

B-Green[®] works towards a fast and efficient biological control of white grubs because *Heterorhabditis bacteriophora* actively searches and destroys beetle larvae in the soil. The most commonly occurring beetle larvae pests are *Phyllopertha horticola* (the garden chafer) which cause a lot of damage in grass fields and lawns.

GARDEN CHAFER (*Phyllopertha horticola*)

Biology

Adult garden chafers (*Phyllopertha horticola*) are 8-12 mm long and have red-brown slightly hairy wings with a dark edge. The neck shield is metallic green to shiny black. They appear, depending from season to season, in the months of May and June, therefore they are easily confused with June beetles. During the first night in which the adults are active, mating takes place. That same night the females crawl in the ground and dig to a depth of 10 to 25 cm to deposit their eggs. Approximately 85 % of the eggs are laid during the first night. After the first batch, they fly out in late morning. The typical low flights right above the grass surface are very characteristic for the garden chafer. During the flight period of three weeks they feed on buds and leaves of different broad-leaved cultures. This is called the period of ripening damage which is followed by a second session of egg laying. It can take place in a 3 to 4 km zone around the area of initial egg laying. When the flights get noticed, most of the eggs are already laid. This and the dispersal of adult beetles has the consequence that chemical control of adult garden chafers is impossible. 3 to 6 weeks after the first generation the first larvae appear. These have a brown head and a beige-white body. The young beetle larvae, also called white grubs, immediately begin to nourish themselves with humus-like material. During the second larval stage, they eat root hairs and when they reach the third stage they eat the roots of the lawn and other plants. This way the plant's moisture becomes strongly decreased and the damaged plants eventually die. The life span of the larval stages is 1 year while for other beetle larvae of the same family, like the summer chafer and the cockchafer, it could take respectively 2 and 4 years time. The larvae keep feeding until mid October. As soon as the temperature begins to drop in autumn, most of the

larvae move deeper in the soil to hibernate. If the temperature increases in spring, the white grubs pupate in April and from May they reappear as adult garden chafers.

Damage

In the period between July and September the damage can be so severe that entire parts of the lawn die. A well-trained eye can already recognize the place where the grubs are situated by the colour of the grass (less fresh, yellow/brown blades). From July it is obvious that the grass does not grow well on the infected places. It is not uncommon that with a heavy infestation, the turfs are so damaged that they come loose and it is possible to roll them up. Under the turf you find a mass of grubs, sometimes up to 100. When the grass endures a heavy drought period now as well, these severely damaged areas can completely scorch and die. In addition these grubs are the favoured food of moles, skunks and several bird species. The presence of these animals can lead to secondary damage in the grass field.

APPLICATION

B-Green[®] ensures a rapid and efficient control of the garden chafer on condition that:

- It is used curatively, this means that the larvae need to be present at the moment of treatment;
- The moisture of the soil is high enough and the soil temperature does not drop below 12°C 5 weeks after the treatment.

In practice this means that the time is right for an application from mid July till the end of September because grubs are just below the ground surface at this time.

METHOD OF ACTION

Heterorhabditis bacteriophora is able to rapidly and efficiently control the larvae of the garden chafer. Furthermore *Heterorhabditis bacteriophora* is also an ideal controller for other beetle species such as the vine weevil (*Otiorhynchus sulcatus*).

When the nematodes are introduced, they actively search for white grubs that are present in the root zone. The nematodes penetrate these larvae through natural body openings or directly through the body wall.

Once the larva is penetrated, bacteria that live in symbiosis with the nematodes are released. These bacteria transform host tissue into products which can be easily absorbed by the nematodes. The nematodes multiply in the grub and when this decomposes, the new generation of beneficial nematodes, looking for new victims, disperses.

Infected white grubs turn from white-beige to red-brown and the larva decomposes whereby it is difficult to find. The first grubs can be killed after 2 to 4 days after application.

For the best result it is important that the soil humidity is high and that the soil temperature does not drop below 12°C during 4 weeks after treatment.

PACKAGING

B-Green® is delivered as a gelformula. Depending on the packaging, it contains 5, 50 or 500 million juvenile nematodes. By mixing with water, the nematodes are kept in suspension. This suspension has to be spread over the surface you want to treat.

100 m² ground surface can be treated with 1 B-Green® package of 50 million nematodes. The larger package of 500 million nematodes, will treat 1000 m².

ADVANTAGES

- **Controls the garden chafer very fast in a curative way;**
- **Practical and easy to use;**
- **Can be introduced in combination with other biological or integrated systems;**
- ***Heterorhabditis bacteriophora* naturally occurs in Europe and North-America;**
- **Has been successfully introduced for many years;**
- **No problems with resistance;**
- **Completely safe for man, animal and plant;**
- **No protective clothing required during application.**