



## Lawn Insects

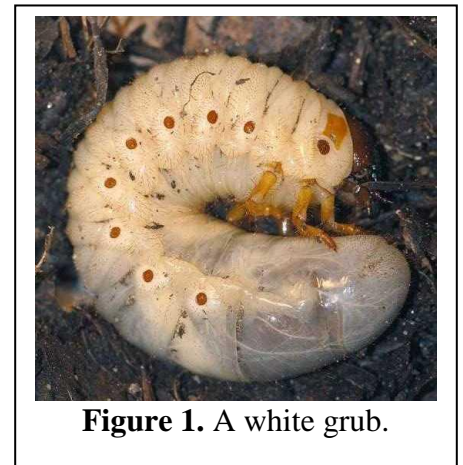
**Introduction:** Many insects attack our lawn grasses. Most of them are minor pests and their damage is usually overlooked. A few, however, can cause extensive serious damage, sometimes-killing large areas of grass. Our most common pests in home lawns on Long Island are white grubs and chinch bugs. Grubs feed on the roots of grasses, chinch bugs feed on above ground grass parts.

Well-managed turf is able to withstand more insects without showing damage than turf that is stressed. Providing adequate soil moisture and reducing soil compaction, along with proper fertilization, mowing and soil pH can do much to combat insect pests.

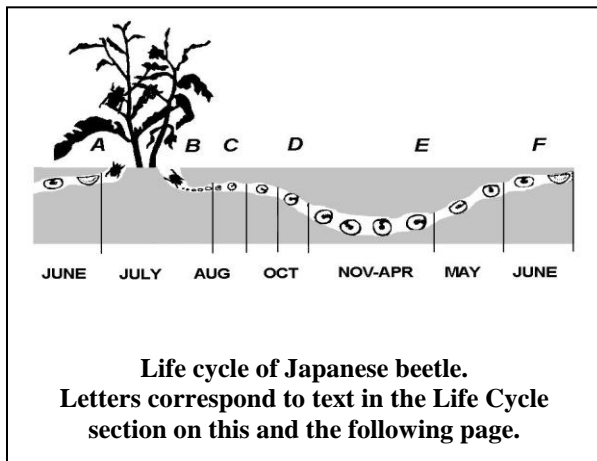
### White Grubs

White grubs are immature scarab beetles (for example: European chafers, Japanese beetles, and Oriental beetles). Grubs (**Figure 1**) are shaped like the letter “C”, off white in color with a brownish head and vary in size from  $\frac{1}{4}$  to  $\frac{3}{4}$  inch in length depending on the species and the time of the year you sample. Knowing the life cycle of grubs is the key to determining whether you have a problem, what to do about it, and when to do it. Grubs live in the soil, feeding on plant roots, so you may not be aware of them until you see damage. By considering a grub’s life cycle, you can anticipate problems before your lawn is ruined.

**Life Cycle:** The biology of the Japanese beetle is typical of most grubs encountered in New York State and is explained below. The letters correspond to those in the life cycle diagram below.



**Figure 1.** A white grub.



**A.** In late June and early July, Japanese beetle adults emerge from the ground and begin to search for food and mates. The adults can fly as far as a mile and feed on a multitude of plants; their favorites include roses, grapes, and linden trees. Other scarab beetles may go unnoticed at this time because they are not attacking ornamental plants.

**B.** In July, female beetles spend 2–3 weeks laying up to 60 eggs in the soil. Depending on soil moisture and temperature, eggs hatch about 2 weeks later. These first-stage (“first-instar”) grubs feed on grass roots for most of August. The grubs are small, feeding close to the surface, and vulnerable to biological and chemical insecticides at this time. Control high populations at this stage, before feeding on turf roots is noticeable.

**C.** From late August through October (depending on your climate) grubs molt into a second and then a third stage. As they grow, grubs consume more roots. Damaged turf often appears now.

**D.** As temperatures drop in autumn, grubs move down in the soil. They overwinter as third-instar grubs below the frost line.

**E.** In the spring, they move up in the soil to feed on roots for a very short time. (Most of the lawn damage seen in the spring is a result of fall feeding, not spring feeding.)

**F.** In late spring grubs stop feeding and turn into pupae that are resistant to insecticides. In late June or early July, beetles emerge from the pupae and crawl out of the soil, completing the cycle.

**Symptoms of damage:** Severe grub damage in a lawn appears as large, irregular sections of brown turf that detach from the soil without effort. Unlike turf damaged by drought or excessive fertilizer, the turf peels away like a carpet being rolled up.

For most of the year, however, grubs are out of sight and out of mind. They feed on grass roots in your lawn and are usually noticed only when dead and damaged areas appear.

**How to determine if a grub problem exists:** You can prevent losses by locating high grub populations before they cause damage by *sampling* lawn areas. This sampling is referred to as “scouting”.

*When to sample:* Seek out grubs in early August on Long Island, early in a grub’s life cycle while they are small and less capable of seriously damaging your lawn. Early sampling, while your lawn looks healthy increases your chances of being effective and decreases the possibility that skunks and other animals will tunnel your lawn, feeding on grubs.

