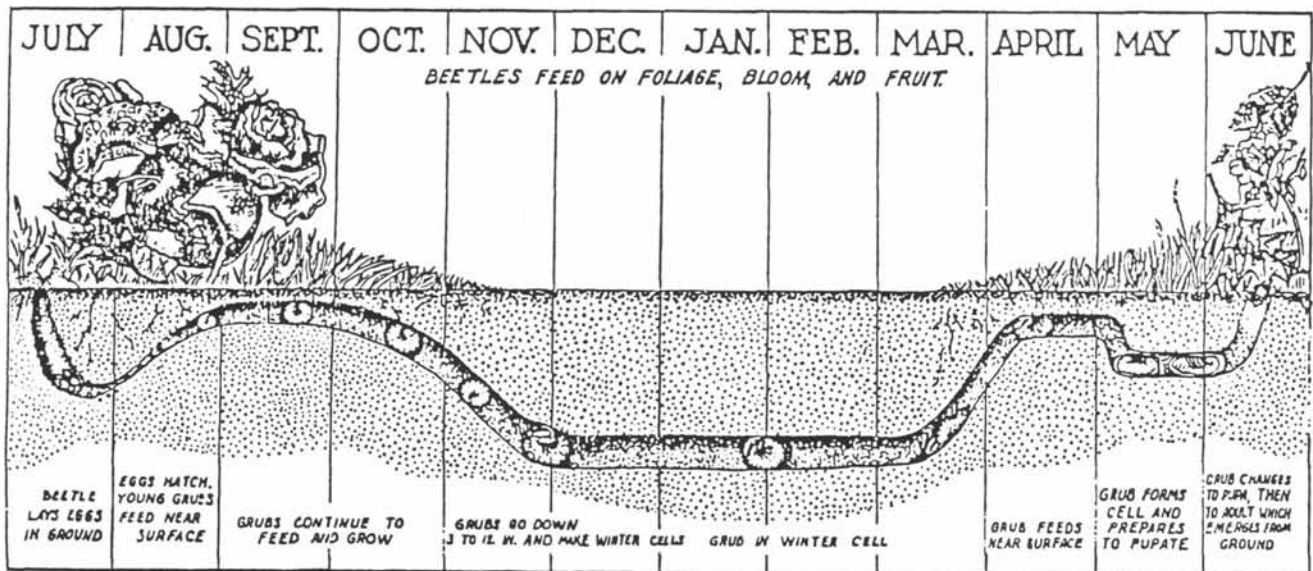


CONTROLLING TURFGRASS GRUBS^{1,2}

Harry D. Niemczyk
Turfgrass Entomology

OARDC - The Ohio State University, Wooster, OH 44691

Among the insect pests occupying the turfgrass environment, those that inhabit the soil or thatch-soil interface present the greatest challenge to the turfgrass manager. Control efforts require emphasis on getting a specific control material to a specific target: in this case the target usually lives beneath a layer of thatch. The extent to which one is successful in reaching this "TARGET" with enough material to kill it, is the extent to which control will be successful.



Seasonal life history of the Japanese beetle, Popillia japonica Newman.

- 1 Republication of this article in any form, whole or in part, is not permitted without written permission of the author.
- 2 The author intends no endorsement of criticism of products named, nor is criticism implied for products not mentioned.

Thatch and the "Target"

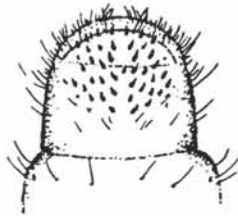
Several organophosphate insecticides are variously labeled for grub control. Among them are diazinon and chlorpyrifos (DURSBAN). Success with these two insecticides is limited by the fact that they characteristically have strong attraction for organic matter. This is particularly true with chlorpyrifos. In view of this, these materials are often bound to thatch before they reach the "TARGET". Other insecticides such as isofenphos (OFTANOL), bendiocarb (TURCAM), and trichlorfon (PROXOL), have relatively low affinity for organic matter and therefore are more effective because they reach the "TARGET". However, for reasons that are still unclear, even these insecticides do not provide 100% control (not that this degree of control is necessary!). What is known, is that when grubs are introduced into soil mixed with labeled rates of these insecticides, the grubs die.

