

Coarse sand is much better than fine for the reason that it is much easier to maintain in satisfactory condition, and it does not blow away in the wind, or wash away so badly in case of rain.

In order that bunkers be absolutely fair, they should be raked regularly, in order to remove footprints, and so that after a rain the player does not get a perfect lie. One of the best rakes for this purpose is one made with teeth like a saw, and of such a size that they leave grooves in the sand about two inches apart and about an

inch deep. This will insure, that wherever two players go into the bunker or trap, they will both get exactly the same lie.

Grass hollows and mounds should be kept cut, if anything, a little closer than the ordinary rough. This is particularly true of the grass hollows, the reason being that they are in most cases used back of greens to catch a shot that has been too strong, and where the penalty should only be one half a stroke instead of a full stroke.

## *Unity of Purpose for Greater Progress*

THE United States Golf Association, Green Section has for six years carried out a program of scientific research and experimental work covering the selection, growth and maintenance of golf grasses, as well as the protection of golf turf from destructive insects, grubs, animal pests and turf diseases.

Organization for the betterment of the profession of greenkeeping throughout the United States and Canada is the educational program of The National Association of Greenkeepers of America, and this program will be carried out through the pages of The National Greenkeeper, publishing contributions received from practical greenkeepers of experience.

Having a full appreciation of the value of the experimental work conducted by the U. S. G. A. Green Section, and its direct benefit to the greenkeepers of America, the following letter of congratulation was delivered to Mr. Wm. C. Fownes, Jr., President of the United States Golf Association, at their annual meeting held at the Pittsburgh Athletic Club, Pittsburgh, Pennsylvania, on January 7:

January 5, 1927

Mr. Wm. C. Fownes, Jr., President,  
The United States Golf Association,  
110 East 42nd Street,  
New York, N. Y.

My dear Mr. Fownes:—

I wish to congratulate you upon your message to the member clubs of the United States Golf Association which appeared in the December 1926 Green Section bulletin.

The establishment of a \$30 yearly membership fee, which includes the Green Section service, is conclusive evidence that the U. S. G. A. wishes to do the greatest amount of good for the greatest number of golf clubs throughout the country.

The new program as a whole is a stroke of genius which will set apart the 1926 Executive Committee in the history of your association.

It gives me the greatest amount of pleasure to know that the work of the Green Section, so ably started and carried on by Dr. C. V. Piper, Dr. R. A. Oakley, and their assistants, will go forward with the support and protection it so well deserves.

If at any time the Green Section requires any information or assistance this organization can give, I am sure that the greenkeepers of America will co-operate to the fullest extent.

Sincerely yours,

John Morley, President.  
National Association of Greenkeepers of America

Mr. Fownes' reply follows:

Mr. John Morley, President,  
The National Association of Greenkeepers,  
407 Caxton Bldg.,  
Cleveland, Ohio.

Dear John:—

I duly received your letter of January 5th at the time of the Annual Meeting of the U.S.G.A., and I must apologize for not having made acknowledgment of it earlier. It was a great pleasure to me and to my associates in the Association, to know that you personally, and the National Association of Greenkeepers of America, heartily approved of the action which was taken by the delegates in consolidating the membership of the Association, and bringing the work of the Green Section more directly under the control of the Executive Committee of the U.S.G.A. I think we all believe that the Green Section work is of the greatest importance and should call for the best attention which we are capable of giving it, and I am quite confident that under the present lineup we shall see its sphere of usefulness extend further each year.

Best regards.

Yours very truly,

Wm. C. Fownes, Jr., President, U.S.G.A.

# Spring Seeding

YOU can't for the life of you think of a golf course without thinking of *grass*. The two are inseparable. Long expanses of thick, luxuriant grass is one of the things that makes golf popular. It is the very "foundation" of the sport. No wonder then that making and keeping good grass on a golf course calls for the best of talent and entitles the greenkeeper to regard his task as a real science.

The immediate problem of the greenkeeper is the conditioning of his course for spring play. It is our experience that 70 per cent of the northern clubs seed in the fall and only 30 per cent in the spring. That situation is accounted for from the fact that fall seeding has become accepted as best from a results standpoint.

Grass from fall seeding has two distinct advantages. It takes deeper root and stools or tillers out, thus fortifying itself against adversity. The second and very important advantage is that weeds are combatted more effectively by fall seeding. They come up in the spring full of ginger but find healthy vigorous grass has had several months' head start and is occupying the available space.

