

# Annual White Grubs

## DESCRIPTION OF INSECT

- Asiatic garden beetle, *Maladera castenea*
- European chafer *Rhizotrogus majalis*
- Japanese beetle, *Popillia Japonica*
- Masked chafers, *Cyclocephala spp.*
- Oriental beetle, *Exomala orientalis*



### *Immature stage:*

C-shaped, thick bodied, creamy white with yellow to brown head capsule

Chewing mouthparts, 3 pairs of short yellow legs

Size ranges from 3/8 in black turfgrass atenius (BTA) to 2 in green June beetle (GJB)

### *Mature stage:*

Beetles

Colors range from green to shades of tan, brown, or black

Stout and oval, size ranges from 3/16 in (BTA) to 1 in (GJB)

Forewings hardened, forming a shell like cover over membranous hindwings

Forelegs with teeth like projections used for burrowing

### *Damaging stage(s):*

larvae (grubs) only; adult beetles can be problematic on surrounding ornamentals

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

[Threat temperatures](#) can be used to trigger preventive treatments. See the article, "[Threat temperatures](#)" for threat temperature triggers for each white grub species.

Damage appears in summer and early fall as grass is heading into dormancy or experiencing drought stress

### *Life cycle:*

1 year from egg to egg

Adults mate and lay eggs in mid-summer (June through August)

Eggs hatch in 2-3 weeks

Grubs (larval stage) molt twice becoming full grown by fall

Grubs move down into soil profile due to decreasing soil temperatures in late fall

Feeding resumes at the root zone as temperatures warm in the spring

Larvae move down in the soil to pupate, a few weeks later adults emerge

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## *Conducive environmental conditions:*

Well irrigated, or areas with high soil moisture are conducive for survival of eggs and larvae

Damage occurs summer to early fall

Damage occurs more rapidly when turf is subjected to other stresses (i.e. drought conditions)

## *Geographic distribution:*

worldwide

## **DAMAGE CAUSED:**

### *Plants attacked:*

Roots of all turfgrass species are susceptible

### *Symptoms of damage:*

Yellowing and thinning of grass similar to drought stress

Irregular dead patches of turf that continue to increase in size

Turf is easily pulled back due to loss of roots

Predators (geese, skunks, armadillos, javelinas) rip up turf when foraging for grubs in high density areas

### *Timing of damage:*

Damage occurs late summer to early fall

Damage occurs more rapidly when turf is subjected to other stresses (i.e. drought conditions)

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

Billbugs

## **MONITORING TECHNIQUES:**

Monitor adult flight using pheromone traps for day active beetles (i.e. Japanese beetle, Oriental beetle) or black light trap for those active at night (i.e. masked chafers.)

For grubs, use a standard golf course cup cutter or flat spade to sample the upper 3-4" of soil under the turf. The majority of grubs can be found within the 2" of soil just below the thatch.

## **THRESHOLDS:**

Thresholds will vary depending on the species of grub, turf species, management regime, and environmental conditions.

The majority of species will incite damage at 6-10 grubs per square foot.

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## MANAGEMENT STRATEGIES:

- Follow resistance management guidelines by rotating products as outlined in [“Insecticide Mode of Action Classification Scheme”](#)
- Consult [North Carolina State “Pest control for Professional Turfgrass Managers](#) for pest control options
- Always consult the most recent version of all product labels before use.