



Away With Worms

Control Measures to Keep Greens Right for Putting

By B. R. LEACH

ON occasions when earthworms are unusually numerous on a particular golf course or in an extensive section of the country, as was the case last year in the middle West, there is considerable conjecture among greenkeepers as to the reason for their undue numbers. In many cases the preponderance of the pest is laid to conditions which have absolutely no bearing on the question. It is quite generally believed among a certain proportion of the greenkeepers that organic fertilizers, such as cottonseed meal, tankage, etc., encourage the presence of earthworms and should be avoided for that reason. As explained in last month's GOLF-DOM, the earthworm feeds on partly decayed vegetable matter, such as dried blades of grass, etc., hence the presence of organic fertilizers would not directly stimulate the earthworm population. Such fertilizers, or for that matter, any chemical applied to turf, influences the earthworm population only as it

improves the texture of the soil and renders it more friable and suitable for the earthworms' development.

Under normal conditions earthworms do not breed well, or increase greatly in numbers during seasons of excessive rainfall, this being especially the case in heavy or poorly drained soils since this pest heartily dislikes excess water in the soil. Conversely it does not breed well or increase in numbers during dry seasons when the soil is dry and hard. At these times earthworms usually are down in the soil at a depth where the soil is moist. Under the circumstances a season of sufficient rainfall to maintain the soil in good friable shape will, other things being equal, result in an abundance of earthworms in the fairways and approaches, with the consequent invasion of the greens from the surrounding turf.

The earthworm population usually increases rapidly on any piece of ground after it has been properly drained. On the other



Proportioning machine in operation
using bichloride for control
of earthworms

hand, greens built on very sandy soil soon begin to support a fair earthworm population as soon as the greens are top-dressed with a mixture of soil and organic matter, especially if the soil used in the topdressing is heavier than the native sand. In both these cases the increase in worm population is due to the making of the soil more conducive to their well being; in the first instance by removing the excess soil water and in the second instance by making the soil more capable of retaining sufficient soil moisture so that it does not dry out rapidly.

As stated in last month's article the better the soil of your green is for the growth of turf the greater will be the earthworm population. Under the circumstances artificial control measures are necessary to hold them in check on the choicer portions of the course, such as the greens and approaches.

Extend Treatment

Before considering control measures it might be well to point out one fact which should always be borne in mind in connection with earthworm control and that is the fact that no matter how often you treat a green for earthworms they will nevertheless be constantly creeping into the green from the surrounding turf just outside the green proper. Consequently when you confine your earthworm treatments to the green *only* it is very improbable that your green will ever be entirely free from worm casts.

The system of stopping dead at the edge of the green when applying chemicals for earthworms is mighty poor business and false economy. Extend the application of the chemical for at least ten feet out beyond the edge of the green 15 or 20 feet is even better.

Another ill-advised attitude of many greenkeepers is their snap judgment on a worm killer or a job of worm killing based entirely on how many worms come up to the soil surface and turn up their toes within a short time after the chemical is applied. If you will just retire to a quiet, secluded corner for three minutes and do a little thinking you will realize that this method of judging a worm killer is abject bunk. When I am doing a job of worm eradication I don't give a damn if I never see a worm come up and croak. What I am interested in knowing is how many worm casts there will be on that green the second morning after I have ap-

plied the chemical. Dead men make no noise and believe me dead worms make no casts, and the *absence* of worm casts is the surest indication that the treatment has been successful.

Another point to bear in mind if success is to be obtained with the use of such worm eradicators as bichloride of mercury or mowrah meal; as stated previously the earthworm loathes dry soil and goes down to moist cool soil when the top soil is dry and baked. Consequently it is poor practice to treat soil in this condition for the control of worms because the liquid has to penetrate the soil to too great a depth before it reaches the worms. Keep the soil of a green in a moist but not wet condition for a week before the application of the chemical and the worms will be right up under the surface so that the chemical can flood the earthworm burrows and give you a first-class control. Failure to observe this important point is the cause of many failures in earthworm control. The chemical will do the work if you give it half a chance. Furthermore, grass which has been dry for several days is in a weakened condition and severe burning often results from treatment with bichloride under these conditions.

