

# European Chafer

August 2023

## A Pest Increasing its Range in British Columbia

The European Chafer, *Rhizotrogus majalis*, is a serious pest of turf, horticulture, and field crops in Eastern North America. In 2001 it was found in New Westminster, British Columbia, in lawns and boulevards. It is slowly spreading and is now present throughout Vancouver, Burnaby, and Coquitlam. It has been confirmed in east Richmond (2010) and Delta (2007), and Surrey, and is spreading in these regions. In December 2018, European Chafer was confirmed one location in the city of Abbotsford, followed by confirmation in more areas of Abbotsford in 2019 as well as several locations in Mission. On Vancouver Island, European Chafer is confirmed in Nanaimo. The pest has only been observed in urban areas and is not yet known to be present in agriculture lands of British Columbia, however, detections have been made adjacent to fields in Abbotsford and Richmond in 2019. In 2023, European Chafer was confirmed in Revelstoke. This is the first confirmed establishment in BC's interior.

## Description

The adult beetle (Figure 1) is a tan coloured medium sized scarab beetle (12 mm long). The larvae, or grubs (Figures 2, 4, 5), have a C-shaped body and brown head. Mature chafer grubs are up to 25 mm long, significantly smaller than mature Ten-lined June beetle grubs, which can be 5 cm long. A microscope is required to confidently identify the grubs to species based on hair patterns on the raster (tail). There are several similar beetle species present in British Columbia which can be confused with European Chafer larvae or adults. These include the Ten-lined June beetle (*Polyphylla decemlineata*) and other June beetles, *Phyllophaga* species in the Scarabaeidae family. Native scarab beetles can be plant pests but don't tend to cause the extreme and rapid damage to turf that European Chafer causes. The [Japanese beetle](#) (*Popillia japonica*) was detected in the False Creek area of Vancouver in 2017, and eradication efforts are underway in Metro Vancouver. Its grubs can also severely damage turf.

## Biology

The European Chafer completes a life cycle in one year. Eggs hatch around mid-July, and the grubs moult twice over 8 weeks. The mature grubs thrive in moist conditions and feed throughout the fall. During the winter they dig down during periods of freezing conditions, but otherwise remain within



Figure 1. European Chafer adult beetles



Figure 2. European Chafer larval grub



Figure 3. European Chafer damage to turf

5 cm of the surface. They feed in the spring until April when they become pupae. Adults emerge in June, fly to nearby tall trees to mate, and subsequently females deposit up to 50 eggs each in exposed soil in nearby turf areas.



Figure 4. European Chafer grubs in turf



Figure 5. European Chafer larvae

## Damage

The grubs are the damaging stage. They feed on all types of grass and, if numerous and food is scarce, may move into vegetable or fruit plantings to feed on corn, potatoes, blueberries, strawberries, conifers, and other crops. European chafer grubs prefer to feed on fibrous roots, and can damage ornamental and nursery plants by reducing their fibrous root system. Most of the damage is done by the third (final) instar grubs in the fall and early spring, but damage can be masked by the abundant moisture at these times. Drier weather can quickly result in the appearance of brown, dying patches in turf or other crops. Short, stressed, south facing turf shows damage more readily than healthy lush turf. Considerable damage to turf can occur in the fall and winter from animals, including skunks, racoons, and birds digging up the grass to feed on the larger grubs (Figure 6). In June, the adult beetles are active at dusk and can be seen clumsily walking across lawns and flying up into trees in groups, but adults do not cause damage.

## Monitoring

To check for grubs, cut 3 sides of a 30 by 30 cm piece of sod to a depth of 5 cm, and fold it back to count the grubs. Generally if more than 20 grubs are found, control is warranted. Turf peels back easily if it is heavily infested, as the grubs have eaten off the roots. Check under dead or dying patches of turf, or where there has been damage to turf by vertebrates (mammals, birds). Beetles can be easily spotted while flying around tall trees in June. They can be mistaken for a swarm of bees, as they sound somewhat like buzzing bees when they fly and are approximately the same size.

## Management

Healthy, vigorous, well-irrigated turf can withstand low levels of grub feeding. Mow at 6-9 cm height, as taller turf is less preferred by egg-laying female beetles, and is more drought-tolerant. Although birds and mammals feeding on larvae damages turf, it also helps decrease the pest population. Do not reseed until feeding is completed and grubs have pupated in the spring. Do not remove soil from infested areas, as chafer can be spread to new areas by movement of infested soil. Do not bring plants in from infested areas. Composting will not kill larvae.

There are some naturally occurring soil organisms that infect European Chafer larvae and make them sick or kill them, reducing their impact. However, these cannot be relied on to completely manage a chafer infestation.

## Treatments

Conventional larvacides, predatory nematodes, and microbial larvacides are available for grub control. All products work best if applied before egg laying or when grubs are small, from April until September. Ideal timing of application varies depending on the product and is outlined on the labels. Local studies show that *Heterorhabditis bacteriophora* is the best nematode choice (one trade name is Nemasys G) for suppression of the grub population. This nematode is a "cruiser" species that actively seeks out white grubs such as the European chafer, and quickly destroys them from the inside-out. Larvacides containing imidacloprid, clothianidin, chlorantraniliprole, and tetraniliprole are available in commercial formulations, which can only be applied by commercial applicators. One application of larvicide per year is usually adequate to control the pest.



Figure 6: Dying turf from larvae feeding and damage caused by vertebrates (crows, racoons, or skunks) digging out grubs

A new microbial larvicide that suppresses pests such as European Chafer is now registered and available in Canada. The active ingredient is *Bacillus thuringiensis* subsp. *galleriae*, which kills larvae or beetles when they eat it. It comes in commercial formulations which need to be applied by a commercial applicator. There are domestic formulations that are available at some garden centers which homeowners can purchase and apply. One or two applications per year may be needed. For use of any pesticides, check with your municipality to ensure you are aware of local pesticide use bylaws and recommendations in addition to provincial and federal regulations.

Larvacides (both conventional or microbial) or nematodes can be applied to warm moist soil when the grubs are active. Do not apply to frozen, cold, or dry soil. Before applying a treatment, remove excessive thatch and irrigate to a depth of 2-5 cm if the soil is dry. For both larvacides and nematodes, it is important to irrigate or 'water in' after treatment to move the product into the root zone. If hiring a commercial applicator to apply either, check with the applicator to determine if you need to irrigate after the treatment, and how much water to apply.

If you have an ongoing problem with European chafer, plan to treat for larvae each year. There are commercial lawn care companies that can be hired to help manage the issue. Alternatively, remove turf from chafer-prone areas and replace with an alternative landscape feature.

## Further Information:

- [Grubs in Lawns, Ontario Ministry of Agriculture](#)