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## Sod Webworms — A New Pest

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**T**HE wholesale destruction of turf by sod webworms this summer is the most severe on record. Lawns, fairways, greens and tees, football fields—in fact, turf of any sort gradually failed in the area occupied by the outbreak and at first was mistaken for the effects of drouth. Indeed, some greenkeepers were severely criticized by their Green committee chairmen for what the committee thought to be carelessness in watering. It seemed that the best, and heaviest turf suffered most severely. In golf courses, the aprons and approaches to the greens were first to show damage.

Complete data is not at hand concerning the extent of the outbreak, but the writer knows definitely that Ohio, Kentucky, Indiana, and parts of Pennsylvania and Illinois were included. In all probability, the area infested was more extensive than indicated.

The sod webworm is an active caterpillar, which, when full grown, measures about an inch in length. It is found, not by removing a plug of turf as is done in seeking for white grub larva, but by separating the grass with one's fingers. The most likely place to look is at the edges of patches that have turned brown. Upon separating the grass, the first "sign" may be masses of pellets or castings, then perhaps a web-lined furrow on the surface of the soil, with occasional burrows ex-

tending generally about an inch into the earth.

When the larva is exposed, it quickly seeks shelter and is observed to move rapidly either forward or backward. It is dirty gray in color with regularly spaced brown spots.

When the caterpillar becomes full grown it constructs a silken cocoon, to the outside of which there

adheres earth and trash. As a rule, it is found in a shallow burrow. In this cocoon the larva transforms into a brown, shiny pupa, and from the pupa, a little later, a moth emerges. When at rest, the moth folds its wings closely about its body and thus merits the name of the group to which it belongs, the Close-Winged Moths.

The moths fly at night and deposit their eggs in the grass for a new brood of worms. There are at least two broods per season and probably more.

The larva cuts off the stems of the grass, and the portion of the top which is not eaten dries and turns brown. The roots suffer but little direct injury but, of

course, the destruction of the grass tops affects the plant adversely.

It must not be understood, however, that the insect under discussion is solely responsible for the condition of the turf this year, since the drouth unquestionably has served as a contributing factor. This effect has been both direct and indirect. The



J. S. HOUSER

*Whose investigations of the sod webworm  
should be of great value to those interested  
in turf culture.*

direct effect is obvious; indirectly, the influence of the drouth has been felt in that it has favored the insects by rendering the larva less susceptible to attack by fungus and bacterial diseases which ordinarily play an important role in serving as natural checks against the sod webworm. Incidentally, it may be mentioned at the time of this writing, August 15, considerable numbers of larva are being found which have been killed by tiny wasp-like parasites.

#### INFESTED TURF ATTRACTIVE TO BIRDS

A SECONDARY effect following the scourge of sod webworms is the destruction of turf wrought by birds in the process of feeding on the insects. Robins do not disturb the turf to the extent that grackles and English starlings do. The starlings in particular have the pernicious habit of pulling up



CLOSE-UP VIEW OF SOD WEBWORM

*The worm is exposed by pulling away grass. Note debris-covered webs above worms.*

large pieces of turf, as is seen in the accompanying illustration.

Aside from the birds mentioned others were observed at work although they were less active.

The question has been raised by some greenkeepers whether the birds should be discouraged. The consensus of opinion of those with whom I have discussed the matter is that while the birds unquestionably disturb the turf, the killing of the insects more than compensates for the damage done. We cannot help wishing, however, that the starlings

and grackles were as genteel in their table manners as are the robins.

The number of birds flocking to some courses was almost beyond belief. On the morning of August 10th, a flock of at least a thousand starlings was observed at work on the greens and fairways of the Riceland course near Orrville, O. On another occasion, a flock of about four hundred robins was seen feeding on the lawn of the Experiment Station.

