

Lawn Care

REG. U. S. PAT. OFF.

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BEETLE GRUB CONTROL

DURING the past several years many lawns, putting greens and other turfed areas in the northeastern portion of the United States have been ruined by the grubs of various beetles. Greatest damage comes from the grubs of those beetles having a one year life cycle, namely the Japanese, Oriental, and Asiatic Garden species. Grubs of May beetles are also troublesome but they have a three year life cycle.

Turf damaged by grubs appears to be suffering from lack of water. The grass turns brown and dies in irregularly shaped circular patches. The grass is severed at the roots so that it can be literally rolled up like a carpet. Severely injured turf often has a springy feel similar to that after the frost has gone out in the spring. If the sod is removed at the right time a colony of the feeding Grubs will be found.

When dry weather follows grub activity, as it frequently does, the lawn may be completely lost. Even though drouth doesn't follow a lawn is so weakened it is vulnerable to weed invasion, especially Crabgrass. Weeds are often blamed for causing poor turf, when actually they are the result.

The presence of grubs is often dis-

closed by flocks of birds such as grackles and starlings. They drill holes in the ground with their bills to feed on the grubs.

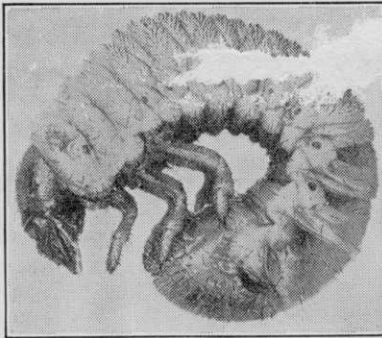
Beetle larvae are also a favorite food of skunks. They tear up the sod not to eat the grass but to get at and devour the grubs. Extensive damage to lawns from moles may also be traced to

grubs present. Moles and skunks will forage elsewhere for food after the supply of juicy, appetizing Grubs has been put under control.

Jap Beetle Grubs

The four phases (egg, grub, pupa, beetle) in the life of Japanese and similar beetles are completed in one year in the latitude of Pennsylvania and New Jersey. Farther north where the warmer seasons are shorter this may take two years. To the south there may be more than one cycle each year.

The milky-white eggs of these beetles are usually deposited during June or July in unshaded grass land to a depth of two or three inches. Since damp soil rich in humus is preferred, lawns and putting greens are especially favored. In a week or ten days the eggs hatch into grubs about the size of the head of a pin. They develop rapidly and are about one-third grown in two to four



Grub of Japanese Beetle, enlarged 3 times.
Courtesy U.S.D.A., Bureau of Entomology.

weeks. Their food is decaying organic matter and living grass roots. At first they consume so little that the damage to turf is negligible.

When the grub is one-third grown it casts away its first skin and gets a new and larger one along with a bigger appetite. Grubs begin to eat ravenously near the end of August when they are approaching maturity. They do their greatest damage to turf then as they lay away enough food to last them until spring. As the ground freezes they burrow deeper into the soil to protect themselves from sudden changes in temperature produced by alternate freezing and thawing.

In the following March or April as the soil warms the grubs crawl back near the surface to feed. Again they eat heartily to regain the weight lost during the winter. At this time they may damage turf seriously but the effects do not appear until the warm days of May or June. By then it will be found that many grass roots have been cut off just below the surface.

Appearance Of Adult Beetles

During May and June, grubs go into the resting or pupa stage and are gradually transformed into beetles.

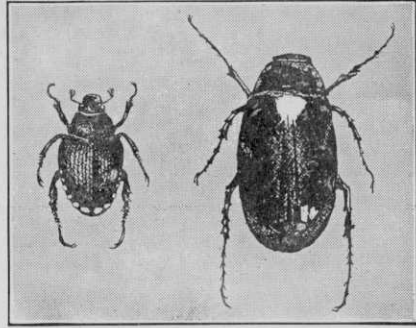
The adult beetles leave the ground to feed on the foliage of trees, shrubs and other plants. Sometimes they defoliate the attacked plants leaving only the stems or branches and the skeleton of the leaf structure.