Spring seeding gives these pests greater opportunity to flourish, but from present indications more clubs than usual will be *forced* to do spring seeding this year. Unfavorable weather was abundant last fall and scores of new and established clubs were compelled to lay aside their seeding plans. Few will consent to wait until next fall but rather will speculate on spring sowing.

## *How Redtop Discourages Spring Weeds*

Authorities tell us that about 20 per cent more seed should be sowed in the spring than in the fall because of the greater hazard. It has been generally contended that in the New England States spring sowing is preferable but an able informant at Amherst, Massachusetts, expresses himself as follows: "I much prefer fall seeding to spring seeding in New England. I would use exactly the same grasses for either sowing, spring or fall, except that in the spring seeding I would add at least 20 per cent more Redtop than I used in the fall. I am a great believer in the use of Redtop to help check the weeds. Of course extensively used it is not desirable."

Regardless of what the consensus of opinion and your own conviction in the matter may be, there will always be a liberal sowing of seed during the spring months. Psychologically if not practically spring is sowing time. It seems only proper to take advantage of the period when everything planted or dormant seems to fairly spring out

of the ground. This undeniable tendency plus a carry-over of frustrated or incompleated plans of last fall, means there will be considerable seed sowed on golf courses this spring.

## *The Best Time to Spring Seed*

There remains then the important question *when*. One experienced architect says: "If seeding must be done in the spring, I find it can be very well done especially for fairways if the seed is sown on the ground when it is in a honey comb condition and not rolled or raked in." That of course applies to resowing thin turf or original seeding on new ground that was put in proper condition the previous fall. Where only the rough grading has been done and the top soil is not smooth and fine it is better to wait until the frost is out of the ground and the soil readily friable. Every day counts in spring sowing because the grass should have every opportunity to become established before the usual period of hot, dry weather.

## *Cool Summer Predicted in Northern States*

Of course if we are to swallow the predictions of some weather prognosticators the summer of 1927 will be extremely cool. If these predictions come true then we may expect a very wonderful summer for grass and spring seeding will set a record for turf production. Those who wish to consider further the forewarning of two disagreeing weather critics should buy a copy of January "System." Weather probabilities for the year are very interestingly discussed. There is good cause to choose seed carefully for sowing at any time of the year but especially in the spring.

## *Pure Seed First Consideration*

Weeds never need encouragement but during the period of rainy weather they make surprising headway especially if sowed in impure seed. Beat them at their own game by sowing pure vigorously growing grasses. This no doubt is the thought behind the Amherst suggestion that Redtop be favored in a Spring seeding. In other words if a four part Blue Grass to one part Redtop fairway mixture is used for fall make it three to one for spring. We believe this suggestion to have considerable merit. Redtop germinates quickly and may be obtained practically weedless. This year because of the very low price German Bent will be used freely on fairways. It grows very quickly and will give weeds no cause for comfort.—*Courtesy of O. M. Scott and Sons Company, Marysville, Ohio.*

# Keep the Weeds Out of New Turf

By W. J. ROCKEFELLER  
Greenkeeper, Inverness Club, Toledo, Ohio



W. J. Rockefeller

A VARIED career including twenty-three years on a farm, a musical education, apprentice to an upholsterer, and later drifting into hospital work at Binghamton, New York, and Toledo, Ohio, finally ended in my taking up greenkeeping at Inverness in 1903. Perhaps the experience in hospitals for the insane gave me some understanding as to how to handle golf bugs. At any rate I do not think my musical talent gave me much background in starting the construction work on the Inverness course; it must have been my farming experience and my love of the game. Being a left handed player myself, my idea of the perfect course is one which can be played in Par by a southpaw. Inverness, however, from the viewpoint of the golfer, is what is considered a difficult but fair golf course.

For more years than I can at this time recall, I have played the game of golf with a great deal of enjoyment, and I have tried to lay out and construct golf courses that are a fair test of skill. Among these are Heather Downs at Toledo; Napoleon Golf Club, Napoleon, Ohio;

