

Foreign Grubs, a Menace of the Future

By B. R. LEACH

Associate Entomologist, U. S. Department of Agriculture and Consulting Entomologist,
U. S. G. A. Green Section

The eastern states, for number of years, have been fighting foreign beetles, in particular the Japanese beetle. Golf courses have suffered from the depredations of these pests. This article is the first of a series describing a successful fight waged against the grubs in a badly infected area.

AT ONE time or another almost every golf club has suffered from an invasion of grubs which injured the turf of the fairways and greens. This turf injury was due to the work of several of our native grubs such as the June Beetle (*Cotinus nitida*) and May Beetles (*Phyllophaga* sp.).

It has been the habit of a club so affected to stand by, helpless to prevent the turf injury, and wait until the grubs disappeared. The injured turf was then reseeded and things went on normally until the next grub invasion. Even had the club been entirely desirous of killing the grubs before the damage was done there were no known methods of doing so. Furthermore with our native grubs of sporadic appearance, the damage is usually almost complete before their presence is noted and the turf is then in such a weakened condition that it is almost impossible to save it. Usually grub troubles of this sort occurred at infrequent intervals, at least not frequently enough to threaten the safety of the club as a going concern.

Turf injury on golf courses, caused by

our native grubs, has never therefore been of such a chronically serious nature as to place it in the front rank of golf-course maintenance problems. That there are sound reasons for this status of our native grubs is fairly obvious when one studies their life cycles and biological environment. In the first place most of these grubs require more than one year to mature and they are mostly only killers of turf in the last year of their growth. Hence even though a club may be located in a heavily grub infested region, by the law of averages they will be the victims of serious grub injury only once in several years.

Furthermore our native grubs are heavily parasitized by other insects thereby being checked in numbers and capacity for turf destruction. In addition the soil of sections infested with native grubs teems with fungoid and bacterial disease germs detrimental to the grubs. In other words, nature strikes a fairly even balance. When the grubs become too numerous at which times golf clubs suffer, nature steps in with parasites and disease and reduces

the grub population below the point of serious turf damage. Parasites and disease then thin out for lack of grubs upon which to prey and the grub population again increases to the point of serious turf injury, and so on ad infinitum.

Grub Menace Increasing

I repeat therefore that native grubs have always been a source of annoyance to golf clubs but not sufficiently so to cause the golfing fraternity to insist on methods of control being made available. However, certain events which have occurred during the past few years threaten to change this semi-complacent attitude toward the grub problem and cause the control of grubs in fine turf to take the



Grass of fairway killed by grubs, Riverton (N. Y.) C. C., 1923.

front rank among golf course maintenance problems.

In 1918, the enactment of Quarantine 37 by the United States Department of Agriculture terminated a government campaign of many years duration designed to protect this country from the possible importation of foreign insect pests. By its provisions the importation of all plants with soil about their roots is prohibited and the proper governmental administration was set up to enforce the quarantine act. Unfortunately, we now know that this quarantine was not placed in operation soon enough to prevent some of these foreign soil insect pests from being imported.

At just about the time Quarantine 37 went into effect the Japanese beetle (*Popillia japonica*) was discovered in New Jersey. In 1921 the Oriental beetle (*Anomala orientalis*) was discovered in Connecticut and in 1926 the Autocerica beetle (*Autocerica japonica*) was discovered in New York State and New Jersey.

It may be asked why the presence of

these pests in this country was not discovered sooner and without the passing of the several years subsequent to the passage of quarantine 37 in 1918. The Japanese Beetle was discovered first undoubtedly because it is brightly colored and very active and conspicuous in the day time. The Oriental Beetle is a small, dull colored insect, hardly flies at all and hides out most of the time in the grass and weeds. Hence the presence of this insect was not discovered at New Haven, Connecticut until lawn injury became pronounced and lawn owners sent the grubs to the state entomologist. He in turn sent them to the British Museum for identification with the result that they turned out to be the Oriental Beetle, a native of Japan.

Grubs Are Turf Feeders

The Autocerica Beetle is a small, dull brown in color and about the size of a coffee bean. It was not discovered in this country until 1926 undoubtedly because it is a night flier and spends the daylight hours under ground. Hence it was not detected until its depredations became pronounced. It must undoubtedly have been present in the country for a good many years as it is present over an extended area in New York and New Jersey.

