



Here is the quarter acre of plots, each 10 ft. by 10 ft., at Riverton, N. J., where considerable research with grubs has been, and is being, conducted.

## How to Handle Fairways in Battle with Grubs

By B. R. LEACH

**F**AIRWAYS are a necessary evil as far as the average golf club is concerned. You cannot do without them in the game of golf and yet even the cost of keeping them mowed is an important item in golf course maintenance. The attitude of green-committees and club officials in general toward fairways, and especially their attitude on the spending of money for fairway betterment or insurance, was made very clear to me in the early days of the difficulty with the Japanese beetle grub. At that time the greens on several clubs in the vicinity of Riverton were looking pretty seedy as a result of the grubs present in the turf. I gathered from the remarks of certain passing female golfers that it was entirely impossible to putt on the blankety-blank greens, that the green-keeper ought to be boiled in oil, and that the green-chairman was no gentleman. Not one word about the fairways, which to put it mildly were atrocious.

From what I have seen of the average golfer it would appear that his thoughts are centered on the greens. If these are first class, so that the ball stays put when

lifted onto the green with a niblick, and the putting can be accomplished with the usual aplomb, you will get only an occasional and half-hearted growl about the condition of the fairways. But let the greens go bad, regardless of why they went bad, and the club membership hits the ceiling.

It is not surprising, therefore, that the officials of the clubs mentioned above begged me to concentrate on saving the greens. As the president of one club said, "Our greens are in bad shape as a result of this grub. Unless we can get them back into shape very shortly we will lose a large proportion of our members and the club will be in a bad way financially."

Under the circumstances it is to be expected that the average green-committee will rarely wax enthusiastic on a proposal to spend much money on the fairways while they will invariably endorse any plan which promises to improve the greens. Aside from the relative importance of greens and fairways in the minds of officials and players, there is another reason for the general apathy toward fairway im-

provement and that is the item of expense. It doesn't cost so much, comparatively, to carry out a new scheme on the greens but to do the same thing on the fairways runs into real money. There are two or three acres of greens on the average 18-hole course as compared with 60-odd acres of fairway.

As a result, the fairways in the average golf course are more or less neglected and most of them show it plainly. They are mowed religiously and once in a great while some grass seed is scattered over them. As a matter of fact, you might as well throw the grass seed over a cliff for all the good it does.

While, therefore, the use of arsenate of lead as a means of grubproofing greens is constantly on the increase in all sections of the country, I do not expect to see its use extended so rapidly in connection with fairways. If my experience around Philadelphia is any criterion, I do not expect to see the average club grubproof its fairways until they are virtually ruined by grubs and the bare soil in danger of being washed into the nearest creek. That this is poor business is obvious when you consider that the 250 pounds of arsenate of lead necessary to grubproof an acre of fairway can be bought for about \$35, whereas if you delay the grubproofing until the fairways are ruined, you will not only have to spend this \$35 an acre but also at least an equivalent amount for grass seed.

### Hand-Spreading Impractical

When applying arsenate of lead to fairways, in view of the acreage involved, do not spread by hand; to do so will run up the labor cost to a prohibitive figure. It is much better to obtain the use of a first class lime or fertilizer spreader, one that covers an appreciable strip for each trip across the fairway and can be drawn by a tractor or horses. Unfortunately many of these machines are built and designed to deposit the material upon the turf in drills running parallel and spaced a few inches apart. This may be entirely permissible with lime or fertilizer but it will not prove satisfactory when spreading arsenate of lead. Therefore, when using a spreader of this type for fairway grubproofing, fix one or two baffle boards below the openings through which the material pours out from the box, arranging them on an angle so that the streams of arsenate hit them and are broken up before they reach the ground, resulting in an even spread all over the turf. It is also a good plan to

fasten some heavy burlap bags along the sides of the box, front and rear so as to prevent largely the tendency of the arsenate to blow about.

All these spreading machines have differently designed holding and feeding capacity but all are capable of being regulated so as to spread dry, evenly screened material with a remarkable degree of accuracy if a little care is taken. In regulating and adjusting the machine it is best to gauge the amount spread over a long, narrow area of turf rather than over a short, wide one necessitating many turns, and it is best to do the regulating with plain screened soil or sand containing no arsenate of lead. Remember in using these machines that the wheels extend out beyond the box and it is necessary to lap over the wheel marks somewhat so as to leave no untreated area.

After the arsenate has been distributed by machine, it is advisable to run a spike-toothed or diamond-pointed alfalfa harrow both ways across the turf so as to harrow in the arsenate of lead lightly without digging up the grass. Do this harrowing as soon as possible after the fairway is arsenated; there is less chance of surface soil-washing as a result of a heavy rain, with the consequent carrying of the arsenate into the low spots.