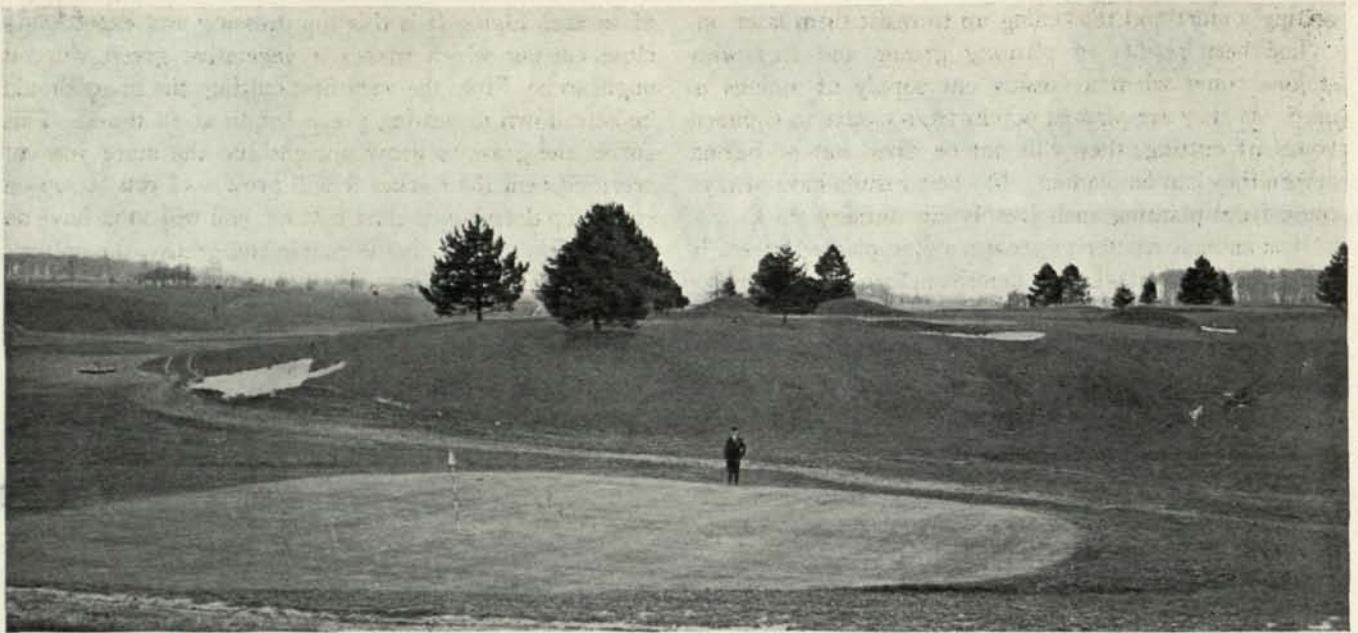
Lakemont Golf Club, Reno, Ohio; Catawba Cliffs Club, Port Clinton, Ohio; Defiance Golf Club, Defiance, Ohio; Mohawk Golf Club, Tiffin, Ohio.

### *Train Future Greenkeepers*

During the years of my career as a greenkeeper, I have followed the policy of training the boys under me so that they are capable of handling a course of their own in due course of time. One of my boys is now greenkeeper at Pebble Beach, California, Mr. Joe Mayo. Mr. Al Schardt, who worked with me for some years now handles the Waneke Golf Club course at Buffalo, New York. Just last year another, Mr. Charles Meyers, took charge of the new Heather Downs course here in Toledo. This policy I believe is an excellent one for any green-



The Twelfth Green at Inverness Club, Toledo, Ohio



*The Rolling Beauty of Inverness Club Course at Toledo, Ohio. Taken with Number Fifteen in Foreground. Mr. S. P. Jermain, Life President Toledo Golf Association, Standing By*

keeper to follow. Every man looks forward to future success, and the right kind of a greenkeeper makes it possible through careful instruction of his men, to perfect them in greenkeeping that in the end they may take over courses of their own.

There is a lot of discussion about vegetatively planted bent greens, whether or not they are successful, and if not, why. It happens that I became interested in bent in the days when little was known about it, and I have grown it ever since. I keep a turf garden in shape all the time, and a large plat in condition for patching greens and tees.

#### *Weeds Will Grow in Bent if Not Checked*

When I read something to the effect that creeping bent greens grow so thick that they crowd the weeds out, I wonder if we are not getting a lot of misinformation on this particular subject. Since 1921 I have grown vegetative bent, and I make no claim that weeds will not grow in stolon planted turf. It is true that weeds do not get an easy start in old bent turf, but what about newly planted greens?

Until turf planted by the stolon method becomes well established, weeds will creep in at the start, and if not promptly taken out will cause a lot of trouble and plenty of work. Therefore, keep them out while the turf is



*Number Ten at Inverness, with Number One at Right. Both Greens are Well Guarded by the Brook and Require a Well Played Pitch*

getting a start and thickening up to resist them later on.

