money more economically than you do your own, you can realize that you are on a road leading to executive ability.

CHARLES L. REAM in his article "War Against Ants" says that a Queen ant lays 80,000 eggs every day. Some greenkeepers think they lay twice that many, judging from the piles of soil they throw up over the putting greens each day.

The National Association of Greenkeepers of America

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Month by Month With the Trees

By C. M. SCHERER

Principal of The Davey Institute of Tree Surgery, Kent, Ohio



Planting Deciduous Trees

TREES like humans are living things. And it is an infallible law of nature that all living things must sooner or later die and be returned to the elements from which they came. Although trees have been known to live for centuries and even thousands of years, too often the most desirable trees die before their time and have to be replaced by new ones. Then too, the whims and fancies of individuals many times demand trees where none is located. At other times the vandal's axe has destroyed trees where they should remain. The economic needs of civilization causes still another tremendous drag on our natural resources of standing trees. All of these destructive factors working together are denuding our forests, lawns and recreational grounds much more rapidly than nature can rebuild them.

By intelligent and careful aid it is possible to assist nature to the extent that in a comparatively short time it will be possible to again have the wonderful trees which are both an esthetic and intrinsic boon to man.

Desirable Seasons for Planting

One of the planting seasons is now at hand. In certain sections of the country, especially the southern states and the far western states, fall planting is the best. During the coming months in these two sections, great quantities of water are available for the newly planted trees and at the same time the temperatures are mild enough so that freezing to death is not a serious hindrance. In other sections of the country, namely the eastern and northern states, fall planting is not so good as is spring planting. However, the rush of other work in the springtime usually makes it necessary to do as much fall planting as possible in those sections where it is only second best. Fall planting is not as desirable as spring planting in the eastern and northern states because within a few months the ground is frozen hard so that the roots become inactive and cannot supply to the tops of the trees the water which is constantly evaporat-

ing, even in freezing weather. When evaporation has proceeded to dryness, the tree dies and even if it is only partly killed, it continues to be a stunted, unsightly specimen. With these facts in mind it is quite evident that fall planting must be carried out with the greatest care and only such trees should be planted as have the best chances of surviving the rigors of winter.

When the site for planting the tree has been selected, a study should be made of the soil, water and weather conditions existing at that particular spot. Then trees should be selected which are best suited to the place in which they have to grow. For illustration, it would be foolishness to plant a sugar maple in a spot where the soil is heavy, wet and inclined more or less toward being swampy. This is true because the finest specimens of sugar maple grow in well drained moderately light slopes and knolls. In a like manner, it would be a poor practice to plant a pin oak where a sugar maple should grow, because a pin oak grows best in the wet, heavy soil. The American elm is so adaptable that it can grow successfully either in the wet or dry place although it prefers the wet ground. Tulip and walnut trees must be planted in rich, deep soil while locust and some of the oaks can be planted in a relatively poor soil.

Choose Your Varieties Carefully

When the site has been selected and a study made of the conditions, the next problem is to determine the trees to be selected. Too often poor varieties are selected because of their rapid growth. Usually the rapidity of growth is the only desirable feature of these trees. The silver maples, most all the poplars and ailanthus come within this group. Many of the desirable trees grow almost as rapidly and will live twice as long under adverse conditions as will the fast growing ones.

There is considerable difference of opinion as to the best trees to plant. However, a comparatively short list will include most of the desirable trees. Among the oaks

we may list the red, scarlet, white and pin as the best. The Norway, sugar and red maples are the only ones of this group worthy of consideration. Our elm selection should be made from either the American or English variety. Both the American and European lindens are desirable trees. The sweet gum and tupelo can also be included in our list.

In some sections of the country where it is exceedingly difficult to get many trees to grow, it is often times necessary to select the poplars, in spite of the fact that they should not be considered in other sections. The mossy cup oak, the hackberry, the honey locust are better trees, but under the adverse conditions, have an exceedingly difficult time growing into desirable specimens.

