

# INSECT REFERENCE

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## Green June beetle, *Cotinus nitida* (L.)

### DESCRIPTION OF INSECT

Eggs, larvae, and pupae are found in the soil, but adults are present above ground. Green June beetles have a one year life cycle.

#### Eggs:

Eggs are dull white when laid and about 1/16 inch in diameter. They absorb moisture from the soil and increase in size to about 1/8 inch. Eggs are laid in a cluster of 10-30 eggs and a female may lay from 60-75 eggs. Eggs hatch in about two weeks.

#### Immature stage:

White grubs: Larvae are unique in that they have stiff abdominal bristles on the grubs back, short legs, a rather consistently uniform body shape with parallel sides. The grubs have three instars and the approximate sizes are: 1<sup>st</sup> instar – ¼ in., 2<sup>nd</sup> instar – ¾ in., and 3<sup>rd</sup> instar – 2 in. These grubs have the unique habit of emerging from the soil and crawling on their backs. They construct vertical tunnels in the soil.

Pupae are about 1 inch long and whitish at first, but darkening through time. The pupal cell resembles a bird's egg and is covered with soil particles held together by a sticky secretion.

#### Mature stage:

The adult beetles are quite large (¾ to 1 inch long) and vary in color of the wings from dull brown to velvety forest green. The outer margins of the wings have a thin band around them that varies from tan to orange-yellow. The adults prefer to feed on overripe fruits such as peaches, tree sap, and other sugary foods.

#### Damaging stage(s):

The larvae or grubs are the damaging stage and almost exclusively, the third instar is the damaging stage in late summer through fall and again in the spring.

#### Predictive models (degree day, plant phenology, threat temperatures, other)

There are no predictive models for green June beetle grubs. The timing of beetle flights and grub appearance is consistent from year to year. Populations often cycle through high to low levels every 5 or 6 years.

#### Life cycle:

Beetles emerge in the summer from pupal cells. The adults fly over open grassy areas and often fly early in the morning and rest on vegetation or under thatch at night. Eggs are laid in mid summer and hatch in two weeks, Grubs grow to the 3<sup>rd</sup> instar by late summer, early fall and overwinter in that stage. The grubs feed briefly in the spring before pupating.



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## **Conducive environmental conditions:**

Too much thatch, composted yard waste, and the use of manure-based fertilizers in the spring and summer can create a more attractive and more favorable site for green June beetle grub infestations. Prefers light-textured soils and requires at least 20 in. of rain or irrigation per year.

## **Geographic distribution:**

Eastern United States into Texas and small area in southern California. Through the transport of plant materials and soil, this pest has the potential to spread to additional areas.

## **DAMAGE CAUSED:**

### **Plants attacked:**

Green June beetle grubs attack all turf types and particularly prefer moist, light-textured soils with higher organic matter. Little feeding on the roots actually occurs.

### **Symptoms of damage:**

Vertical tunnels cause mounds of soil to be produced. Tunnels may extend 18 inches deep.

Thinning of turf, weed encroachment, drying out of soil

Tunneling near the soil surface, loosening of soil

Presence of or damage from moles, raccoons, skunks, birds.

Grubs found on sidewalks, garages, etc in the morning

### **Timing of damage:**

Visible damage typically begins in late summer through fall.

Damage will continue in fall until soil becomes too cool for activity

Damage will appear again in spring as soil warms until grubs pupate in late spring.

Preferred sites often suffer from infestations year after year, but often cycle through low and high years of damage every 3-5 years.

### **Insects that look similar; Pests that cause similar damage:**

Areas with a serious green June beetle infestation may have a similar appearance to mole cricket or earthworm infestations. Drought stress may also resemble the affect of grub tunneling.

## **MONITORING TECHNIQUES:**

Soap flush will NOT bring white grubs to the surface. Beetles are often noticed flying or "dive-bombing" turf areas in the morning. The first signs of small mounds of soil pushed up should be investigated. Watch for signs of a large, dark blue wasp flying in a figure 8 pattern about one foot above the turf. This is a parasitic scoliid wasp that is present when green June beetle grub populations infest an area.

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## THRESHOLDS:

There are no hard and fast thresholds for this pest. Some turfgrass may be able to tolerate 6 to 7 grubs per square foot and turf with thicker blades and higher cut tend to hide the damage better. Most turfgrass will recover given proper soil moisture.

## MANAGEMENT STRATEGIES:

Management of thatch and organic matter can help reduce the attractiveness of an area to this pest. Composted yard waste or manure based fertilizers applied in the spring or early summer will increase the likelihood of an infestation. Treating an infestation in late summer/early fall once the grubs are large with a surface insecticide such as carbaryl (Sevin) will provide good control, but the grubs die on the surface within 12 hours. The next few days will consist of thousands of dead unsightly and smelly grubs lying on the surface.

Follow resistance management guidelines by rotating products as outlined in IPM Template Reference "Insecticide Resistance Management Groups."

Green June beetle management strategies				
TYPE	TIMING/ THRESHOLD	PRACTICE		COMMENTS
Cultural	N/A	Avoid excessive thatch and the presence of organic matter, particularly in summer when adults are flying		
Biological	Apply when grubs are small (late summer)	Entomopathogenic nematodes. For current suppliers, see <a href="http://www.oardc.ohiostate.edu/nematodes/nematode_suppliers.htm">http://www.oardc.ohiostate.edu/nematodes/nematode_suppliers.htm</a>		Pre and post application irrigation critical  Not recommended for heavy infestations
Chemical	Apply during egg laying, egg hatch or when grubs are small	Active Ingredient (Product)	Label signal word	Sprayable and granular formulations typically perform the same
		Carbaryl (Sevin)	Warning	
		Clothianidin (Arena)	Caution	
		Halofenozide (Mach 2)	Caution	Irrigation post-treatment is recommended for all products except carbaryl
		Imidacloprid (Merit)	Caution	
		Imidacloprid + bifenthrin (Allectus)	Caution	
Thiamethoxam (Meridian)	Caution			

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