Control Measures

Mowrah Meal: This is a first-class earthworm killer, its principal value resting in the fact that it is pretty nearly foolproof and can be applied with very little fear of burning the turf. It is, however, a very expensive method of worm control inasmuch as the meal sells around ten cents a pound and 35 to 40 pounds are necessary for a thousand square feet of turf. It is scattered dry over the green and then watered thoroughly.

Bichloride of Mercury: As a worm killer this chemical is damned by some and praised by many. It is a first-class material if you use a little horse sense along with it. There are two methods of applying it to turf; first, in solution by means of sprinkling cans, barrel sprinklers, etc., and second, dry mixed with sand. In the latter case the mixture of bichloride and sand is scattered over the green and watered in with a hose. Either method is good provided you know your stuff. In using the dry method ten ounces of the bichloride is mixed with a sufficient bulk of sand to insure easy spreading and applied to a thousand square feet of turf. After treating the green, water the green

with a hose but do not run the water on the green in one spot until it floods. Instead, water the green as a whole, going over and over it so that it soaks in without flooding or running-off into the low spots.

The second method of applying bichloride to turf consists in dissolving the chemical in water and watering the green with the resulting solution. The accepted dosage consists of one ounce of bichloride to 30 gallons of water, the solution being applied at the rate of a quart to a square foot of turf. Bichloride does not dissolve readily in plain water hence it should be prepared for use as follows: dissolve eight ounces of ammonium chloride in one gallon of water and then add eight ounces of the bichloride and stir thoroughly until everything is dissolved. One pint of this stock solution will contain one ounce of bichloride and this is the amount to be added to 30 gallons of water for application to the green. Incidentally some greenkeepers use one ounce to a barrel of water and secure good results, hence the dosage is more or less up to the operator.

Don't Flood

In applying the solution to the turf do not make the mistake of flooding the green with the solution but rather apply it so it has a chance to soak in. Burning will result on many occasions when any portion of the green gets more than its share of the solution. Here is where low spots on the green, spots where there is little surface drainage, cause trouble in the application of worm eradicators. These spots get more than their share of the chemical, mainly due to the run-off from the higher portions of the green, and burning results in these dished-in depressions, no matter how much care is used in the application.

Properly Applying

Very few clubs have the apparatus for the job of properly applying bichloride in solution. The chemical is very hard on metal, hence it is poor business to use an expensive sprayer or proportioning machine. One enterprising firm, sensing this situation, manufactures a simple outfit for the application of bichloride solution to turf. It consists of a barrel mounted on wide-tired steel wheels. A pipe leads from the bottom of the barrel to another pipe which runs parallel to the ground, this latter pipe having holes every inch or so.

This machine is simply pulled up and down the green and the solution flows out through the pipe and is spread evenly over the turf. It is a very simple outfit, nothing to get out of order and should last for years. It impresses me as the answer for those who wish to apply bichloride solution. This same firm also supplies the bichloride in solution all ready to be mixed with water, a product which will often save the busy greenkeeper a lot of time and annoyance in procuring the ammonium chloride and in mixing the stock solution. Say what you will, it is often possible to be penny wise and pound foolish in buying the ingredients of an elaborate chemical mixture and then going to all the nerve-racking trouble of mixing them up with the limited equipment of the average tool shed. I have seen more than one man mix up bichloride and water in a tin bucket and then lose it all when the bichloride ate a hole thru the tin.

Where Compounder Serves

There are a few firms in the golf course supply business who manufacture first class mixtures of standard worm control chemicals and put them up in shape all ready for use with full directions on the can or glass bottle. I am strong for this sort of product just as I am strong for any other form of *service* which saves me time and annoyance. In this respect I am only one of a crowd, hence there will always be a sale of any proprietary turf remedy which is scientifically correct in formula and which is marketed in a form all ready for instant use.