Why Nursery Trees Are More Resistant

Obtaining the trees for planting is another problem worthy of some serious thought. Many individuals gather trees from the woods because of their cheapness. One usually finds, however, that when cheapness is the only recommendation given for an article, it is often times best to take the more expensive. This applies equally well with trees. The tree from the nursery is almost invariably best because during its growth, it has been prepared for the shock of transplanting. The chances for the nursery trees growing are much better than are the chances for the one taken from the woods.

Usually the nursery tree is better shaped and makes a more slightly specimen than does the tree from the woods.

The size of the tree to be transplanted depends almost entirely on the amount of money the individual is willing to invest in the trees. One secures the most for the money expended by purchasing trees that are about two inches in diameter. Such trees are small enough to be readily transplanted and at the same time are large enough to make a worth while showing. Larger trees cost more money, have to be transplanted much more carefully and the chances of failure are increased materially with the added size of the trees.

Proper Preparation Before Planting

When the site for the trees has been selected it is necessary to prepare the ground for receiving the tree. The common practice is to slight the preparation and this only leads to future disappointment. For a two inch tree, a hole should be dug at least three feet square and two feet deep. Three feet deep is even better. Fill the bottom of the hole with rich top soil to within a foot of the top. Have enough additional top soil on hand to fill around the tree when it is put in place. The planter is then ready for the tree.

When a tree is dug special care should be exercised to destroy as few roots as possible. Those which are

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Start War on Fall Weeds

By JOSEPH VALENTINE

Vice-President, National Association of Greenkeepers
of America, Merion Cricket Club, Philadelphia, Pa.

FALL is fast approaching, and with it comes the crab and goose grass, which is commonly known as "fall grass." In fact in many places it has made its usual appearance. This means, fellow greenkeeper, that we must get busy, and combat this dreaded enemy.

Many greenkeepers are doing all they possibly can to eradicate this weed, but there are also many who are practically doing nothing along this line. It is to this class that I want to emphasize the importance of doing away with this menace to our golf courses.

No doubt many have a method of their own in combating this enemy and I feel sure if their particular method is good, they are certain to succeed. But, it is one thing to have a method, and use it, and still another thing to have a method and not use it. When you have decided on a certain line of attack, give it a thorough trial, and you are bound to obtain some results. But on the other hand if you do not give any method a fair trial, how are you to know whether you are right or wrong?

Ammonium Sulphate Excellent Control

For many years our course was covered with crab and

goose grass, and am very glad to state that we have been fortunate enough to reduce it to a minimum. In the first place do not let this grass go to seed. Check its future growth by the spreading of the seeds. Ammonium sulphate has acted as a wonderful check in overcoming this turf condition. We have been using it very freely, and have applied it very frequently, using about an average of 50 lbs. to the acre. When it is raining our men are instructed to don their rain coats, boots, etc., and go and apply a good application of ammonium sulphate, where same may be needed on the fairways, for this is the best time to apply it. When applied dry it should be mixed with top-dressing or sand. The places which need it the most are the poor spots on the fairways, for you know this grass will thrive extensively in these spots. I would not recommend the use of any spreading apparatus in applying this material. Let this be done by hand, and then the men are certain to apply the material where it is most needed. Since carrying on this method, crab and goose grass have been reduced on

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Greenkeeper and Chairman Hand in Hand

By E. A. CROMBIE, Greenkeeper
Edgewood Country Club, Wilkinsburg, Penna.



*View of Clubhouse at Edgewood Country Club,
Wilkinsburg, Pa.*

AS they are of the most importance, I will begin with the care of the greens.

Four men have five greens each to mow, weed and take care of in general. This includes practice green and turf nursery. All greens are mowed every day during the playing season. These men also mow their tees and around their greens three times a week and attend to the tee boxes. Each man has a hole cutter and changes the holes as often as needed, which is usually four times a week. Each of these four groups of men has a tool house in their own section with all necessary tools as this saves time in preference to storing them in the main tool house.