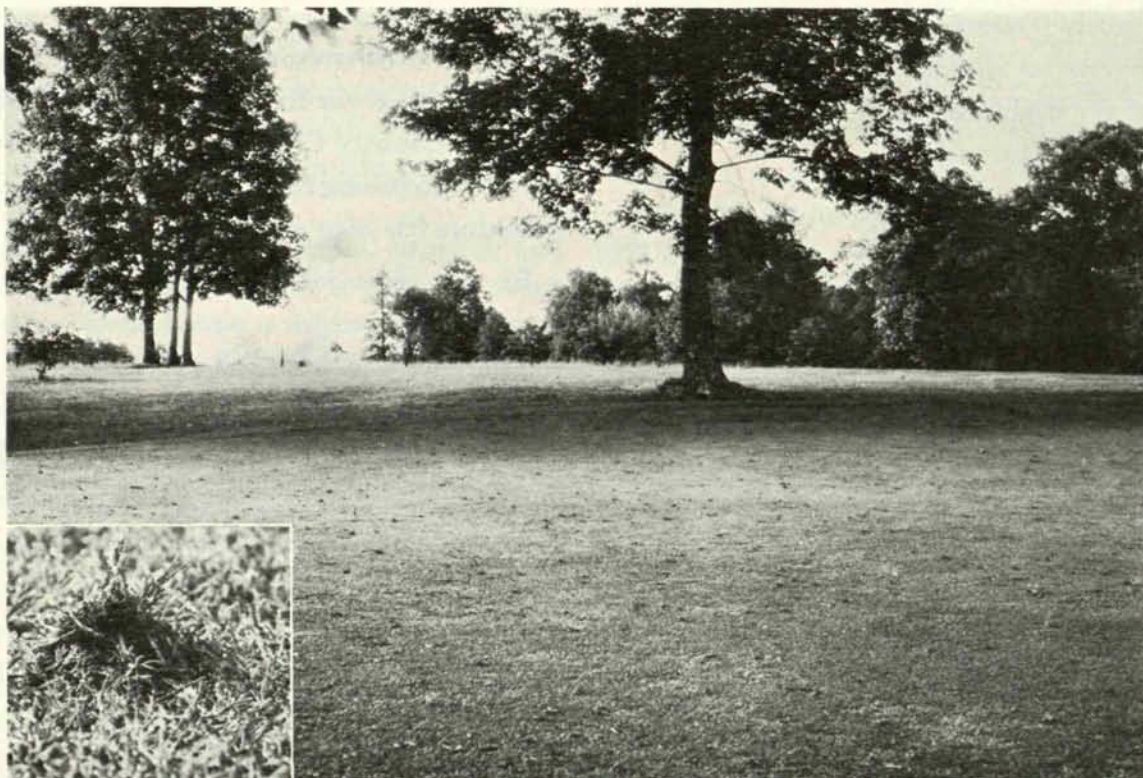
Some birds appear to be less active after an area has been given the arsenate of lead treatment, than do others. I counted two hundred and eighteen bird punctures, evidently made by starlings, in fifty square feet of space in a green at the Wooster Country Club on the morning after the lead treatment had been applied twelve hours before. It is surmised that the initial effect of the treatment in some way rendered the insects more easily detected in the treated area by the birds, since only forty-eight punctures were observed in an adjoining untreated area of similar size. In a day or two, however, conditions were reversed, and but little bird activity occurred on the treated plot while the untreated plot was severely torn up.

#### WHEN THE OUTBREAK ORIGINATED

PRESUMABLY the sod webworms are native insects and are present at all times in small numbers. When the numbers are small the damage is not noticeable. Under normal conditions, as with many other native insects, natural controls such as parasites, disease, predacious insects and other enemies, maintain a balance of population.

When conditions become more favorable for the pest and perhaps less favorable for the natural agencies of control, the pest increases with great rapidity. The most plausible theory for the present sod webworm scourge is that the drouth of 1930 favored the insect and was adverse to its natural fungus and bacterial diseases, thus enabling it to build up a heavy population.