The best results in planting greens and tees with stolons come when a freshly cut supply of stolons is used. If they are planted within from twelve to eighteen hours of cutting, they will not be dried out or heated before they can be planted. My best results have always come from planting such freshly cut nursery stock.

It is an easy matter to grow a stolon planted green, if you are content to wait six months before it is in playing condition. You can neglect a new green considerably and still get results in six months, but—

#### *In Play Eight Weeks From Planting*

A first class putting green can be grown in not to exceed eight weeks, if planted with fresh stolons, top dressed not too heavily at first, but frequently thereafter, kept well watered, and weeds removed as soon as they start. This also entails proper rolling, and the mowing started just as soon as the grass plants are three quarters

of an inch high. It is this top dressing and exceedingly close cutting which makes a vegetative green what it ought to be. From the very first cutting, the grass should be kept down to putting green length at all times. This forces the grass to grow upright and the more you cut creeping bent the thicker it will grow. If you let up on either top dressing or close cutting, you will soon have on your hands a green that is coarse and grainy, the golfer's pet aversion, and the mark of a poorly informed greenkeeper.

If every vegetatively planted putting green is painstakingly weeded while the turf is new, and occasional weeds thereafter promptly removed; if the turf is frequently top dressed to keep the runners covered, and if kept cut closely during every day of the growing period, no golfer will find fault with such a playing surface. Neither will the club officials have any quarrel with the greenkeeper as to the cost of maintaining bent greens.

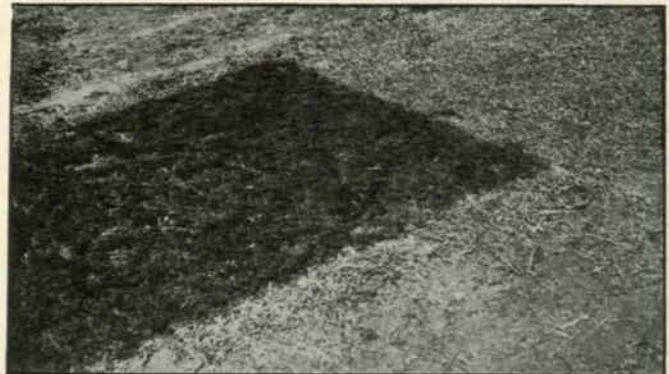
## *New Grass For Southern Greens*

### *Poa Bulbosa, Grown From Bulbs*

MUCH progress in the culture of suitable grasses for golf turf has been made in the last ten years. From seed to stolons, and now to bulbs. Lyman Carrier, formerly connected with the U. S. G. A. Green Section at Washington, was largely responsible for introducing to Northern courses the vegetative method of planting creeping bent. During the past few years he has been investigating a new grass which will undoubtedly help to solve the problems of winter turf in the South. This grass is propagated from a very small bulb, almost as small as a grain of wheat, and it is known as *Poa Bulbosa*.

*Poa Bulbosa* was originally identified on the Capitol grounds at Richmond, Virginia, and is not yet listed in American botanies. It is a native of Europe, and so far as known is the only true grass which grows from bulbs.

During the summer months it is dormant, but given plenty of water in the fall, the bulbs revive and start growth. It is recommended to plant from three to five pounds of bulbs per thousand square feet of area, and when planted in Bermuda turf, it is not necessary to make any other preparation than that of cutting the Bermuda down close, and raking the surface lightly. After scattering the bulbs, the surface should be kept watered thoroughly for two or three weeks. This grass should not be planted except in the fall or winter, and combined with Bermuda should furnish an all-year-around putting surface. It is dormant at the time Bermuda is at its best, and when Bermuda greens turn brown in the late fall, *Poa Bulbosa* comes to the rescue with fresh green growth. Each bulb produces a single



*Dark patch shows Poa Bulbosa planted in Bermuda Turf*

grass plant, from which a dozen or more tillers or new plants grow at the base. Each of these young plants will produce a bulb to tide it over the coming summer, to start new growth when called upon the following winter.

Greenkeepers who are maintaining Bermuda grass in Southern states should experiment under their own conditions with this new grass, and report to the office of the National Association of Greenkeepers of America, 407 Caxton Building, Cleveland, Ohio. Anywhere south of the Mason & Dixon line there is yet time to get results from a planting. It is suggested that sowing five hundred or a thousand square feet of Bermuda sod with *Poa Bulbosa* bulbs will afford an opportunity to determine the value of this new discovery for Southern putting greens.

