

# COMING BACK

A pest of the past, the green June beetle, is once again causing headaches for many in the Eastern United States. The pest was silent for 30 years.

by Ruth S. Salvaggio and Dr. John L. Hellman

**T**he green June beetle is making a comeback.

The pest, *Cotinis nitida* L., has increased so much in numbers the last several years that it is now common in turf of the eastern United States.

A native from Massachusetts to Kansas and south to Florida and Texas, the green June beetle caused severe damage to the Capitol grounds in Washington, D.C. around 1880 (Chittenden and Fink, 1922).

It continued to caused damage to turf, tobacco beds, and vegetable crops for several decades (McKinney and Milan, 1926).

In the last 30 years, it has received little notice except when the adults fly in July. Today, the green June beetle population has increased once again and is causing damage from Long Island to the Carolinas.

A closely related species, *Cotinis texana* Casey, shares the same common name but is dominant only in the southwestern states (Ritcher, 1945).

## Identification

The green June beetle adult, usually  $\frac{1}{4}$  to 1 inch long and  $\frac{1}{2}$  inch wide, is usually forest green on the top, and may or may not display lengthwise tan stripes on the wings.

Its underside is metallic bright green or gold, bearing legs with stout spines to aid in digging.

In Maryland the names "June bug" and "June beetle" are commonly used for this insect. However, do not confuse the green June beetle with the familiar brown May or June beetles that fly toward light on summer nights. The green June beetle adult flies only during the day.

Only the immature or larval form of this beetle causes damage to turf. The larvae are white grubs with three growth stages and are similar to those of many other scarab species.

Their body lengths reach  $\frac{1}{4}$  inch,  $\frac{3}{4}$  inch, and 2 inches, respectively.

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The green June beetle grub crawls on its back, is about the same width along its entire body length, and has stubby legs when compared to other white grubs.

The larvae have stiff abdominal bristles to gain traction.

Other typical white grubs, like the Japanese beetle grub, are narrower, have longer legs, and crawl right-side up.

## The life cycle

The green June beetle completes one generation each year. Adults begin flying in June and may continue into September. The peak number of adults occurs in a two-week, mid-July period in Maryland and Virginia.

On sunny days, adults fly over open grassy areas, while at night, they rest in trees or beneath the turf's surface.

Green June beetles are frequently mistaken for bees because their wings emit a "buzzing" sound as they fly. The adults are attracted to flowers and feed on the sap of trees, apparently causing no damage.

They are attracted to fruit and are known to attack soft-skinned fruit such as figs, peaches, grapes, and apricots. Hence, in southern states, they have been dubbed "fig eaters."

The adult female releases a pher-

omone which attracts males around her on the ground or on lower limbs of trees and shrubs. Males often fly low over the grass trying to locate females.

After mating, females burrow 2 to 8 inches into the soil to lay some 20 eggs at a time. Females are attracted to moist, sandy soil with high organic matter but are found in several other soils.

Historically, grub infestations have stemmed from piles of manure which were spread for fertilizer. However, in more recent times eggs and grubs may be in mulch that was exposed during the egg-laying period.

The incorporation of composted sewage sludge products and other organic materials have made many sites more attractive to and favorable for these beetles.

Most eggs hatch in late July and August, and by the end of September, most are third stage larvae.

The larvae feed on dead organic matter in the soil and thatch, as well as on living tissue. The grubs remain active into November in Maryland. In most southern states grubs may be



A golf course tee damaged by the green June beetle. Notice the difference between the grass on the tee and the grass in surrounding areas. Grass cut at a greater height is less stressed and damage is less visible.

**TABLE 1**  
**Chemicals for Control**

Formulation	lbs. AI/A		Label Rate/ 100 sq. ft.
	Lowest	Label	
Sevin 80S	6.0	9.0	4.0 oz.
Diazinon 4EC	2.0	5.5	4.0 fl. oz.
Proxol/Dylox 80SP	---	8.0	3.75 oz.
Turcam 76WP	2.0	4.0	2.0 oz.

come active on warm winter nights.

In colder areas they overwinter as third stage grubs in burrows 8 to 30 inches deep. They resume feeding once the ground warms in the spring and change to pupae after a few weeks.

In Maryland, pupation occurs in late May or early June. The adults begin emerging about three weeks later.

### Damage to turf

The green June beetle grubs differ from other white grubs by their unusual habit of tunneling, which damages turf.

Smaller stage grubs tunnel in the top four inches of the ground, loosening the soil, eating, and thinning the thatch. In Maryland, this starts in early August when the disturbed grass may wilt or die if conditions are dry. The damage is not obvious when grub density is low or if the grass receives ample moisture.

As the grubs grow, they burrow deeper, creating more severe damage. Tunnels to the surface are kept open and the grubs push little mounds of loose soil—similar to earthworm cast-

ings—to the surface.

To determine whether a mound was made by a green June beetle grub, wipe the mound away and feel for a hole about as wide as a finger. Fecal pellets may also be present. Fresh activity is especially visible after a heavy rain.

The mounds and holes are visible by mid-August but the damage becomes more pronounced in following months as grubs continue to grow.

The grubs do feed on some roots but the major damage to the turf is due to the upheaval of the soil and dislodging of roots from the soil.

The green June beetle grubs, especially third stage grubs, come to the surface at night to feed and may at times, "graze" on the turf. Grubs may also be found in the twilight hours and on overcast days.

Their trails through dew are frequently seen on golf course greens. The mounds and holes disfigure turf while the tunneling kills the grass. Drought-stressed turf and grass that is cut very short succumbs easily to this damage.

Grass cut at a greater height is less stressed and the damage is less visible.