There is plenty of room for improvement in the degree of cooperation between the so-called technical turf expert and the manufacturer of turf maintenance supplies. The former should quit knocking the latter while the latter should pay more attention to the findings of the former.

ARSENATE OF LEAD—This chemical is rapidly coming into use for the control of earthworms in fine turf. Inasmuch as I am the discoverer of this chemical as a grub, worm and weed control agent I will not go so far as to say that it is the best means of controlling earthworms. I will say, however, that those who have used the arsenate of lead method are not, as a rule, forsaking it for other methods.

The chemical owes its worm control-

ing properties to the fact that earthworms are constantly swallowing soil and when the latter is impregnated with the chemical the earthworms are killed. This means that a golf green which has been grubproofed with arsenate of lead according to the methods described in several of my articles which have appeared lately in GOLFDOM will rarely have a worm cast on them and especially so if the area immediately around the green proper has also been grubproofed.

Any earthworm which invades a grub proofed green is automatically killed as soon as it begins to take in a little soil during the course of its burrowing operations. There is nothing spectacular about the use of arsenate of lead as a worm control agent. It doesn't bring the worms up to the surface when you apply it, but nevertheless it is a sure way of keeping the turf free from the objectionable worm cast.

In the last analysis the greenkeeper can make his own choice of worm control methods. Bichloride or Mowrah meal will clean up what worms are present in the turf but they won't prevent reinfestation, hence they must be applied at frequent intervals in order to keep down the worm population. Arsenate of lead, on the other hand, is always there ready for business the moment an earthworm pokes its head on the green.

In next month's GOLFDOM will begin the discussion of the June Beetle and methods for its control.

Ralph Hoagland Represents Buchart-Nicholls

BUCHART-NICHOLLS, Glenbrook, Conn., makers of the BTN line of laminated bamboo-hickory shafted clubs, have appointed Ralph Hoagland, 71 East Wacker Drive, Chicago, as their mid-western representative.

Their Buchart-Nicholls line consists of 5 models of woods (driver, brassie and spoon) registered wood sets and regular and matched irons. Hoagland's territory includes the northern part of Indiana, Illinois, Wisconsin, Iowa, Kansas, Missouri and Minnesota.

A complete stock of clubs will enable the Chicago office to promptly fill professionals' orders.

Thanks for Help Like This— It's Valuable

M. R. VAIL, green-chairman of the Champlain Country club at St. Albans, Vt., has been kind enough to send GOLFDOM a copy of a letter addressed to the maker of a sewage disposal system. The letter reads:

We are after some information regarding sewage disposal for the club.

We have about 300 members but only on rare occasions do we have as many as 100 at the club at a time. The clubhouse closes about the middle of October and is not opened again until June 1 and there is no one at the club evenings. We have fine drainage on account of the hilly country.

Last season we opened a club restaurant and served about 2,000 meals with a possibility of the number of meals increasing considerably this year.

At present we are using a cesspool which has worked very satisfactorily for 9 years but, with a restaurant hitched on, the writer is fearful that the old, antiquated method will soon give us trouble.

Will you please furnish further information and quote prices on a septic tank equipment to take care of our problem. Also figure on separate equipment for greenkeeper's house which is situated at a considerable distance from the clubhouse. Greenkeeper's house takes care of four people in the family.

Why don't you people advertise in GOLFDOM so that we poor overworked club officials might find you without so much loss of time?

This is the co-operation that is helping us make GOLFDOM achieve its ambition. In the golf field the buying guidance of advertising in a business publication is of definitely practical value. Manufacturers do well to take cognizance of this fact in preparing their copy.

Co-operation like this extended by Mr. Vail helps us greatly in getting the advertising we must get to stand the gaff. We'll appreciate all this sort of team-work we can get. Send us a carbon of your letter to GOLFDOM advertising prospects and reap your reward in this world and the next.