*Information received by courtesy Stump & Walter Company, New York.*

# Are Your Rollers Ready?

IT is very important that the fairways be rolled in the spring at exactly the right time. There is no hard and fast rule that can be laid down as to just when this time arrives for the reason that it depends so much on the season and the weather conditions. Therefore the proper time must be determined by the greenkeeper or the one in charge of the course, who must make this decision based upon his experience and the conditions encountered.

First and foremost, fairways should not be rolled until it is reasonably certain that there will be no further freezing weather. They should not be rolled until the ground is dried out sufficiently so that the roller will not unduly pack the surface soil and thereby create a condition that makes it difficult for the roots of the turf to properly function and thrive.

## *Never Roll Soaked Clay Ground*

It will be found on many courses that certain fairways can be rolled much sooner than others and the schedule of rolling should be worked out ahead of time based upon experience of previous years or from careful observation of the existing conditions, which will be pretty clearly determined as soon as the frost is out of the ground. Those fairways which are the first to become firm under foot should be rolled previous to those that remain in a soaked condition, and then the schedule so set up that it will take the different fairways in rotation as they arrive at a condition that is proper for spring rolling. This refers particularly to courses where the soil is of a clay nature.

Where the course is built on sandy soil, rolling can be handled any time after the frost is out of the ground,

and in some cases it may be wise to roll the course several times during the season, choosing times that follow right after rains.

## *Fill In Low Places*

It is unwise to attempt to level out a fairway by means of rolling. By this is meant, a fairway so uneven or bumpy that it would require very heavy and continuous rolling to bring the surface down to a common level. This procedure is sure to cause future trouble, due to the fact that it unduly packs the high spots, which means that the grass on these spots will gradually die out, leaving bare and unsightly patches. If the fairways are very bumpy or uneven it is much wiser to use a reasonably heavy topdressing that will fill in the low spots, rather than to attempt to roll down the high ones.

## *Rolling Greens and Tees*

The question of rolling greens and tees involves almost the same conditions that have to be considered in rolling fairways and the same careful observation in order to determine the proper time is necessary.

The greens and tees as fast as they arrive at a condition that is proper for rolling should be rolled with a reasonably heavy hand roller. After this first rolling they should continue to be rolled with a light putting green roller, preferably of the four-section type. Precaution should be taken to see that the green is never rolled when it is wet. In rolling greens and tees the proper procedure is to roll in both directions, as this insures to a large degree the roller coming in contact with every undulation on the surface.

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# Winter Killed Golf Turf

THE one and only cure for "winter kill" is to prevent it by making sure that the greens, tees and fairways are surface drained. If the green or fairway is already built and is not surface drained, the easiest way to avoid winter kill is to immediately provide surface drainage. Of course there may be isolated cases where this procedure would be impossible, and in these special cases drainage should be provided that will adequately carry off the water.

The great trouble with all drainage systems that work perfectly in summer, is that once frost gets into the ground it is impossible for water lying on the surface to

get through to the drain tile. Therefore the water lies accumulated on the surface, and when spring comes leaves bare and unsightly places on the green.

Where cases of winter kill are encountered, the surest and quickest method for the treatment of these spots is to take sod from a nursery if available, and returf the spots, after first making sure that the contour of the surface has been changed so that in the future surface drainage will be insured. If impossible to change the contour of the green, then under drainage must be provided, and the surface either seeded, planted vegetatively with creeping bent stolons, or sodded.



## Month by Month With the Trees

By C. M. SCHERER

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



Editor's note: Almost every greenkeeper has trees to take care of and loses a certain number every year. That's why we have enlisted the aid of Mr. Scherer, a nationally noted tree doctor, to tell us what happens to the trees through all seasons of the year. It's a precious work, saving trees, and we believe the greenkeepers of America will appreciate Mr. Scherer's contribution to our worthy cause.

SOME forty-five years ago, the thrifty grape growers in the neighborhood of Bordeaux, France conceived the idea of sprinkling copper sulphate, quite commonly known as blue vitriol, on their grapes. This practice was begun to prevent vandals from stealing the grapes along the roadway. Only the vines immediately bordering the roads were so treated.

When harvest time came the growers found that the copper sulphate had not only prevented people from stealing the grapes, but had prevented the dread "mildew" from doing its accustomed damage. When they had accidentally found that the copper sulphate had this marked effect on the ravages of the mildew, they started treating their whole vineyards with the copper preparation, and thus was born the practice of spraying now used for the prevention of insect pests and fungous diseases.

