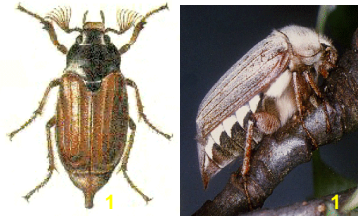


ROLAWN CHAFER GRUB TECHNICAL INFORMATION SHEET AND TERMS & CONDITIONS OF SALE.

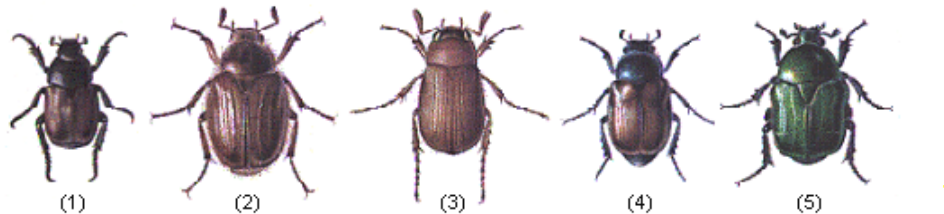
Chafers are beetles (order Coleoptera), and belong to the same family as the scarab or dung beetles (Scarabaeidae).

The adults



At 25 - 35mm long the Cockchafer or 'Maybug' (*Melolontha melolontha*) is one of the UK's most impressive insects within this group - the adult beetle (shown left) flies at night and often crashes into lighted windows during warm early summer evenings.

In Britain and other parts of Europe, several species of chafer beetles can be serious garden and agricultural pests:



(1) Welsh chafer (*Hoplia philanthis*), 8-9 mm long; (2) Summer chafer (*Amphimallon solstitialis*), 14-18 mm long; (3) Brown chafer (*Serica brunnea*), 8-10 mm long; (4) Garden chafer (*Phyllopertha horticola*), 9-11 mm long; (5) Rose chafer (*Cetonia aurata*), 14-20 mm long.

The two most commonly found chafers affecting turf in the UK are;

The garden chafer, *Phyllopertha horticola* (4), and the welsh chafer, *Hoplia philanthis* (1). *Hoplia* is particularly common in sandy soils.

Adults of *P. horticola* have a metallic green head and thorax with light brown wing cases. They are about 9 mm long. *H. philanthis* is a similar size with a black head and thorax and reddish brown wing cases.

Adults feed on leaves, buds and flowers of deciduous trees and shrubs but rarely cause serious damage in the UK.

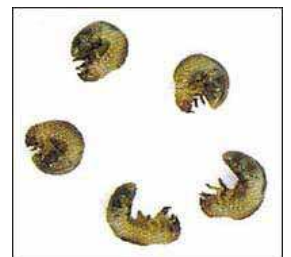
The eggs

Adults lay shiny, milky white oval shaped eggs approximately 0.75 x 0.48mm in size in compacted cells of soil. The eggs absorb water and swell in size to 2 – 2.7 mm becoming a dull grey in colour.

The larvae

The larvae have white bodies curved in a letter C shape, light brown heads, with three pairs of legs. They are bigger than the adults and if straightened out would be up to 18 mm long (40-45mm for the cockchafer). There are three larval stages.

Larvae (except those of the Rose chafer) feed on the roots of plants and are particularly important pests of grasses and turf amenity areas and lawns. They are often found lying just below the soil surface.



The grubs sometimes attack vegetables and other garden plants such as lettuce, raspberry, strawberry and young ornamental trees.

Damage symptoms

Heavily infested turf typically shows symptoms similar to those of drought stress with poorly growing patches first discolouring grey green and then turning yellow or brown in dry weather. The tunnelling activity of the larvae can cause the turf to feel spongy underfoot. Grubs tend to cause significant damage from Autumn to Spring by which time the larvae are becoming fully grown.



Predatory mammals may cause secondary damage by digging up turf in their search for an easy meal consisting of white grubs.

The life cycle

Life cycle of the beetle grub varies depending on the beetle species and local climatic conditions but can be generalised as follows;

Adult beetles emerge from their pupal cases and begin to fly in large numbers (in heavily infested areas) at dusk from late May to June. Adults fly to nearby trees and shrubs where they mate on mass until dawn at which point the adults return to the soil. Climate influences this behaviour with less flight and mating taking place on cool and/or rainy nights. Several mating flights may be made but eventually the females lay 15-20 eggs in a 2-5 day period. Eggs are laid about 15cm deep in the turf and these hatch in about 2 weeks. If moisture levels are good the larvae move up toward the surface and begin to feed on plant roots. In drier conditions they may remain lower down in the soil. Larvae feed until around late September when they move deeper into the soil where they pass the winter. Pupation then takes place the following Spring (around mid May) normally 5-15cm below the surface.

Some species of chafer grubs may feed below ground for 2-3 years before changing into adult beetles. This means that larvae may be found at any time of the year though there will be higher numbers in Spring and Autumn. Examples are *Phyllophaga* spp. And *Popillia japonica*. Geographical location will also influence this.