### Preparing Arsenate for Spreading

Do not spread the arsenate over the fairways without first mixing it with dry filler such as finely screened soil or sand—first, because 250 pounds of arsenate of lead is a relatively small bulk of material to be distributed evenly over an acre of ground, and second, because the material, a light fluffy powder, blows about at the slightest puff of wind. Hence it will be found advisable to mix the arsenate with a quantity of dry soil or sand, first to give added bulk so that the machine may function at its best and secondly because the arsenate will tend to cling to the particles of soil or sand and when the mixture strikes the turf it will filter down through the blades of grass and have decidedly less tendency to cling to them. The main idea when this job is completed is to have the arsenate *on the fairway*. The portion of the arsenate which blows over on the rough won't do a bit of good.

Filler for arsenate of lead when the mixture is to be spread by machinery should be dry; otherwise there will be endless trouble and uneven distribution due to clogging.

I am frequently asked regarding the feasibility of spraying the arsenate onto the greens and fairways, using a sprayer such as is employed for truck crops, and I understand that some greenkeepers are contemplating trying out this method. Personally, I do not consider the spraying of arsenate upon turf an advisable procedure. Grubproofing dosages are relatively heavy and the arsenate sprayed in this way will have a greater tendency to stick to the blades of grass; a pronounced burning may result.

In mixing dry soil or sand with arsenate of lead in preparation for spreading by machine brains must be used to a certain extent, even though that unusual procedure may cause undue mental exhaustion and pain. Do not throw the sand or soil in a pyramidal heap, throw the arsenate on the top of the heap, and then make a few half-hearted stabs at the pile with a shovel. Proceed, on the contrary, as follows: Spread out the dry soil or sand on a smooth, hard-surfaced floor, making the layer a few inches thick depending upon the amount of arsenate and soil you are mixing at one batch. Now spread the arsenate evenly over the layer of soil and using a scoop or flat shovel, dig into the composite layer of soil and lead arsenate, keeping the shovel in contact with the floor. Throw the shovelful in a heap at a convenient point on the floor, employing a twisting motion with the wrist so as to mix the arsenate and soil together as much as possible when the heterogeneous mass pours from the shovel. Take another shovelful in the same way and pour it *on top* of the first. Proceed and you will note that the pile assumes a cone shape and that each shovelful so added to the peak of the cone *runs down the sides of the cone*, resulting in a decided degree of mixing for the amount of labor expended. Continue until the layer on the floor has been entirely transferred to the pile. The mixing job is now half done. Now dig into the pile *from the bottom* with the shovel scraping the floor and throw the shovelful in a heap for the beginning of a new cone-shaped pile. Take each succeeding shovelful from the *bottom* of the old pile and throw it on the *top* of the new one. When you have built the second pile in this fashion, the soil and arsenate should be well mixed and in a condition suitable for the spreading machine. Incidentally, the individual doing the mixing will be in a general state of mental decrepitude.

## When to Grubproof Fairways

If grubs are present in the fairways and it appears that the latter are in danger of injury, apply the arsenate at once regardless of the season of the year, providing the ground is not frozen. If grubs are not present in the fairways but the latter are to be grubproofed as an insurance against grub attack, the material is best applied early in June, since the great bulk of egg-laying by beetles occurs after this period and the turf will then be in such a condition that the young grubs hatching from the eggs will be poisoned almost immediately by the arsenate in the soil.

## Maintaining Grubproof Fairways

Two hundred and fifty pounds of arsenate of lead should maintain a fairway in a grubproof condition for two years except possibly on slopes where there is a tendency for the surface soil to wash. After the first year, keep an eye on the turf for earthworm casts. If these become sufficiently numerous to be noticeable, it is an indication that the grubproof condition of the turf is becoming weakened and it is advisable to apply around 100 pounds of arsenate per acre in order to maintain the grubproof condition.

It is only fair to the reader to state at this point that my experience with fairway grubproofing only covers a period of two years, whereas I have been working with greens for six years. That arsenate of lead will grubproof fairways is an established fact, but how long a given amount of the chemical per acre will maintain the grubproof condition I cannot say. This can only be determined by the continued observation for some time to come of fairways arsenated during the past year or two.

Many greenkeepers, when planning to grubproof fairways as above, will raise the question as to whether they can mix and apply fertilizers with the arsenate of lead, all in one operation. The answer depends entirely upon just what fertilizers you propose to use. Rotted manure or mushroom soil, ammonium sulfate, synthetic urea, and such organic fertilizers as Milorganite, cottonseed meal, etc., are entirely permissible in this connection but I do not advise the use of ammonium phosphate, acid phosphate, the chloride or sulfate of potash or sodium nitrate. The latter series of compounds react with arsenate of lead and tend to lower its grubproofing properties, although the vigor of the grass is not affected thereby.