Ordinarily, shade trees require two sprays each year in order to assure reasonable freedom from insect pests and fungous diseases. One of these sprays is applied before the leaves appear in the spring and is commonly known as the dormant spray. The second spray is applied as soon as the leaves are full grown and is normally known as the leaf spray.

### *Early Spraying Controls Scale Insects*

The dormant spray is usually an oil preparation of some kind, although orchardists very often use lime sulphur for controlling certain pests. The dormant spray is particularly effective against scale insects. Oftentimes it controls the red spider, because the eggs of this pest are destroyed. Some aphid or plant lice eggs are destroyed at the same time, but not enough of them to insure against depredations of these insects

later in the season. Frequently, certain fungous diseases are controlled but in the case of shade trees these are quite often unimportant and little effort is expended to secure this result. With the orchardist, the problems are different and many times the control of a fungus has to be definitely considered when a dormant spray is applied.

The scale insects, which are controlled by the dormant spray, are very pernicious and destructive of both shade and orchard trees. They collect in large numbers on the tender portions of the tree, such as the young twigs and the new bark on the older branches and trunks. Here they settle themselves, insert their bills into the succulent tissues and start extracting the very life giving juices from the plant. As soon as this habit or mode of living has been established, they secrete a protective covering for themselves. This covering is made of a kind of wax and is so constructed that the scale insects living beneath the wax shields are pretty thoroughly protected from outside influences. It is impossible to hit them with the ordinary contact spray such as nicotine, which is used to kill unprotected sucking insects like mealy bugs and plant lice. Arsenate of lead, which is used to poison leaf eaters, is ineffective against the scale insects because they suck their food and cannot be poisoned. It is, therefore, necessary to use some material such as a miscible oil, which will first destroy the covering and then kill the insect. One of the best known oil sprays, which will accomplish this purpose, is known on the market as "Scalecide." Another one is an oil manufactured by the Sun Oil Company and is known as "Sunoco." Lime sulphur will to a certain extent accomplish the same results, but under certain conditions it is inadvisable to use it because, if it comes in contact with lead paint on surrounding buildings, the paint is badly spotted and the buildings have to be repainted.

Because the oils and lime sulphur have to be used at rather strong concentration to kill the scale, they must be applied when the tender portions of the tree, such as

the leaves and young growing twigs, are protected, and it is this necessity which requires spraying for scale insects during the dormant season. The Scalecide and other oils are usually diluted about one gallon of the commercial oil to fifteen gallons of water, and then sprayed thoroughly over the trees. The lime sulphur is ordinarily diluted one gallon of the commercial product with eight to ten gallons of water, and then applied as is the oil.

The killing of the eggs of red spider and some of the plant lice eggs is just a favorable coincidence, because almost invariably the dormant spray is applied primarily for the control of scale and little else.

#### *Attacks on Trees in Full Leaf*

When the leaves have reached their full size, it is necessary to protect them from the leaf-eating and leaf-sucking insects and occasionally from leaf-destroying fungi. The leaf-sucking insects are, of course, the so-called plant lice or aphids. They can be killed by hitting them with tobacco spray. The leaf-chewing insects include such pests as the canker worm or, as it is sometimes called, the measuring worm; the tussock moth caterpillar; elm leaf beetle; and various others which are similar to these in their habits. Since these various pests chew and eat portions of the leaf, it is possible to poison them by covering the leaf surfaces with arsenate of lead. After this is done, it is impossible for the insect to eat any portion of the leaf without getting into its system some of the poison and then, of course, the insect dies and its days of destruction are at an end. In the case of fungous diseases, it is necessary to cover the

leaf with some protective coating which will prevent the disease from getting started. Ordinarily, copper sulphate together with lime, or sulphur in some form, is used. The sulphur or copper remains on the surface of the leaf and then, when there is sufficient moisture in the form of dew or rain for the fungous spores to start growing, a little of the copper or sulphur is dissolved in the water and as the fungous spore germinates it is killed by this solution. Consequently, the fungus cannot get into the leaf to cause the diseased condition.

#### *A Three-In-One Control*

Fortunately, it is not necessary to apply each one of these various leaf spray materials by itself. All of them can be combined into one spray. For instance, an owner desiring to control in his leaf spray three pests,—aphids, canker worms and some leaf disease such as the blotch of horse-chestnut trees which is so common. Instead of having to make three separate sprays; one to apply the nicotine, one to apply the arsenate of lead, and one to apply the sulphur mixture, he combines all of these materials into one spray. He can use a one hundred gallon tank and put into this tank one pint of nicotine sulphate, which is known on the market as Black Leaf "40"; four pounds of powdered arsenate of lead; and two and one half gallons of liquid lime sulphur together with enough water to fill the tank. This makes up a combination spray which will kill the aphids, poison the canker worms, and prevent the horse-chestnut leaf blotch fungus from getting a start.