After a few days of feeding the beetles mate and the female begins to lay eggs to start the cycle all over.

The female usually lays ten or more eggs before she returns to the surface to mate again and deposit another clutch of eggs. This routine is continued until she has laid about sixty eggs. Cold weather may halt this since it kills all adult beetles of the one year species.

Infested Localities

Since the Japanese Beetle was discovered in New Jersey in 1916, it has



Left: JAPANESE BEETLE. Actual size. An attractive creature of bright metallic green tinged with bronze. It has two distinguishing white spots at the tip of the abdomen and five others on each side. The Oriental and Asiatic Garden Beetles are slightly smaller, straw to brown colored with black markings.

Right: MAY BEETLE, also known as the "June Bug." Larger than the Japanese; dark brown color.

spread steadily, advancing 5 to 10 miles a year. It is thought to have been introduced around some iris roots from Japan. The natural migration of Jap Beetles has been sufficient to infest practically all of the Atlantic seaboard from southern Maine to Norfolk. Inland it has extended through most of New England, New York state, Pennsylvania, Maryland and Virginia.

Aside from the natural spread, beetles have been introduced in sections to the west and south. They have been transported on automobiles and trains and some have possibly been carried on plants that were slipped through the quarantine barrier. Japanese beetles are now pretty well distributed through eastern Ohio. Other isolated infestations are reported at Indianapolis, St. Louis, and in scattered Southern cities.

Oriental and Asiatic Garden beetles are found in Connecticut and in scattered spots along the Atlantic seaboard.

May Beetles

The life cycle of the May beetle is of three years' duration.

From April to June of the first year May beetles are found feeding on their favorite food such as oak leaves. They

mate at night, the female returning to the soil to lay eggs which hatch in three to four weeks. The resulting grubs live on organic matter and roots until cold weather when they hibernate for the winter. They remain in the ground all through the next year to emerge as adult beetles the third year.

The May beetle is found in almost any state north of the Ohio River and westward to South Dakota. May beetles appear every summer because different broods mature in different years.

Control Of Grubs

Fortunately the control of all these grubs is easily accomplished by poisoning the soil with Lead Arsenate. The grubs get a small amount of this poisoned soil while eating at the grass roots. It usually sickens them so they soon cease feeding and within three weeks they die.

Whenever damage appears as a result of Grub activities, Lead Arsenate should be applied. Grub injury is apt to show up in August and September resulting from the feeding of the newly hatched larvae. Damage again occurs in April and May when the old grubs

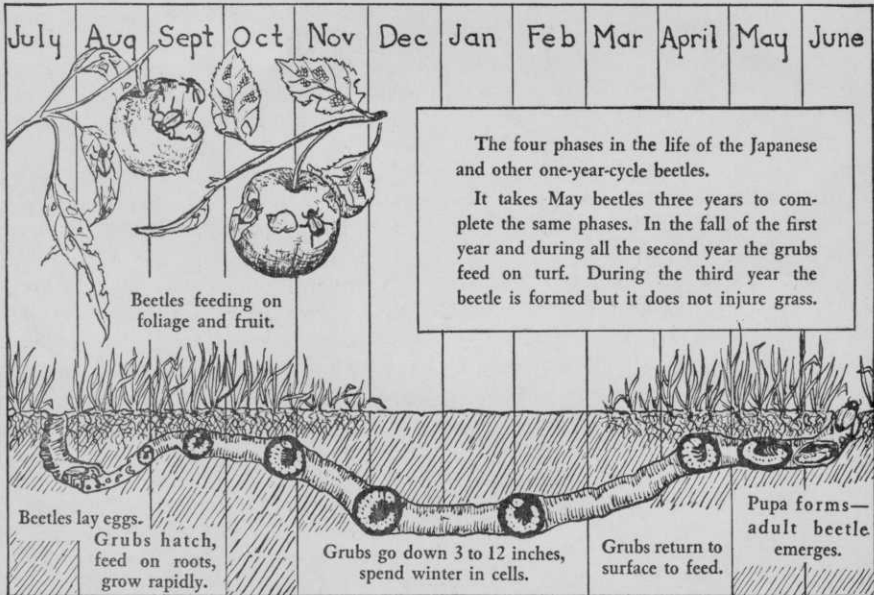
return to the surface to feed on roots after spending the winter hibernating.