Monitoring and thresholds

Adult chafers can be caught and monitored using light traps from the start to middle of May.

Larvae are best sampled by digging up or peeling back turf in sections of 1 square metre. Populations of 10-15 grubs per square metre have been quoted as causing significant damage in the Autumn months whereas levels of 6 grubs per square metre may be compensated for by extra applications of water and fertiliser. The best time to monitor is in August.

ROLAWN CHAFER GRUB : *Heterorhabditis* sp. (insect-parasitic nematode)

Unit sizes:	10 million treats 20 square metres	£14.99
	50 million treats 100 square metres	£39.99

Target Pests

Soil dwelling and plant boring larvae are controlled well by *Heterorhabditis* sp.

ROLAWN CHAFER GRUB is known to be effective against the following chafer grubs;

Welsh chafer (*Hoplia philanthus*)
 Japanese beetle (*Popillia japonica*)
 European Chafer (*Rhizotrogus majalis*)
 Asiatic Garden Beetle (*Maladera castanea*)
 May/June beetles (*Phyllophaga* spp.)

Key points affecting efficacy

Temperature : nematodes are effective 14 to 33°C (57 - 91°F)

- At lower night-time temperatures, development slows down or ceases, but resumes when daytime soil temperatures rise again.

Host life stage : Efficacy is best against 2nd or 3rd larval stages of the white grubs

- Success rate largely depends on the nematode reaching the target at the right stage.
- Application is recommended from late July until October. In severe cases a second application may be required.
- Application after October is not advisable because larvae will have moved deeper into the soil to pass the winter.

Application time : UV light kills nematodes

Avoid spraying nematodes in direct sunlight.

Chemical pesticides : Some chemical pesticides kill nematodes

- Use caution when treating other diseases and pests. Consult a side effects guide.

Moisture : Nematodes do not like dry conditions

- For optimal results, the ground surface should be moist. Sprinkle with water before application and keep the ground moist for two weeks after the application.

Application method of the nematodes

- Use a watering can or a hose end feeder
- Larger applications can use sprayers or irrigation equipment
- See pack for precise application instructions

Do not divide a package and/or use a part of it. The nematode distribution is not even throughout the package and using a part of it may result in a too low or too high dosage.

Application and dose

- Apply the solution immediately. If using a watering can do not use a fine rose where the material will get stuck in.
- Evenly spread the solution over the ground area to be treated. Continuous mixing should take place to prevent the nematodes sinking to the bottom (but also avoid excess tank agitation).
- Spray the whole mix in one application (don't let the mix stand overnight).
- Sprinkle the turf or soil with water again after the application to move the nematodes into the soil. A post-application drench that penetrates the ground to a depth of 0.25 to 0.65cm (0.10 to 0.25 inches) is sufficient.
- Keep the soil moist during the first two weeks after application.
- The very large species of Chafer like Cock Chafer will need several treatments as nematodes are not as effective on large grubs.

Storage and handling

- Store the product in a cool and dark place, ideally a refrigerator (36-43°F or 2-6°C).
- See the top of the package for the expiry date.
- Nematodes should be applied as soon as possible after receipt to ensure maximum performance.

Appearance

Larvae (third stage): size 0.6 mm
Other stages: develop inside host

Mode of action

The nematodes supplied actively search for an insect larva. Once a suitable larva is encountered nematodes enter the body cavity of the host via natural body openings and occasionally by direct penetration through the 'skin'. Once inside the larva the nematodes release a bacteria which multiplies rapidly. The bacteria convert the internal larval tissues of the larva into a kind of 'soup' that is readily eaten by the nematodes.

The larva dies within a few days due to blood poisoning caused by the bacteria.

The nematodes multiply and develop within the dead insect. As soon as the nematodes are in the infectious third stage, they leave the old host and start searching for new larvae. When there are no new hosts present, the nematode population will slowly decrease.

The nematodes supplied in ROLAWN CHAFER GRUB are completely safe to humans and animals.

Visual effect

Infected grubs change colour from white-beige to red-brown 2-4 days after application and become slimy. After a few weeks, dead larvae disintegrate completely and are difficult to find.

TERMS AND CONDITIONS OF SALE

Natural or biological control products must be used according to the Guidelines and Instructions given with them for effective results.

No guarantee of success can be given due to the variables involved with live insects or live material.

Some basic principles should always be followed when using these products;

- **Products should be applied and used as soon as possible after receipt. These products have a short shelf life.**
- **Products should only be applied when the conditions are suitable; this is based on temperatures and pest life cycles.**
- **Insect based products do not control pests immediately and should be given time to build up to levels that will combat pests.**
- **Repeat applications can be necessary depending on the product and pest pressure**
- **Natural predators and parasites are very sensitive to most chemical pesticides. Application of these should stop prior and during use of these products.**

Refunds or replacement product can only be given in the event of the product being damaged or defective upon receipt, provided complaints are lodged within 24 hours of delivery.