*Where to sample:* Begin by sketching a simple map of your property. Now think of areas that are important to you from a visual or aesthetic standpoint. The front lawn, where visitors enter? Near the back patio? Mark these high-priority areas with X’s that translate to about 10 feet apart. These will be your sampling sites. Consider areas with a history of grub damage and mark these areas, too. Mark low-priority areas with X’s every 20–30 feet. You probably won’t need to sample or treat remaining areas.

Mount your map on a clipboard and grab a full watering can, a piece of cardboard, and either a bulb planter or a shovel, and go to one of the sampling sites marked on your map. A cup cutter used on golf courses can also be used but this is an expensive item and only practical for lawn care professionals.

*How to sample: (Method 1) bulb planter or cup cutter:* Use a bulb planter to remove a core of soil and grass. Examine the contents on a piece of cardboard. The area is approximately 1/10 of a square foot of sod. Jot down the number of grubs on your map, and then multiply it by 10 for the number of grubs per square foot. Replace the soil and sod, and water thoroughly, then move to your next sampling site.

**(Method 2) shovel:** If you have time to take only a few samples, try this method. Using a garden shovel or spade, cut three sides of a 12-inch square. Grab hold of the open edges and peel back the turf like a carpet, towards the attached side. Look for “C”-shaped grubs on the newly exposed soil and under the sod mat. Count them and make a note on your map. Replace the sod, water thoroughly, and then move to your next sampling site.

Scouting for grubs helps you decide whether to treat—but first, watch for natural controls.

**Know your grubs:** Although all grubs cause similar damage, the treatment you choose should correspond to the species. Homeowners can have their grubs identified at Cornell Cooperative Extension (CCE) – Suffolk County. Contact our office for information on how to submit insect specimens for identification. Lawn care professionals should learn how to identify grubs and can consult with CCE staff for training. Knowing the species helps you pinpoint effective strategies that will work in your climate.

**How many grubs are needed to cause a problem:** How many grubs are too many? Research in upstate New York has shown that *only 20 percent of home lawns and golf course fairways require treatment*. Here’s a guide to treatment thresholds for European chafers, Japanese beetles, and Oriental beetles. The most common grubs in home lawns on Long Island are Oriental beetle grubs. Numbers are based on grubs/sq.ft.

*0-5 grubs: rest easy:* Fewer than five grubs per square foot is a low population. You don’t need to treat.

*6-9 grubs: think about your lawn:* Is your grass dense, with a healthy, robust root system? If so, it can probably withstand grub populations of 6-9 per square foot, or more. On the other hand, if animals such as skunks, raccoons, birds, and moles are digging up the turf to feed on the grubs and this bothers you, consider treating highly populated areas.

*10 or more: they may cause damage:* Ten or more grubs per square foot will likely cause damage, especially if the lawn is otherwise stressed. In most circumstances, you'd be justified treating where populations are this high. Several weeks after treating, sample in a few locations to determine whether treatments were effective.

**Management:** Many characteristics of a lawn determine how well grass grows. You can, however, help your lawn to compensate for loss of roots by watering and mowing it regularly and reseeding damaged areas.

*Natural enemies kill grubs:* In the soil, microscopic worms known as nematodes live and breed. Some nematodes infect and kill grubs, thereby reducing populations. You can also purchase and release nematodes that will kill grubs, if used properly. Beneficial nematodes of the species *Heterorhabditis bacteriophora* are a non-chemical product that can be used on young grubs. These nematodes should be applied during August to early September. Apply to moist soil in the evening; water the lawn after the application.

Milky disease spore powder may be of benefit for Japanese beetle grub control. It is not effective against other grub species such as the Oriental beetle, which is the grub species most often encountered in lawns on Long Island. It may take several years to have any effect. The soil must be moist with soil temperatures greater than 70° F. and grubs must be present to maintain and spread the disease. Milky spore may be useful on large, marginal, or low-value turf areas. Other natural diseases and parasites occur in the soil. If you see sick or dying grubs, it may be best to let nature do its work.

*When to treat for grubs in a lawn:* You might be tempted to treat grubs in the spring, when you see last fall's damage—but *most spring treatments are a waste of time and money*. The grubs have already damaged your lawn and are fairly resistant to insecticides at this time. Furthermore, even if you could eradicate them, summer will bring a new batch of beetles to your lawn.

In the late summer, sample for grubs as described earlier. *If you decide to treat, do so in the late summer (last week in July to mid-August on Long Island for Oriental beetle grubs, but several weeks later would not cause major problems)* when grubs are susceptible to both biological and most chemical insecticides and haven't had a chance to cause severe damage. Treat only the areas where grub populations exceed the suggested thresholds, in areas of your lawn that are aesthetically important.

*Registered insecticides for homeowner use on lawns include: carbaryl and trichlorfon.* Apply when a damaging population is confirmed. Treat when soil is moist, and water in immediately following treatments.