Since many of the insect pests and fungous diseases



*Large tank truck in use applying dormant spray before trees are in leaf. This equipment makes quick work of spraying trees on golf courses, public parks and large estates*



start their work at the same time that leaves reach full size, it is possible by this spraying program to prevent them getting a start and, by so doing, have the trees reasonably free from insect and fungous pests during the remainder of the growing season. However, in certain cases, this one spraying is not sufficient to protect over a long period of time and unless subsequent sprays are given, considerable damage may be done and the benefit of the original spraying lost.

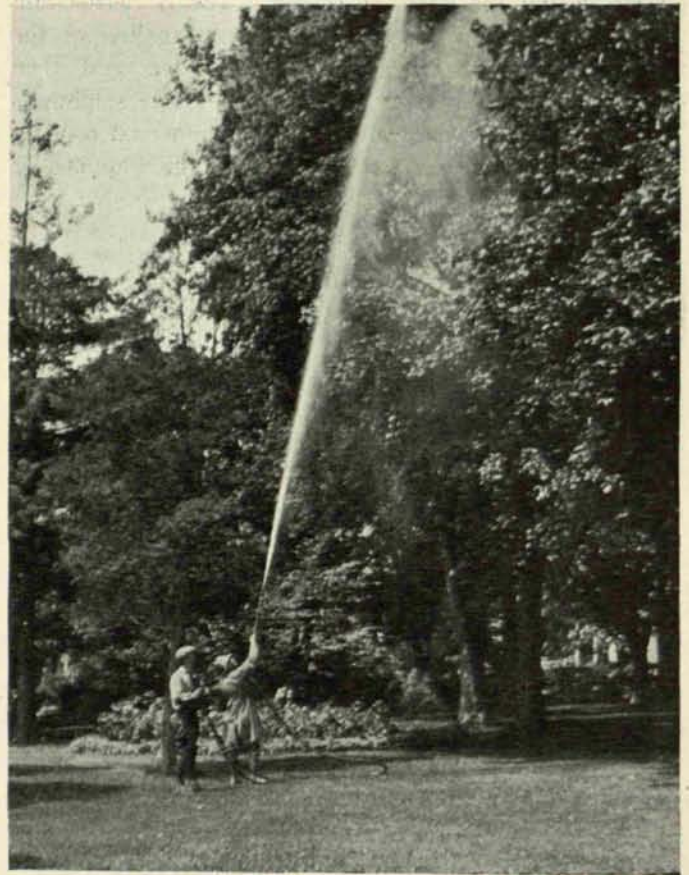
Not always is it necessary to include a fungicide, such as copper and lime or sulphur, in a spray mixture. Some trees are seldom attacked by fungous diseases and, when this is true, one need make no preparation for preventing them. Under such conditions, the arsenate of lead and the Black Leaf "40" may be applied to control the insects alone.

#### *Have Fungous Diseases Diagnosed*

At the same time, some trees have fungous diseases which start at other times than those indicated in the preceding paragraphs, and under such conditions it is necessary to apply special sprays for preventing these fungous diseases. Since a lot of time, money and energy can be wasted in spraying improperly, it is always best under unusual circumstances to get the advice of someone versed in spraying so that the expenditures may be made most effectively.

Spraying must be done thoroughly in order to secure the results desired. I know of few operations which can be more dismal failures than spraying which is done either ignorantly or carelessly. It is always well to seek reliable advice and then follow that advice in spraying

problems. By so doing the freedom of the trees from insect and fungous pests can be reasonably assured.



*A special spray nozzle in action reaching to the top of high trees. Applying the three-in-one mixture described on preceding page for control of blight, aphids and canker worms*

## *Vegetative vs. Seeded Greens*

By MACK BURKE

Greenkeeper, Scioto Country Club, Columbus, Ohio

**A**NY discussion of this topic involves in an argumentative way a consideration of bent grass versus the other fine turf grasses suitable for putting greens.

#### *Comparing Turf Characteristics*

The characteristics of bent are, briefly: aggressive, rapid, spreading growth under anything like favorable conditions, which in itself removes one of the greatest detriments to a good putting surface, namely weeds; giving playable sward at a reasonably early date after planting, which constantly improves with no further planting; development of fine turf in one season, which makes an even fine mat of fine putting quality, homogeneous texture and color. In addition, bent is dependable and self-healing.