All of the above insecticides do kill grubs, but the challenge is getting the material to them during a vulnerable period in their life cycle in sufficient concentration to achieve the desired results. Therefore, knowing the residual characteristics of the insecticide and the seasonal life cycle of the specific pest should determine the optimal time for application.

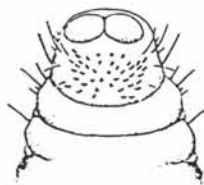
RASTERS OF SOME COMMON GRUBS



Japanese Beetle



Masked Chafer



Black Turfgrass Ataenius



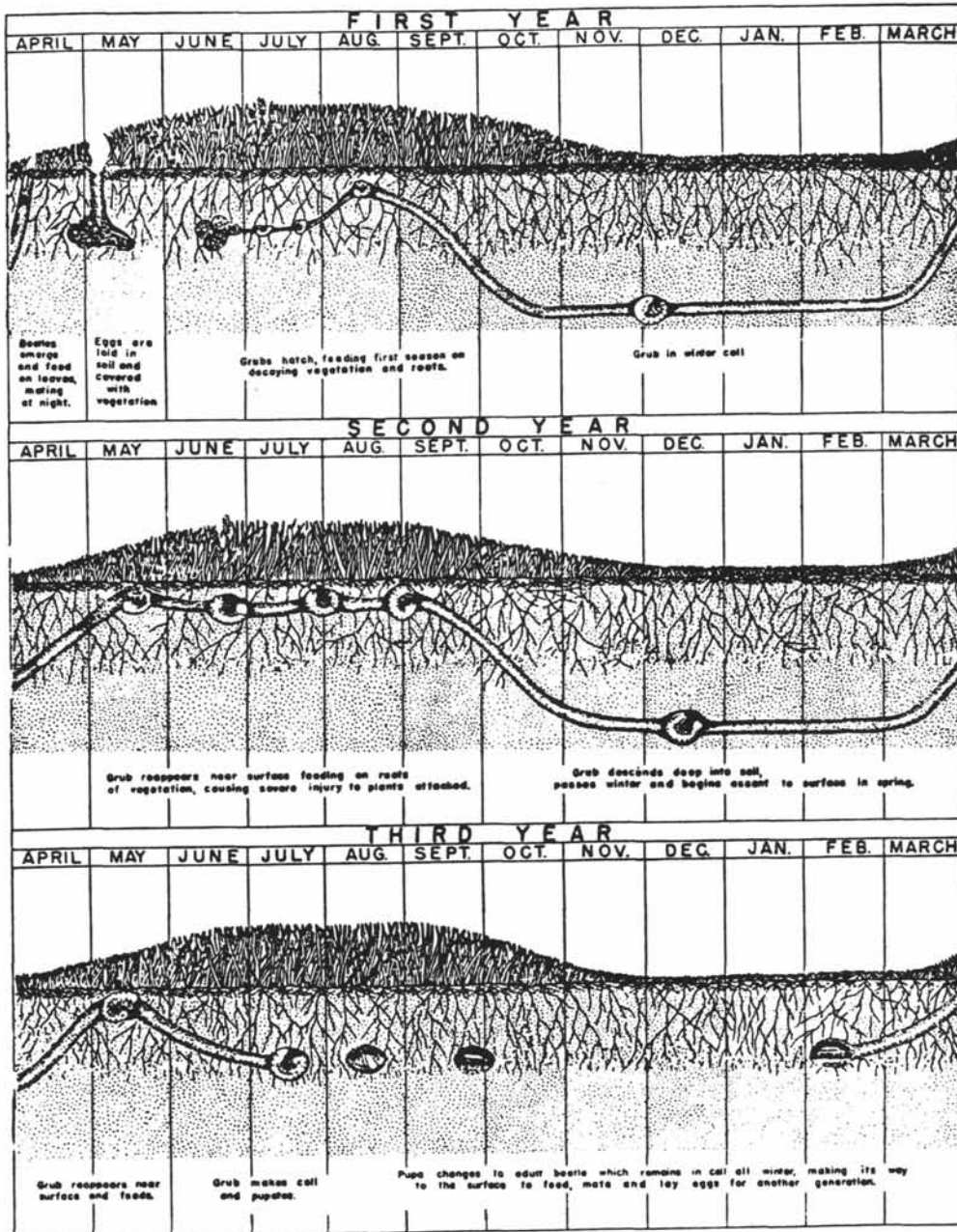
May Beetle



European Chafer

A good case in point is control of May-June beetle larvae. The life cycle shows the most vulnerable period to be during the fall of the first year