Tee markers are changed every day, and the damaged spots from each day's play are dressed with seed and compost.

Fourteen Hours for Cutting Fairways

One man mows all the fairways twice a week with a Toro tractor and five Toro units. This takes about fourteen hours at each cutting.

In his spare time between the two cuttings of the fairways he drops off two units and sets the other three units to cut the rough three inches high. One man mows rough with the Staude tractor and three units. He mows the places that are too steep for the Toro, and does other work when not mowing the rough.



*Showing what is expected of a Fairway Mowing Outfit
at Edgewood*

Two men mow with scythes in places the tractors cannot reach. These men also roll the greens and tees and take care of bunkers.

One man works with the truck and waters the greens and tees in dry weather.

When we worm or dress the greens all the men help after their regular morning's work is done. It takes about fourteen hours to dress the greens.

One man takes care of the lawns, shrubbery and avenues around the clubhouse, and raises flowers for use in the clubhouse.

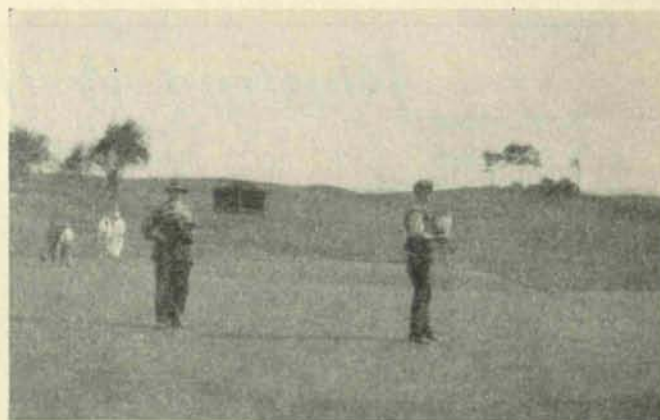
I think the men take more interest when they have their own work to be responsible for.

Fertilizing with Cahoon Seeders

We fertilize our greens as often as needed with sulphate of ammonia mixed with dry sand and spread with Cahoon seeders. Two men will fertilize ten greens in about ninety minutes and three men follow them up with the hose and water it in.

I think it is very important to have co-operation between the chairman and the greenkeeper, and am glad to say that I have no complaint whatever on this score.

