Gardening Basics

Grubworms

White grubworms are the larva form of insects commonly known as May or June beetles. More than 100 species of scarab beetles in Texas are described as white grubs. May-June beetles (*Phyllophaga congrua)* and the southern masked chafer (Cyclocephala lurida) cause Texas lawns the most damage. The larval form has a cream-colored body with a brown head. They are up to one inch long and are "C" shaped. They have three pairs of legs on each of the first three segments behind the head. They have mouth parts for chewing. The green June Bug *(Cotinus nitida)* is velvet green on the top, metallic green below, and approximately one inch long. They feed primarily on decaying organic matter and usually do not injure lawns.

May-June beetles (Genus Phyllophaga) Harris 1827
Whitney Cranshaw, Colorado State University, Bugwood.org (CC BY 3.0 US)

Life Cycle

The brown adult beetles emerge from the ground to mate in early spring to summer. Males generally fly at night and are often seen in large numbers around lights. Peak flights occur in mid to late June in Texas, usually after significant rainfall or irrigation. In 3 to 4 weeks, the females tunnel 2 to 5 inches into the soil and deposit 30 to 40 eggs.

Small larvae hatch and develop through three stages (instar), with the first two lasting about three weeks. The third stage larva has a voracious appetite and actively feeds until cool weather arrives and remains in the soil until the following spring. The pupal stage follows the third instar and is the life stage during which the white grub transforms into the adult beetle. The pupal stage does not feed or move through the soil. White grubs pupate 3 to 6 inches deep in the soil for about three weeks before emerging to mate. There is one generation per year, but in North Texas, development may take two years.

Damage

Southern masked chafer (Cyclocephala lurida) Bland, 1863
Ward Upham, Kansas State University, Bugwood.org

The most severe injury is in the fall and spring as large grubs (third stage or instar) feed on roots. When the roots of plants are chewed, they cannot absorb the water and nutrients they need. Grubs may cause severe injury to lawns, especially warm-season grasses like Bermuda, St. Augustine, and Zoysia. The grass does not thrive and will likely dry out, especially in hot weather. Severely damaged grass can be "rolled up" like a carpet.

Grubs also feed on the roots of ornamentals, vegetables, and weeds. In agriculture, they are important pests of forage, corn, sorghum, and sugarcane crops. White grubs are frequently seen while tilling or sifting the soil.

A few grubworms can be tolerated, but severe infestations may need treatment. Signs of severely infested lawns and gardens:

- Soil infested with grubworms may feel spongy when walked on
- Irregularly shaped areas of weakened or dying grass
- Brown or gray patches may form on your lawn
- Veggies, flowers, or grasses may suddenly die
- Plants may have wilting leaves
- Moles, raccoons, skunks, and armadillos are attracted to infested lawns

Control

Sampling

You can avoid spending money on grub control and reduce pesticide use by determining the number of grubs in your lawn. Most lawns and gardens can tolerate a few grubworms before significant damage is done. If you notice significant damage, sample several locations across your lawn or garden to determine an average number. To sample for white grubs, dig about 6 inches deep into an area of soil, such as one sq ft in several locations across the lawn area, and count the number of grubs. More than 3 to 4 white grubs per square foot indicate action is needed.

Non-chemical controls

- Highly organic soils and soils with thick thatch are more vulnerable to attack. Keep irrigation and fertilization to the minimum required.
- Beneficial nematodes are tiny worms that attack white grubs and other soil-inhabiting insects. If you prefer not to use pesticides, these are an environmentally sound alternative.
- According to one study, repeatedly walking over heavily infested lawns with spiked sandals (sold for aerating lawns) may reduce grub populations by up to 50%.
- Songbirds, chickens, and guineas love to eat them and may help keep grubworm populations down.
- Milky spore disease *(Bacillus popilliae)* is often recommended for white grub (Japanese beetle) control in other regions of the U.S.; however, it has not been shown to be effective against Texas lawn-infesting white grubs.

Pesticides Usage

Proper timing and chemical application are critical to suppressing white grubs. Treatments must be applied early enough to kill the smaller larvae. Once white grubs reach the third instar life stage, they are more challenging to control. New white grub insecticides are more persistent and less toxic to beneficial arthropods and earthworms.

May-June beetles (Genus Phyllophaga) Harris 1827 Whitney Cranshaw, Colorado State University, Bugwood.org (CC BY 3.0 US)

The best time for insecticide treatment is approximately five weeks after peak adult emergence, as the eggs have hatched and the grubworms are small during the first larval stages. Treatment of smaller grubs prevents unnecessary damage to lawns and increases the chances that the chemical will be effective. Watering the lawn thoroughly just before and after treatment helps improve the effectiveness of Insecticides.

Routine, “preventative” insecticide applications to lawns are not recommended. Overuse of insecticide applications sometimes creates more problems than they solve. They can have detrimental effects on beneficial organisms.
Unnecessary applications can increase the risk of insecticide resistance developing among pest populations.

Some insecticides can be toxic to pets, birds, and other wildlife. Always follow label directions and use pesticides safely.

Resources

"Grubworm, White grub," Texas AgriLife Extension (accessed 14 August 2023) https://texasinsects.tamu.edu/grubworm-white-grubs

"Grubs, Landscape IPM," Texas A&M AgriLife Extension, (accessed 14 August 2023) https://landscapeipm.tamu.edu/ipm-for-turfgrass/pests-turfgrass/grubs

Merchant, Michael; Biles, Stephen; Mott, Dale; "White Grubs in Texas Turfgrass", Texas A&M University, 2007, (accessed 14 August 2023) https://extensionentomology.tamu.edu/publications/white-grubs-in-texas-turfgrass/

"Sampling Methods, Landscape IPM," Texas A&M AgriLife Extension, (accessed 14 August 2023) https://landscapeipm.tamu.edu/what-is-ipm/ipm-concepts/sampling-methods