

# Study Jap Beetle Control Methods

By DR. R. T. WHITE\*

**D**URING 1916 a few beetles were discovered in a New Jersey nursery not far from Philadelphia. It is presumed that several years previous to this time, the beetle was introduced as larvae overlooked in a shipment of Iris bulbs from Japan. The nursery, of course, could not be blamed for this unfortunate introduction. As soon as the seriousness of the pest was realized, an attempt was made to completely eradicate it by a clean culture program in the immediate vicinity of the nursery. All weeds and low shrubbery were cut or burned from the roadsides and idle land. Despite these measures, however, the beetle became well established, and has spread out each year since that time, until at present the area of continuous infestation covers approximately 21,000 sq. mi. in Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia and the District of Columbia.

In addition to the area of continuous infestation, isolated points have become infested in outlying states. In time, these small focal points build up and spread outward finally coalescing with neighboring points, often resulting in serious centers for spread.

## Extent of Beetle Spread

Trapping by the Quarantine Division has shown beetles in states as far distant as Florida on the south, Maine on the north, and Missouri on the west. These outlying infestations may be very slow to increase, but under favorable conditions a quite rapid build-up can result. In Asheville, N. C., during 1940, less than 20,000 beetles were caught, but during 1941, nearly 100,000 were trapped. A large number of towns in North Carolina are now infested. Likewise the number of local infestations in Ohio and Indiana have been on the increase during the past two years. In Chicago, and again in St. Louis, recurring outbreaks continue to harass local state and government agencies. An attempt has been made at these outlying places to eradicate by the use of arsenate of lead. These efforts have been successful to the extent that the

build-up of the beetle has been slowed down, but a few beetles continue to be found each year, and as the infested area spreads out, the cost of treatment will necessarily prevent its continued use.

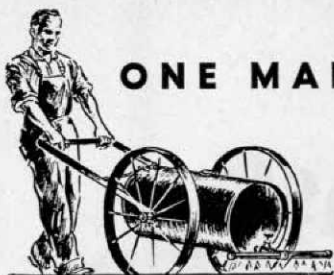
About one half of all adult beetles seen are females and each of these lays from 30 to 60 eggs during the course of her lifetime. These are carefully placed several in a place, in nice grassy spots so that when the egg hatches some 10 to 14 days later, the tiny grub will have ample roots to feed upon. After feeding for about two weeks, these grubs get too large for their skins, and so they go through a moult and become larger. Their appetites increase much as that of a growing boy, and they continue to feed and grow for another two weeks. Again they moult and become what we call third instar larvae (or just plain grubs). By this time they are capable of really eating large quantities of roots. This is the stage that causes serious damage to turf in the early fall if sufficiently large numbers are present. The highest count I have ever made in a single square foot digging is 165. I have heard of 200 per foot. Populations exceeding 20 per foot may seriously injure the turf. Vigorous well fertilized grass will withstand more feeding than poorly fertilized grass.

## Spend a 'Quiet' Winter

It is in this third instar stage that the grub passes the winter by burrowing 8 to 10 inches into the soil. At this depth the grub is not affected by temperature fluctuations and is able to quietly spend the winter. Some of the more elite in Florida will be able to enjoy the winter without going into hibernation and may thus have two generations a year instead of the customary one in the north. Grubs can exist in ground completely frozen or successfully pass the winter in soil completely submerged by water.

In the spring as the temperature warms the soil, the grubs become active and again start feeding. During late spring, very severe grass injury may again be noticed, the grubs at this time being very near the surface. Birds and skunks are often attracted to these injured areas and

\*GSA Convention Paper.



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may cause severe roughening of the ground in their efforts to obtain the grubs.

After the grubs have fed for some two months during the spring, they go into a rest period, known as the pre-pupal stage. After two weeks in this stage, at which time no feeding is done, the grub changes to the pupal stage, and gradually transforms during the next two weeks into an adult beetle, and the cycle again begins. Approximately 10 months are thus spent underground, the remaining two as an adult.

Control of this pest can be divided into four main types, namely: (1) Cultural practices, (2) Trapping, (3) Chemical (arsenate of lead), and (4) Biological (natural enemies). Any of these may be used alone or in combination. Varying degrees of success have been obtained with the different control methods and since government and state publications are available on the first three types of control, I will avoid more than a passing word on them. It is, I believe, generally conceded that arsenate of lead under most conditions gives an excellent control, but under certain soil types, even this fails, and some caution must of course be exercised in its use under any con-



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ditions in which it may be used.

Traps have a definite place in the control problem, but it seems doubtful if their use alone can check an increasing beetle infestation.

Clean culture methods are important in that the adult beetle prefers to oviposit in places which insure food for the resultant generation. Also any stirring of the soil containing larvae tends to destroy the grubs, and thus cultivation when possible will be of some aid.

In Japan, the beetle is not generally considered a serious pest, partly because of clean culture of all unused areas, and partly because of the natural parasitic insects living upon the beetle. Many of these parasites have been studied in the Orient and those showing the most promise were brought to this country in the hope that a sufficient number could be established here and that these would eventually hold the host in check. A great deal of good has been accomplished by two species of *Tiphia* wasps, but the build-up of the parasites seems slower than that of its host, so that this is necessarily a slow process.

*(To be concluded in April GOLFDOM)*

March, 1942

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