The mild winter of 1930-31 favored the pest still further, and as a combined result of all these factors it was very populous this past spring. Regardless of the causes, however, it is definitely known that early in the summer a very heavy flight of moths occurred. The moths are strongly attracted to lights and when the moth-flight was on in full force, the insects were so abundant on the



INJURY TO GREEN BY ENGLISH STARLINGS

*Insert shows an example of injury nearly natural size.*



VIEW OF THE APRON AND GREEN SHOWING WORK OF SOD WEBWORM

*This photo was taken on Green No. 8 at the Wooster Country Club. The dark areas indicate living turf and light areas where injury has occurred. Note damage extending from apron into green, also small injured spots in the green itself.*

outside of windows of strongly-lighted rooms that it was scarcely possible to touch the glass without coming in contact with the insects. This condition was most noticeable where the lighted buildings were surrounded by turf.

#### THE DEVELOPMENT OF CONTROL MEASURES

WHEN the sod webworms were first observed at work on the bent-grass plots of the Ohio Agricultural Experiment station, one of the treatments applied by Messrs. Filinger and Herr of the Department of Entomology, was arsenate of lead. The response of the grass was so gratifying that soon thereafter a more elaborate series of plots was laid out at the Experiment station, in which arsenate of lead was used at different strengths as were also treatments of some other materials.

Meantime we were informed that the injury was becoming serious on the course at the Wooster Country Club and a cooperative project was started with the greenkeeper, M. M. Parsons. The success attained in saving the greens of this club was due in large measure to Mr. Parsons' sympathetic, vigorous attitude.

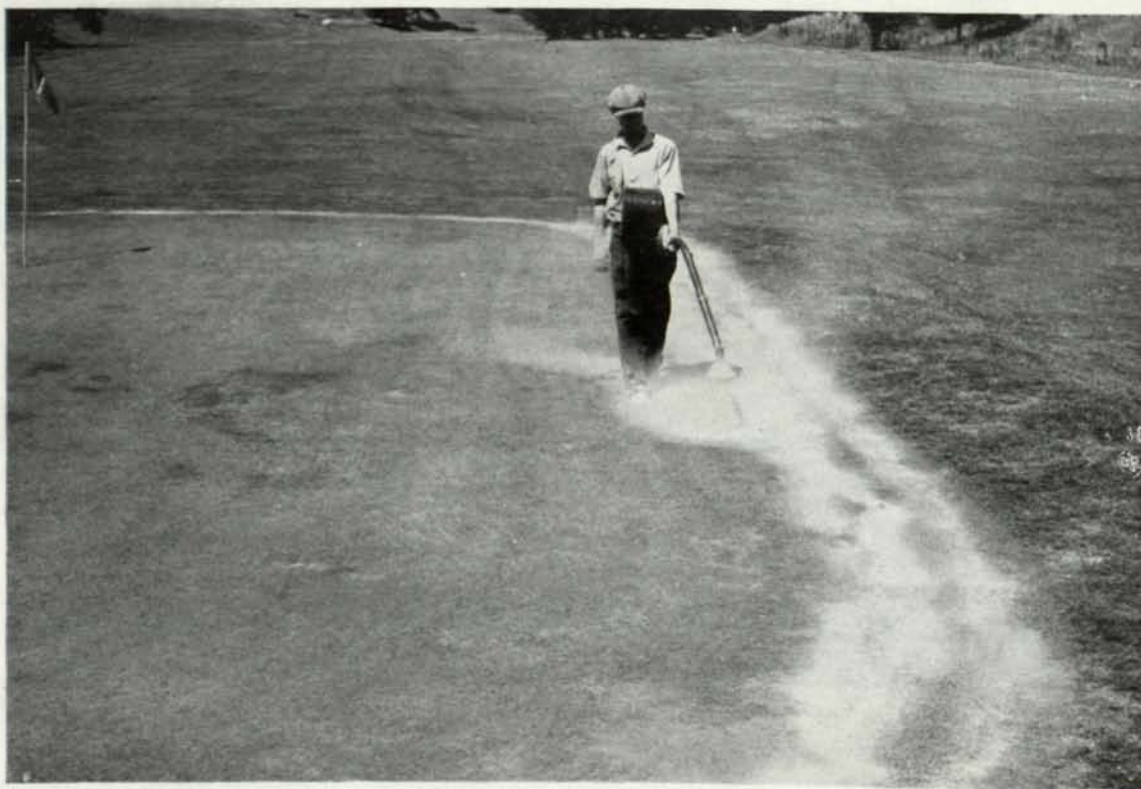
#### TREATING THE TURF WITH ARSENATE OF LEAD

OF THE materials used in our experimental work to date, both at the Experiment Station and at the Wooster Country Club, arsenate of lead has given the most promising results. As a rule, the following procedure has been employed:

By way of preparation for the work the greens were not watered for a period of 24 to 36 hours, and the grass was clipped close. The arsenate of lead was applied as evenly as possible with a hand-power duster at the rate of three-fourths of a pound to one hundred square feet of surface. It is important that the wind is not blowing when the dusting is done and also that the grass is not wet from rain or dew.

After the lead has been distributed by the duster, the green is then swept, preferably with a large floor brush, in order to further equalize the distribution of the powder and to brush it from the leaves, whereupon it lodges around the grass stems and near the surface of the soil.

The next step in order is to thoroughly water in the lead. In our experience this has been accomplished most satisfactorily by a coarse, driving



APPLYING ARSENATE OF LEAD WITH A ROTATING FAN DUSTER  
*This work must be done when there is little wind blowing.*

spray directed by hand from a hose. Sprinkling the green with a mechanical sprinkler device does not seem to obtain the effect desired since the gentle wetting at the beginning of the process tends to set the lead on the upper portions of the grass and does not deposit it on the parts upon which the insects feed.

After the lead has been applied, brushed, and watered in, it seems advisable not to water for about 48 hours in order to give the webworms an opportunity to fully feed on the poisoned grass.

While the foregoing procedure was the one most commonly used in our work, one green was treated by applying the arsenate of lead with a top dressing of soil. In this instance the lead was mixed with the soil, applied evenly to the surface of the green, and watered in. Up to this time the results obtained, if expressed in the recovery of the greens, has been very gratifying.

All of the greens of the Wooster Country Club were treated and in every instance a remarkable recovery has taken place. Indeed, insofar as sod webworm injury is concerned, the greens are now in almost perfect condition; whereas those familiar with the situation at the time the outbreak started fully believe that had no work been done the damage wrought would have been very serious. Except

in the case of one green which was suffering from a mild attack of brown patch at the time the lead was applied, no injury whatever from the application was observed on the course. In this one green the injury directly following the treatment was very slight.

The fact that injury did not occur on any other part of the course seems significant to us since on a few of the greens the application was somewhat heavier than that designated, and we are disposed to believe that arsenate of lead may be used safely if applied in the manner described. Moreover, the greens show a marked improvement in color, a common experience following applications of arsenate of lead. We also note that at this time the birds rarely visit the greens but confine their activities to the fairways.

Our plots at the Experiment station are located on newly-established blue grass sod, and, while the response has been very satisfactory, the effect is not as pronounced as it otherwise would have been had water been available for sprinkling during the period of drouth which followed the treatment.

The work to date we consider of a preliminary character, and further work, as the opportunity presents itself, may result in the development of a modification of the control suggested at this time,



WATERING IN THE ARSENATE OF LEAD AFTER IT HAS BEEN APPLIED AND BRUSHED IN  
*A hard-driving spray is best. Do not use the regular sprinkling system for this purpose.*

either in the quantity of lead to be applied or even in the substitution of some other insecticide for the purpose. This article, therefore, is presented more in the nature of a progress report than an account of the results of a completed project.

However, the results obtained have not been evaluated by the writer alone, since on August 7th the greenkeepers of Northern Ohio met at the Wooster Country Club for the purpose of studying the experimental work under way, and all in attendance seemed fully convinced that the degree of control obtained was eminently satisfactory.

It is hoped that the fact set forth may be of service to greenkeepers in the event the damage continues this season or that the insect is troublesome again next year. At the time this article is being written, a brood of moths is abroad, evidently depositing eggs for another generation of worms, but how numerous this brood will be remains to be seen.

COLFAX, LA.

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