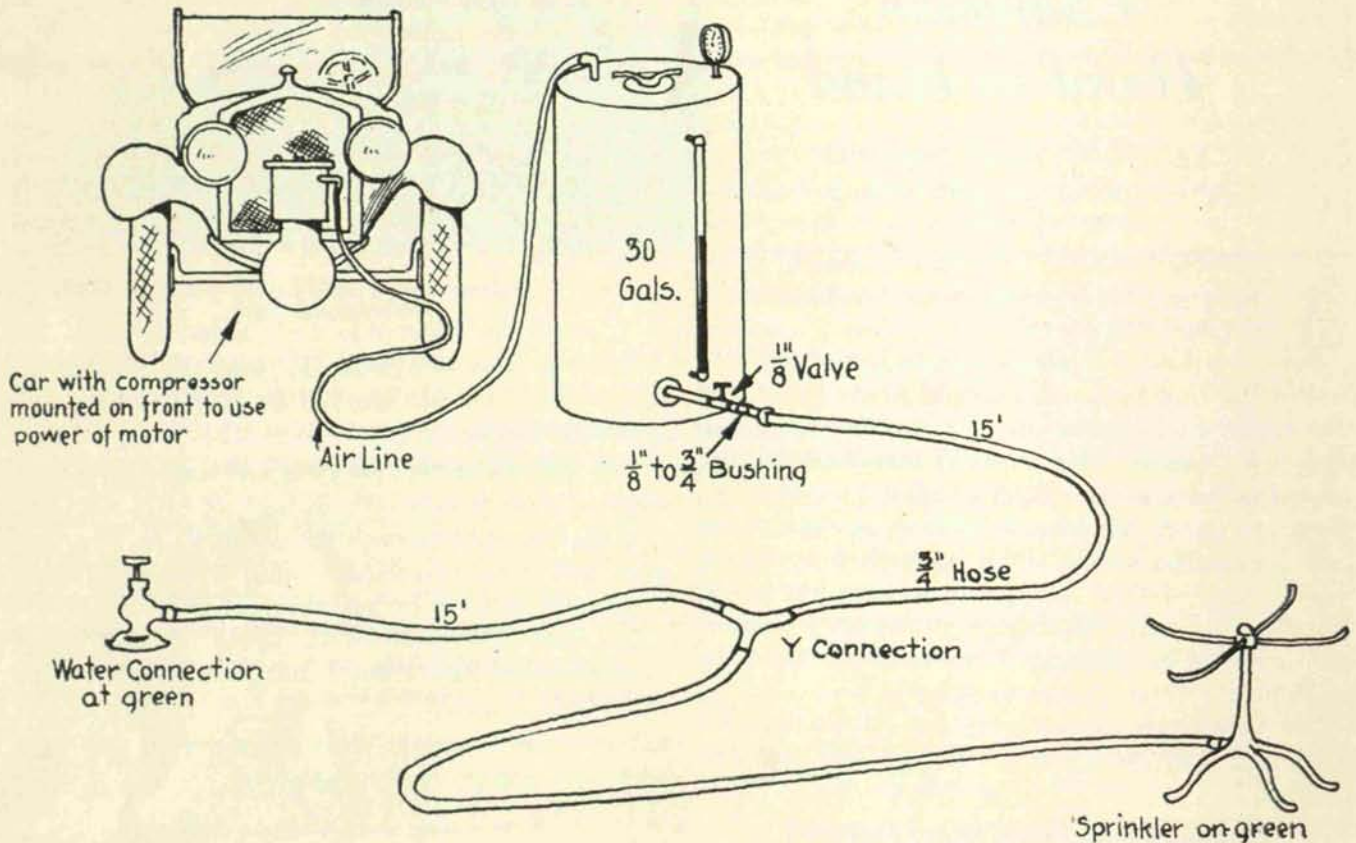
(Continued on page 39)



*Spreading Sulphate and Sand with Cahoon Seeders at
Edgewood*

How I Apply Sulphate

By LAWRENCE HUBER
Greenkeeper Elks Country Club, Worthington, Ohio.



I AM proud to say that I am a Charter member of the National Association of Greenkeepers of America, and I want to tell other greenkeepers of a little outfit I have constructed for applying sulphate of ammonia to our greens.

I have a power take-off on my Ford car that runs an air compressor. I dissolve the sulphate in a bucket of water, and put it into a pressure tank with a one-eighth discharge pipe.

I check up the water pressure at the green with a gauge, and then run the compressor to equal or just a little higher than the water pressure at the green. I use a Y connection from water and sulphate, and this goes out into a single hose to sprinkler or nozzle on the green. I never have any effects of burning show up on my greens in using this distributor.

Any greenkeeper can construct this simple outfit from the accompanying drawing. If not entirely clear, write me direct, and I will help you in any way I can.

Blasting Without Dynamite

By MARTIN RASMUSSEN
Greenkeeper St. Paul, Minnesota.

LARGE boulders, or "niggerheads" as we call them in Minnesota, are often thrown to the surface by the frost in the spring, and sometimes they are situated so that a greenkeeper cannot remove them with dynamite.

A very simple method may be used to break such stones.

First dig a trench around the boulder deep enough

so that the bottom of the stone may be seen. Then lay brush or old pieces of wood around in the trench and set fire to it. Keep this fire going for from four to six hours, depending upon the size of the boulder.

When the stone is red hot, throw several pails of water on it, and it will soon crack and crumble away, so that it may easily be removed with a stone boat or wagon.