GOLF COURSE INSECT PROBLEMS AND THEIR IMPORTANCE TO YOU

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INTRODUCTION. Two serious turf insect pests are exclusively golf course problems - Ataenius spretulus beetles and the Hyperodes weevil. The scarabaeid grub complex, loosely termed white grubs, are also serious pests of golf course turf. In addition they are troublesome on home lawns, parks, cemeteries and wherever else turfgrass is maintained. Each of these insect problems will be discussed in some detail.

ATAENIUS SPRETULUS. History and distribution. There is a need for a more appropriate common name than dung beetle which is often used to refer to this insect. This term includes many insects belonging to the same subfamily to which Ataenius belongs.

The 3 early reports of isolated and incidental turfgrass damage caused by this insect were in 1932 in Minnesota, 1935 in Massachusetts, and 1969 in New York. Adults of this native insect have been collected from all but 7 of the 48 contiguous states.

Recent large-scale serious damage was reported in 1974 and has persisted every year since. The area of major concern extends from Illinois to the Atlantic Coast and from Kentucky into Ontario, Canada.

Biology. Adults are about 5 mm in length, coal black and of the typical scarabaeid appearance. Adults overwinter in roughs, hedgerows, etc., and become active in March or April. They may be seen in swarms in the evening of warm sunny days or may fly to lights. Eggs are laid in clusters within 1/2 inch soil depth in May-June.

Damage is present, late June and July as the grubs feed on grass roots at the soil-thatch interface. Grub populations of 100-300/square foot are common. Wilting of the grass when viewed towards the sun is the first evidence of damage. Soon thereafter patches of grass will die. Host plants in descending order of preference are annual bluegrass, bent and Kentucky bluegrass. There are 2 generations each season in most areas with adults of the 2nd generation overwintering.

Control. Most of the studies on developing control have been conducted in Ohio. Their work indicates that adult control with diazinon at 6 lbs/acre before egg laying is the most effective. Insecticides in descending order of effectiveness in killing grubs appear to be fensulfothion (Dasanit^{R}), diazinon, CGA-12223, bendiocarb, and trichlorfon (Dylox^{R}, Proxol^{R}). All materials must be watered in thoroughly to be effective. None of the insecticides are registered as yet.

In New York State, the Ataenius problem has been diminishing in importance since 1975, the most serious year. In every situation where damaged turfgrass has been examined, there has been a high incidence of milky disease in the Ataenius grubs. Known damage has never occurred again at the same sites in subsequent years. We feel that this milky disease is an important contribution towards the diminution of the Ataenius problem in New York. This bacteria is entirely different from the bacteria causing milky disease of the Japanese beetle.

HYPERODES WEEVIL. History and distribution. This insect was first recognized as a pest of annual bluegrass on golf course fairways and greens in the mid-60s on Long Island and Connecticut. More recently it has been a turf pest in Westchester County, New York, Pocono Mt. regions of Pennsylvania, and to a lesser extent in western New York and in Ontario, Canada. There is no reason why this insect cannot destroy annual bluegrass anywhere in the country. In retrospect much of the fading out of annual bluegrass during mid-summer in the original problem areas may have been due to this weevil.

Biology. Adults are 3.5-4 mm long, black to dark gray with scattered grayish-white scales and patches of yellowish hairs and scales. Being a weevil it has a distinct "snout." The destructive larvae is a legless white to creamy insect about 4.5 mm long when mature.

Adults overwinter in litter under trees and at the base of grass clumps. Primary diapausing sites appear to be white pine litter where populations of over 100/ft^2 are common. Migration into fairways for adult feeding and egg laying starts about mid-April and continues for at least a month. Eggs are placed in the stems where young larvae feed before finally feeding on the crown of plants. Damage first shows as yellowing spots of turfgrass but soon large patches die out. Damage during mid-June into July is the most severe but additional minor damage also occurs during late July and August.

Control. Hyperodes weevil is successfully controlled with chlorpyrifos (Dursban^R). In the latitude of Long Island application is made during a 2-3 week period when Forsythia is in full bloom through the full calyx color period of flowering dogwood. This occurs from about mid-April into the first week in May. Diazinon is also effective but requires 2 applications, in mid-April and again in mid-May. Compound CGA-12223 is highly effective when applied during a 4-6 week period following full bloom period of Forsythia. Summer infestations are also successfully controlled with single applications of chlorpyrifos or CGA-12223. At present it is highly questionable whether CGA-12223 will ever be commercially manufactured.

SCARABAEID GRUBS. History and Distribution. Some of our most serious pests in this group were introduced around 1915-20 and include the Japanese beetle, the Asiatic garden beetle, and the Oriental beetle. The European chafer is a more recent arrival and still of limited distribution in the Northeast. Native insects of importance in this complex includes the northern masked chafer and many species of May beetles.

The Japanese beetle is the most serious of the entire group because it occurs in all but 2-3 states east of the Mississippi River. It is a very destructive pest as an adult, feeding on nearly 300 species of plants. Included are many ornamentals, fruits, vegetables, field and forage crops. There has been a steady increase in populations of most of these species and appears that this cycle of increasing populations will continue.

Biology. With the exception of the May beetles which generally have a 3 year life cycle in our latitude, all others generally have a 1-year life cycle. They overwinter mostly as 3rd instar grubs below the frost line. They migrate to near the soil surface in spring about April and resume feeding for 4-6 weeks before pupating. Adults of most species are present during the first half of summer depositing eggs in moist soil. Third stage grubs of the succeeding generation are present again during the fall. They feed near the soil surface into October or November depending on the species and then migrate downward for diapause.

Turf damage shows up first as yellowing grass during late summer and early fall. The grubs feed on grass roots just under the soil surface or in the soil-thatch interface. As feeding continues the grass may die in small to large irregular patches. Damage becomes apparent in the fall or may not show up until next spring. More than 10-20 grubs/square foot can kill the turf in one season, although it is not uncommon to find over 100/square foot.

Control. Phenominal control of grubs of all species was accomplished with chlorinated hydrocarbon insecticides. There are many lawns where protection is still being provided by treatments made 5-10 years ago. With development of resistance to these compounds and loss of registration we must now rely on several organophosphate insecticides for grub control. These materials must be applied on an annual basis with the most effective period being mid- to late summer. Diazinon, chlorpyrifos, trichlorfon are registered for general usage. Because of the short residual life of these materials and their adherence to thatch their failure to control grubs is not uncommon. Prospects for improving control with organophosphates is not very promising at present. The only effective carbamate, bendiocarb, does not show more than a mediocre promise.

Biological control. Milky disease and the imported spring tiphia wasp, both highly effective agents against grubs of the Japanese beetle in times past, appear to have lost much of their influence. There is evidence that grubs have developed resistance to the milky disease bacteria in one locality. The tiphia parasite is far less common than previously found in the 1940s and 50s and may require more years of high grub populations to again regain sufficient population density to be of much value.