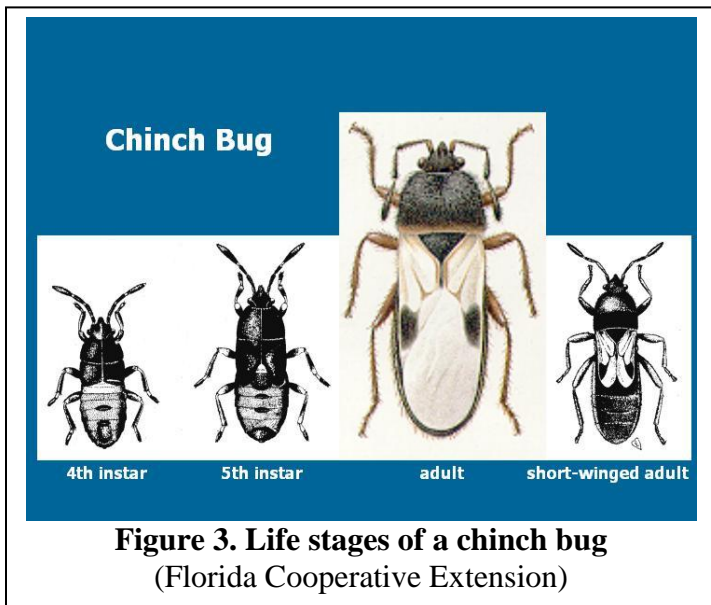
## Chinch Bugs

**Symptoms of damage:** Chinch bugs (**Figure 2**) injure grasses by puncturing the stems and sucking out the plant juices. Injury first appears as a coppery colored area closely resembling drought or sunscald injury. If the infestations are severe, the grass is killed and only clover and other non-grass weeds, which are not attacked, survive. Chinch bugs normally become a problem after June, most often during July, August and September when we have warmer temperatures. Some varieties of grasses appear to be more tolerant of chinch bug feeding injury than other grasses.

**Description and life cycle:** The hairy chinch bug is our common species. The adults (**Figure 2.**) are black with white wings folded over the body, about 1/5 inch in length. The chinch bug passes through five growth stages (instars) (**Figure 3.**) The 1st and 2nd instars are bright red with a white band across the 1st two abdominal segments, the 3rd instar is orange, 4th orange-brown, and the 5th blackish. Chinch bugs overwinter as adults in sheltered places, under shrubs or along foundation walls of homes. Females lay eggs in the early summer, and on Long Island where there may be two generations



**Figure 2.** Chinch bug adults (Beverly Sparks, UGA)



egg laying occurs again in late July or early August.

**How to determine if chinch bugs exist:** Chinch bug injury may be distinguished from other pest damage by careful examination about the crowns of the grass plants revealing the presence of the insects. The outer margin of the injured area is a good place to look to find the bugs. Other methods of detecting the presence of the bugs include the following: **(1)** Water small areas heavily and then cover them with a white cloth. Within a short period of time, the bugs will crawl up the grass blades and cling to the under surface of the cloth where they can be easily seen by turning the cloth over. **(2)** Use a large can with both ends open, drive it into the soil a few inches, and fill with water - adults and nymphs should float to the surface within 10 to 20 minutes.

**Management:** If you determine by the sampling

methods described above that 15-20 nymphs (instars) are present per square foot you may want to consider treatment with insecticides or you may be able to reduce the damage by keeping lawns watered. If more than 25 bugs per square foot of turf are found this may warrant control. **Avoid drought.** Chinch bugs survive best in lawns with thatch problems. For long-term management, select grass mixes containing **endophytic grasses** or other **resistant grasses**.

*Insecticide controls for homeowners:* **bifenthrin, carbaryl, or cyfluthrin** may be used. Water the lawn before treatment. A second application may be necessary 2-3 weeks later. Granular materials should be watered in immediately after application.

Information on grubs obtained from *Grubs in your lawn? A guide for lawn care professionals and homeowners*, IPM No. 412, NYS IPM Program, Geneva, NY 4/01; Information on chinch bugs obtained from *Lawn Insects*, by Carolyn Klass, Senior Extension Associate, Cornell University, 4/91 revised.

Pesticide and management recommendations obtained from: *Part I Guide to Pest Management around the Home, Cultural Methods* and *Part II -- Pest Management around the Home, 2009-2010 Pesticide Guidelines*, Miscellaneous Bulletins 139S74I and 139S74II. Contact our office for information on ordering copies; online versions of these publications are available at <http://ipmguidelines.org/Home/>.

The Pesticide Management Education Program (PMEP), in cooperation with the New York State Department of Environmental Conservation (NYSDEC), maintains a web site with a searchable database for pesticide products currently registered in New York State. Individuals who have Internet access can locate currently registered products containing the active ingredients suggested above at <http://pims.psur.cornell.edu/> (NYS PIMS).

**This publication contains pesticide recommendations. Changes in pesticide regulations occur constantly and human errors are still possible. Some materials mentioned may no longer be available, and some uses may no longer be legal. All pesticides distributed, sold or applied in New York State must be registered with the New York State Department of Environmental Conservation (NYSDEC). Questions concerning the legality and/or registration status for pesticide use in New York State should be directed to the appropriate Cornell Cooperative Extension Specialist or your regional NYSDEC office. Read the label before applying any pesticide.**

TK: 1/2010 AW: 1/2012