Grass species with broader blades—such as tall fescues—hide damage better than fine-bladed grasses such as ryegrasses, bentgrasses, and red fescues.

These grubs also cause indirect problems. Spaces open up as the grass dies, allowing for weed encroachment. Turf managers using reel mowers say the loose soil from the mounds accumulates and dulls the cutter blades especially when dew is still on the grass.

Additionally, predators—small animals and birds—damage turf as they dig for the grubs.

### Biological control

Today there are no effective biological agents available to control this grub.

The most common parasite, a type of digger wasp (*Discolia dubia* Say.), captures a grub, brings it into the nest, and lays an egg on it. The resulting larva feeds in the grub, eventually causing death.

In 1985, many golf course superintendents reported a higher number of digger wasps around sand traps, a direct result of more green June beetle problems.

Though these wasps help reduce the grub population, they cause fear because of their stinging tendencies.

Milky disease products, effective against Japanese beetle, do not control green June beetle grubs. *Bacillus thuringiensis* Berliner products have no effect on white grubs.

### Control recommendations

To prevent damage to turf, one must apply controls to grub stages before many mounds are evident. Damage should be expected if high grub populations were present the previous year or control was inadequate.

An increase in adults from the previous year is an indication to expect damaging populations.

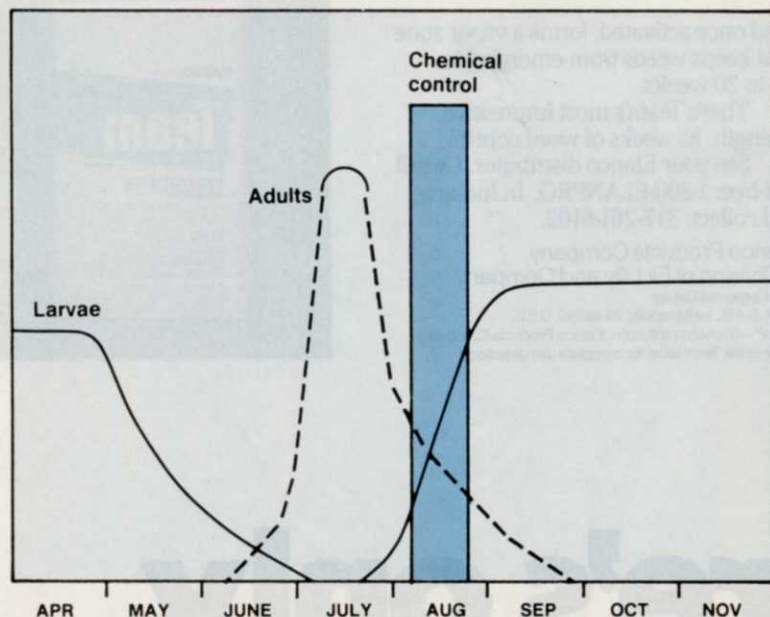
One can determine density of grubs in August by digging a square foot of soil four inches deep and counting the number of grubs.

After mid-August, samples should be 10 inches deep to find the larger grubs. If more than five grubs per cubic foot are present, control is necessary.

Insecticides are effective on all grub stages and applications are warranted anytime between August and September, provided damaging numbers remain active.

Spring chemical applications are not generally recommended since the grubs are active just a few weeks and

## NUMBER OF GREEN JUNE BEETLES



The green June beetle life cycle showing the period to apply chemical controls in order to prevent turf damage in Maryland.

many more may have pupated by the time damage is obvious. Once the grubs reach the third stage in August or September, they migrate freely and

can easily move from an infested area to an adjacent area.

To protect golf course greens, treat the greens, collars, and a few yards

beyond the collars. Insecticides which also control sod webworms, cutworms, and armyworms may be selected.

If fairways are treated, the rough areas should be spot-treated where there are high grub populations. The highest grub populations are likely to be found where the adult beetle population was most concentrated.

The green June beetle grubs are effectively controlled by a number of insecticides labeled for grubs (see Table 1). Even insecticides that do not penetrate the soil work well because these grubs come to the surface and are exposed to the materials.

Sevin and Diazinon are consistently effective in controlling the green June beetle grubs and both are registered for homeowner use. Proxol and Turcam also provide good control.

Application of these insecticides must be immediately followed by irrigation with  $\frac{1}{2}$  inch of water, or timed with rainfall.

In Maryland, spring applications of Oftanol have not effectively controlled the green June beetle grubs. Late summer applications of Oftanol also failed to provide adequate control of these grubs within one week. However, tests will be continued to investigate Oftanol grub control over longer time periods.

Turfgrasses recover from damage significantly once stress factors are removed. For example, species with stolons and rhizomes may repair the damage once the grub population is controlled.

The damage resulting from the grub tunneling is less severe when grass receives sufficient moisture.

A word of caution to those treating for green June beetles: they come to the surface and die, causing a foul odor as they decay.

Turf managers have not found poisoned birds after applying chemicals to control these grubs but it may be wise to consider it a possibility and be watchful.

Finally, monitor treated areas carefully because migrating grubs may reinfest once the chemicals have broken down. It may be necessary to retreat some areas to protect them from damage.

WT&T

### REFERENCES

- Chittenden, F.H. and Fink, D.E. 1922. The Green June Beetle. USDA Bulletin. 891:1-52.
- McKinney, K.B. and Milan, J. 1926. The Green June Beetle Larva in Tobacco Beds. USDA Farmers Bulletin. 1989:1-5.
- Ritcher, P.O. 1945. North American Cetoniinae with descriptions of larvae and keys to genera and species (Coleoptera: Scarabaeidae). Kentucky Agricultural Experimental Station Bulletin. 476:1-39.

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