

## **White Grub Damage on Lawns**

White grub damage appears as dead patches (often distressingly large) on lawn areas, and is most severe in the fall and spring. Damaged areas will feel soft and spongy when you walk on them before the grass actually dies. The affected areas lift easily because the roots of the grasses have been eaten by grubs. You will often find the C-shaped white grubs under the areas that you lift. Five or more grubs per 0.1 m<sup>2</sup> is enough to seriously damage lawns that are not irrigated. Raccoons, skunks and other small mammals may cause secondary damage on infested lawns by digging up turf while searching for a meal of grubs.

## **WHITE GRUBS- LIFE HISTORY**

Three different species of white grub infest lawns in the Ottawa area. They are the immature stage (larvae) of scarab beetles; the June Beetle, the European Chafer and the Japanese Beetle. The grubs are C-shaped, with soft, wrinkled white bodies, a brown or tan head and 6 brown spiny legs and can range in size from 3 mm when newly hatched to 2 to 4 cm when fully grown. They are found in the soil, feeding on the roots of grasses, weeds or almost any plant root material that they encounter, however the timing of biological events for each species differs, and this may affect how and when you act to manage these pests .

June beetles require 3 years to complete their life cycle. Adults are large brown beetles which feed on the upper leaves of deciduous trees in late May or early June. They are common visitors at porch lights and on window screens on early summer evenings. They lay their eggs in the soil in grassy or weedy areas. These eggs hatch in a few weeks (mid-June), and larvae begin feeding on roots and decaying organic material. When the soil temperature cools in the fall, the larvae cease feeding and move below the frost line for the winter. In the spring, when the soil

warms, larvae return to the root zone and resume feeding. When fall arrives, the 2<sup>nd</sup> year larvae move below the frost line for the winter. The third spring, June beetle larvae move to grass roots to feed for a short time, then pupate. Adults emerge from the soil the following spring. In infested areas, one, two and three year old grubs will be present together.

European Chafers develop from egg to adult beetle in only 1 year. The adult beetle looks very similar to a June Beetle, but is present and laying eggs in late June and early July, about the time that hybrid tea roses are in full bloom. Their larvae begin feeding immediately following hatch as long as moisture is present in the root zone. They reach their full size by the end of September however can remain in the root zone feeding until November or December. Then, they move below the frost line for the winter, and migrate back to grass roots to resume feeding in early spring of the following year, even before the snow melts. They pupate in the soil by mid to late May (approximately when Bridal Wreath Spirea is at full bloom).

The Japanese Beetle is a smaller scarab beetle with a metallic green body and copper coloured wing covers. If you look closely, you will see six tufts of white hairs along the sides of the abdomen. Beetles lay eggs in late July and early August. Larvae feed on roots from hatch until October when they move deep in the soil for the winter. The following spring, grubs feed until mid to late May and then pupate in the soil. Adults emerge from late June until July, and cause severe damage on foliage and fruit of ornamental trees, shrubs and vines as well as on vegetables and fruits.

Fig. 1 Approximate Time for White Grub Feeding in Ottawa

Insect		Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
June Beetle	Yr1												
	Yr2												
	Yr3												
European Chafer	Yr1												
Japanese Beetle	yr1												

HOW DO I KNOW WHICH GRUB I AM DEALING WITH?

Larvae of June Beetle, European Chafer and Japanese Beetle are very similar in appearance. They can be distinguished by the pattern of spines on the underside of the tip of the grub’s abdomen. On the June Beetle, the spines are in two lines that converge at both ends. On the European Chafer, the spines form two lines that diverge at the top end. On the Japanese Beetle the spines form a distinctive ‘V’ shape. The Ministry of Agriculture, Food and Rural Affairs Fact Sheet ‘Grubs on Lawns’ illustrates this very well.

(<http://www.gov.ov.ca/OMAFRA/english/crops/facts/97-023.htm>)

## NOW THAT I KNOW WHAT I'M DEALING WITH, HOW DO I MANAGE WHITE GRUBS, WITHOUT RESORTING TO CHEMICALS?

- ◆ Healthy, vigorous lawns are able to tolerate grub feeding. They have a larger root system, and root tissue lost to grub feeding can be replaced. Correct cultural practices and adequate irrigation of turf areas (at least 2.5 cm per week) will minimize damage to grass even if grubs are present.
  
- ◆ Adult beetles prefer to lay their eggs into grass areas. Replace damaged turf with other types of plants. A variety of beautiful ground covers are available at local garden centres. (NOTE: If you choose to replant damaged areas of lawn with grass, endophyte enhanced varieties resist attack by insects that feed on the blades of grasses. They do not resist attack by root feeding white grubs).
  
- ◆ Parasitic nematodes are widely available for use on lawns to manage the common species of white grub. They are living organisms and must be handled with care when being applied to lawns.
  - Keep them cool before application (they should be refrigerated at the point of purchase and at home until they are used).
  - Do not expose nematodes to ultraviolet light. Apply them on overcast days, or in the evening.
  - Irrigate the lawn before applying nematodes
  - The soil temperature must be at least 15°C before nematodes are applied.

- Nematodes are mixed with water, and applied to lawns using a hose-end or back-pack sprayer. Do not let the nematodes sit for more than 2 hours after they have been mixed with water.
  - Nematodes do not move large distances on their own so they must be moved to the root zone where grubs are feeding. Water treated areas thoroughly after application.
  - Apply nematodes in the late summer or early fall when grubs are small, and more easily killed.
  - Read the package that the nematodes are purchased in before applying them onto your lawn. It should include directions for handling these creatures and rates of application.
- ◆ Starlings and Blackbirds feed on white grubs without significantly damaging turf. Encourage these beneficials by providing bird houses in your yard.
- ◆ Traps are commercially available for adult Japanese Beetles. These use a sexual attractant and/or a sweet smelling lure ('Floralure') as bait. These do not capture all the beetles that they attract. Do not place these traps in your garden, or near plants that you are trying to protect.

For more information about white grubs go to the following web sites:

<http://www.gov.ov.ca/OMAFRA/english/crops/facts/97-023.htm>

<http://www.uoguelph.ca/pdc/Factsheets/Insect/grub.htm>