The minimum application for light infestations is 5 to 10 pounds of Lead Arsenate per 1000 square feet. Even greater amounts may be needed on clay soils especially if quick results are wanted. In such cases the rate should be doubled. A light sandy soil may respond quickly to the 5 to 10 pound rate but the poison will not remain effective as long as in clay soil.

Winter and early spring is a good time for the treatment because alternate freezing and thawing carries the poison into the root zone where it will do the most good. A spring application may not be effective until later unless it is applied before late March.

In sections where grubs are apt to cause damage it is well to anticipate them and poison the soil in advance with a heavy application of Lead Arsenate. As much as 15 pounds to the 1000 square feet can be worked into the upper inch of soil prior to seeding. This may delay seed germination for a few days but it is only temporary.

One Lead Arsenate treatment, if prop-



erly made, is adequate to insure against grub damage for 5 to 7 years. Beetles may emerge from neighboring lawns and feed on shrubs in the vicinity. However if they deposit eggs in a poisoned soil the new grubs are killed before causing any damage. Lead Arsenate also keeps earthworms and several other pests under control.

Lead Arsenate is effective only as a preventive against future infestations of Grubs; its use does not repair damage already done. Timely fertilizing and reseeding is necessary to start new grass in place of dead turf and weeds.

Methods Of Application

It is difficult to apply dry Lead Arsenate evenly since it is such a fluffy powder and the quantity used is so small.

A good method of application is to mix the powder with soil, sand or compost and broadcast it by hand or with a spreader. About a bushel of carrier is needed for each 1000 square feet. It is well to wash the Lead Arsenate off the grass blades to prevent burning and to insure quicker penetration.

Lead Arsenate is a virulent poison and should be used with care. It may be mixed with bare hands, but it is better to wear gloves. Supposedly birds will not feed on Grubs or earthworms that have been killed or even made sick with the poison. Even though Lead Arsenate has been used many years for spraying trees, shrubs, and for Grub control in lawns, there seems to be no documentary evidence that it has been fatal to persons or domestic animals. Even so, care should be exercised to apply the poison evenly and to store safely any unused portion.

Lead Arsenate should be used sparingly in flower or vegetable gardens.

Some perennials will not grow in the presence of the arsenic found in the chemical and some vegetables take up the poison into their tissues.

The grubs of Oriental as well as Asiatic Garden beetles are also controlled with Lead Arsenate.

Natural Control Of Grubs

There are some natural enemies of Grubs and Beetles that help keep them in check. One of the major ones is the female of a certain species of parasitical wasps which digs into the soil in search of Grubs. The wasp finds and stings a Grub, causing temporary paralysis. While the Grub is inactive an egg is firmly deposited on its under surface. This hatches into a larva which feeds by sucking the body fluids of the host grub. In fifteen to twenty days it consumes the entire Grub.

Certain bacteria have been discovered which prove fatal to Grubs of Japanese, Asiatic, May and June beetles. This Grub infection is commonly called the "milky white disease." Credit for the development of this natural control method goes jointly to the U. S. Bureau of Entomology and the New Jersey Agricultural Experiment Stations. These agencies have prepared a bacterial inoculation which is applied to lawns to spread the milky white disease through Grub colonies. The disease is fatal to the larvae within 10 to 12 days after contact. Artificial propagation of the bacteria is necessarily on a small scale which limits the availability of this control method.

Poisoning Is More Effective

While natural enemies may be somewhat effective in controlling harmful Grubs and Beetles they will hardly approach the efficiency of a well timed application of Lead Arsenate.

O. M. SCOTT & SONS CO.



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