In the case of Redtop, fescue, and other grasses which are usually planted in seeded greens, constant weeding, occasional re-seeding, and expert attention will make of them very suitable putting greens.

The characteristics of the resultant turfs would seem to favor bent, if characteristics are to be considered alone. If other items are to have our consideration, we are immediately involved in the progress between the planting period and the time the turf is matured. To investigate these items, let us scan the processes separately.

#### *Preparations for Planting*

The preparation of the soil can, and should be, practically the same, with the exception that bent stolons can be planted when the soil is in a wet condition; whereas the sowing of grass seed is better accomplished when the seed is raked into dry, powdered soil, since seed is more evenly covered under dry conditions and the germination is more uniform.

#### *Getting Bent Ready for the Mower*

After the soil is prepared, bent stolons should be cut into pieces something over an inch in length and lightly



Open Championship 1926 at Scioto Country Club, Columbus, Ohio. Joe Turnesa, playing from behind bunker at final hole afternoon round

but evenly spread over the surface, approximately one-tenth as thick in quantity of stolons as the nursery stock grows per square foot in good soil and favorable climatic conditions. A sufficient quantity should be allowed to insure at least one joint or node to each square inch of surface. This planting is covered by hand, unless some practical mechanical means are used, to a depth of one-eighth of an inch, depending upon the texture of the soil, available moisture, etc. After the stolons have been rolled as flatly as possible, the top soil cover is applied and rolled to press the soil firmly about the nodes. The green is then kept moist by means of a fine spray which prevents washing, for a period of several days. Stolon plantings should never be allowed to become dry at this stage. A few weeks of growth, if fall planting is done, will result in a well covered green, with the new root stocks commencing to spread, when the cold weather sets in. If late spring or early summer planting is done, the grass will rapidly spread into a luxuriant tangle of rugged matted grass blades and runners.

#### *Bringing Bent into Play*

After these stolons have started to tie down, or re-root, and after judicious rolling, the grass should be cut. Not too closely, but close enough to allow a good top-dressing to cover the stalky runners and yet not smother the grass blades. From this time on, continuous cutting at regular periods, and two or three top dressings rapidly smooth and polish the greens into putting form.

The usual processes of fertilizing, periodical treatments of Ammonium Sulphate, and careful watering will soon age the grass into turf. This top dressing, fertilization, watering and rolling is comparable to that done in the care of seeded greens. The big difference lies in the seeding, which after the first cutting is practically nil.

#### *From Seed to Putting Turf*

In discussing the seeding method of producing turf, the amount of seed to use for a given area, and the kinds of seed to use, depend upon local soil and climatic conditions to a certain extent. However, the soil preparation is the same as for planting stolons, and the seed should be thoroughly raked to cover, dry soil preferred, as before stated. Thereafter, the soil should at all times be kept moist but not wet, especially if the temperature is low.

From the time germination takes place, and the grass starts to grow, the usual care should be taken of the newly planted greens, namely, watering, fertilizing, rolling, top-dressing, etc., comparable with the care of bent turf, including constant periodical cutting.

The seeded greens should be carefully weeded then, and thereafter, in order to reduce the strangling of any of the seedlings. Herein lies the difference in the development cost and progress between seeded and vegetative putting greens.

Because there is a continuous seeding to weeds in putting greens which have been planted with grass seed, the weeds have a fine chance due to their rank growth, to usurp sunlight, food and moisture needed by the growing grass. In the case of bent grass, this is not so true, because the grass near to the weed growth is easily fed by its runners which reach out in several directions. Therefore the weed is the victim eventually, since it is constantly cut and can only secure nourishment from one root location.

#### *Why I Choose Bent*

The items to be considered in the discussion would then seem to be:

- First: Planting Costs
- Second: Development Costs
- Third: Development Time
- Fourth: Relative Results

Relative results have been discussed all over the country, and are now-a-days considered to be in favor of the bent grass.

Development time, which of course is an important item, particularly so when golf club members are aching to play and the greens are being re-planted, is in favor of the bent.

Development cost, due to the labor cost of weeding, favors bent.

Planting costs, however, favor seed, but this item is nowhere nearly as large as the development cost of a putting green, as in maintaining a seeded green the weeding cost soon mounts above the difference in cost of planting.

Wherever it is practical to follow the method of planting bent vegetatively, it is undoubtedly true that such a green more than pays for itself in the reduction in cost of maintenance and in the production of a really fine putting surface.