All of these three imported grubs are turf feeders of the first rank. The Oriental Beetle is probably the worst of the lot as it feeds very close to the surface, just under the grass crowns and grass so affected has small chance of recovery. The Japanese Beetle feeds about an inch below the surface and well-cared for turf can withstand a light infestation of this grub. When present in any real numbers however the turf is killed outright. The Autocerica Beetle probably ranks with the Japanese Beetle as a turf feeder, and in turf killing capacity, although its capabilities along this line have not been studied as long or as much as is the case with the other two species.

These three beetles, of oriental origin, are now present so far as is known, only in a few of the Eastern states and a determined effort is being made to prevent their spread by prohibiting the movement of all soil out of the infested areas. However, in spite of all that can be done there is every reason to suppose that these insects will ultimately spread out over the country and become firmly established in those sections where climatic conditions prove suitable.

Pennsylvania Chief Sufferer

The Japanese Beetle is now recognized in the Philadelphia area as a pest against which steps must be taken by golf clubs to prevent turf injury. In fact the treatment of the greens and some portions of the fairways (employing methods which will be described later) has now become an important part of the routine work of greenkeeping in that section. The Oriental Beetle has not as yet, to my knowledge, invaded a golf course, but it is doing serious damage to lawns in Connecticut and New York State. It is only a question of time before golf courses in that section will be compelled to treat their turf to prevent injury by this insect. I have just recently received a letter from a golf course at Mount Vernon, New York with specimens of beetles found on the greens. These proved to be the *Autocercia* Beetle, thus indicating that this beetle also will have to be reckoned with from the golf course standpoint.

As stated in the earlier portion of this article our native grubs have caused annoyance and loss to golf clubs only at intervals due to the fact that these grubs are held down by parasites and disease. Unfortunately it does not appear that we will escape so lightly with these imported species of grubs.

Yearly Treatment Needed

In the first place these imported beetles are not parasitized to any great extent as yet in this country and this condition cannot be corrected until the Federal Government's present campaign of parasite importation from the Orient has time to come to fruition. Secondly, all three of these grubs have a one year life cycle. By that I mean the egg to grub to beetle transition all occurs within one year which means that there is an annual crop of grubs which are two-thirds grown by August or September at which period they feed voraciously on fine turf and when present in sufficient numbers they ruin it.

This means that in those sections of the country infested by these imported beetles the golf clubs face a grub problem each Fall, and so far, in at least the Japanese Beetle, there have been no failures in the crop of grubs. It may be said therefore that in those sections infested with these beetles, grub control is now in the front rank of golf course maintenance problems and an added expense to the usual costs of conducting a club. The

old method of waiting for our native grubs to disappear won't work with these imported foreigners. It is a question of either treating the turf to prevent grub injury or losing the grass.

What Is the Answer?

In the foregoing account I have related in an entirely cold blooded manner the situation as I see it in relation to these three imported pests. If it brings a cold sweat to more than one Greens Committee chairman I am sorry but facts are facts. Besides there is now nothing in particular to sweat about anyway. Five years ago these grubs had several of us sweating and myself not the least of the lot for in 1920 I was handed the job of finding a method or methods of controlling these grubs in fine turf. During the next five years was when I did the sweating. What was accomplished in the way of control measures as a result of this seven years of research, how it was done, the extent to which the methods are now in practice and the co-operation I received from the United States Golf Association Greens Section will all form the subject matter of subsequent articles in this magazine.

Price Tags Are Silent Salesmen

HAVE a price tag on every article of merchandise in the shop, with the price plainly marked thereon. Many a member has come into the pro's shop for some trivial purchase and on the way out has become interested in some other item—a club, a bag, some golf hose.

If the member feels he'd like to own such an article, he looks for the price, which, if easily found and plainly marked often means the difference between a sale and the loss of a sale. The pro may be busy with another customer and rather than interrupt, the member may leave without purchasing.

Think it over.

The most important factor to be taken into account when deciding on the location of the new clubhouse is whether or not the new building will have the privacy it deserves. If possible, locate it so that trees hide the building from the public road.