Life cycle of the May-June beetle



or early spring of the second. If controls are not "in place" (i.e., where the "TARGET" feeds) during these times, the chances of success are poor because by fall of the second year the grubs are large and very difficult to kill.

DISTRIBUTION AND WATERING

Proper distribution of any chemical or fertilizer is absolutely essential in achieving the desired results. Liquid formulations for grub control should be applied as source sprays; finer sprays are subject to drift and tend to volatilize the insecticide more rapidly once the spray reaches the turf. A volume of four gallons of water per 1,000 square feet is used by most of the lawn care industry when treating northern turfgrasses. This is a good practice. On the other hand, such high volumes of water may be impractical for golf courses where boom sprayers are commonly used to apply pesticides. If this is the case, care must be taken to use sufficient volume to obtain uniform distribution. With volumes less than four gallons of water per 1,000 square feet, application of irrigation before the spray dries on the grass blades maximizes potential control grubs. Many studies have shown that control declines when irrigation is delayed. Furthermore, liquid treatments applied in the late afternoon or evening are less subject to breakdown by sunlight and high mid-day temperatures.

When granular formulations are used, the grass blades should be dry at the time application is made so the insecticide particles do not stick to the grass blades but bounce off and sift into the thatch. This brings a concentrated particle close to the "TARGET" and also provides protection from breakdown by light and other environmental factors. While the urgency to irrigate following granular application is not as immediate as for liquids, it should be done as soon as possible. In this case, one-half inch of water is often advisable.

TANK pH

Liquid insecticides are variously subject to breakdown when the resulting solution is substantially alkaline. The manufacturer is the best source of information on the extent to which their material is subject to such breakdown. However, when the water used to prepare tank mixes is at pH 9 or higher, one should become suspicious. At this point it might be advisable to measure the pH of the final tank mix. If this is still high, products are available to lower the pH. Low pH is usually not a problem where the insecticide stability is concerned.

As a general statement, it is a mistake to leave tank mixes stand overnight in preparation or expectation of use the following day.

NEW INSECTICIDES

OFTANOL^R (isofenphos)

During 1983, the Mobay Chemical Corporation received Federal registration for four formulations of their insecticide Oftanol; the 5% granular, 1.5% granular, 1.25% granular with fertilizer, and a "2" formulation (2 lb/gal. liquid). This Federal registration replaces the need for special local needs labeling of these insecticides under Section 24c of FIFRA. The "2" formulation fills an important need among many segments of the turfgrass industry who wish to use liquid applications. It is expected that through the licensing process, the 1.5 and 1.25 granular formulations will become available to homeowners at garden centers, discount stores, and other similar

outlets. Research data on these formulations indicate they are as effective as the 5% granular formulation.

TRIUMPH^R (isazophos)

Expectations were that the new CIBA-GEIGY insecticide Triumph would obtain Federal registration in 1983; however, this did not occur. The original submission, made in 1982 was acted upon by EPA and approval is expected during the Spring of 1984. When registered, the 4E (emulsifiable) formulation will be available for professional use by individuals such as golf course superintendents, and operators of lawn care businesses. The 1% granular is intended for use by homeowners.

Research data on the effectiveness of Triumph show it to be effective against a broad range of turfgrass pests including grubs, chinchbugs, billbugs, sod webworms, and cutworms. The label rate for grubs is expected to be 2 lb ai/A and 1 lb ai/A for surface insects. The rapid effectiveness of this insecticide against grubs and the fact that this material moves through thatch readily, are two of its more advantageous characteristics. The residual effectiveness of Triumph shows no evidence of long residual for extended control of insects such as grubs, but instead as a very fast acting material useful for removing existing infestations.