BIGGA

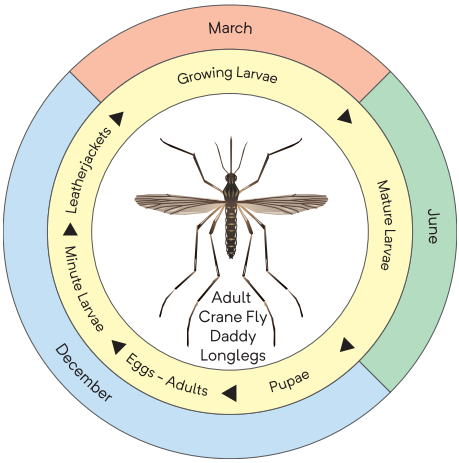
Tearing up the turf

Why you may be seeing damage around your golf course

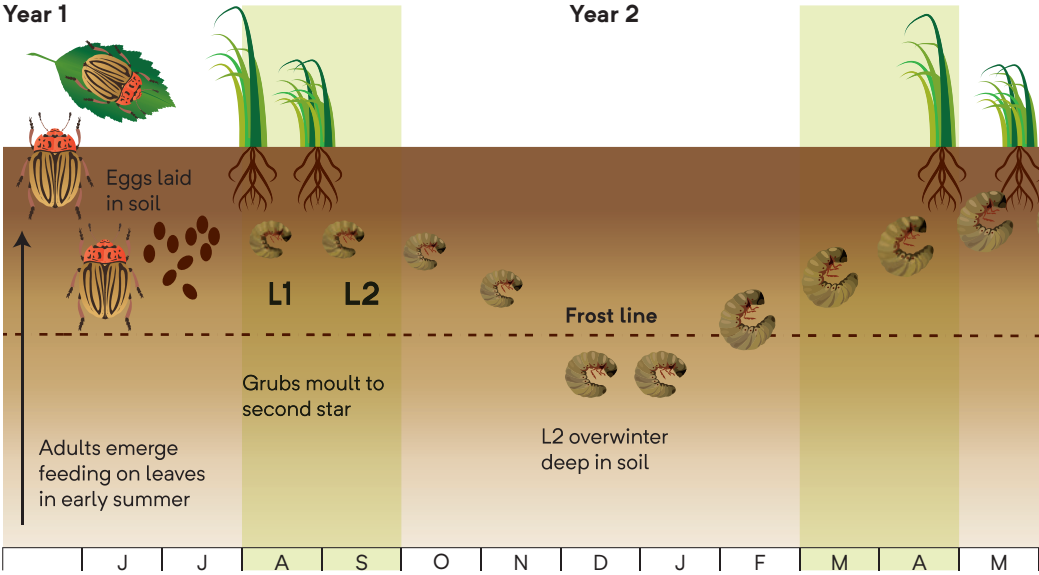
What's happening to our fairways? Why have we areas of damaged and turned over turf? What has caused the holes and scrapes on the approaches?

Fairways, tees and greens can all provide a habitat for a wide range of insect species. Most of these insects are very beneficial to the turf ecosystem. However, some, such as chafer (May bug) and crane fly (leatherjacket or daddy longlegs) have larvae which overwinter in the soil and eat the roots of grass. Crane fly are often seen on the wing in August and September. The adults seek out suitable grassland to lay eggs. The crane fly, in a natural environment, prefers grazed grassland. On the golf course we provide the equivalent, but call it 'fairways, tees and greens'. This shorter, managed grass provides the crane

Growth cycle of a Crane Fly



Welsh Chafer – Two Year Life Cycle



fly with what it sees as an ideal place to lay eggs. The eggs develop into larvae after a couple of weeks. The larvae then spread down into the soil profile, grazing on the grass roots.

Chafer (May bug) are slightly more complex. They tend to prefer light sandy soils, so for many golf clubs are not a problem. There are four common species of chafer in the UK: garden chafer, summer chafer, Welsh chafer and cock chafer.

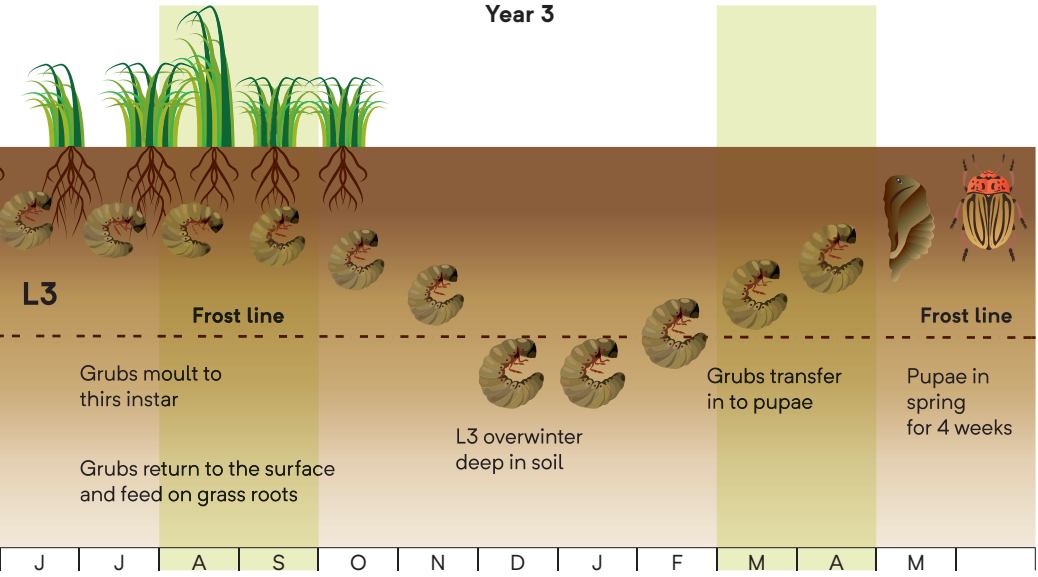
The first two have a one-year life cycle. Eggs are laid in June, larvae hatch and develop through summer, autumn and winter. In spring they pupate and the adults emerge in May to restart the cycle.

The Welsh chafer has a two-year life cycle — see below.

The cock chafer (May bug) is the largest UK resident chafer. It has a three or four-year life cycle. The larvae can grow to 25mm in the final year of the life cycle.

The populations of crane fly and chafer vary from year-to-year. Long term monitoring for crane fly in grassland areas indicates that population tend to rise and decline on a seven to nine-year cycle.

The most critical factor determining the population levels of larvae appears to be the weather conditions in May to August. The most vulnerable stage of the life cycle of both insects is from egg laying to 1st instar. If conditions remain moist during July (chafer) or September (crane fly) then very large populations of larvae can develop.



Leatherjacket, image courtesy of Syngenta UK.

This creates two problems:

- Direct feeding damage – The developing larvae feed either in the soil or on the surface of turf. In large numbers they can cause damage to the quality of the turf by grazing on the grass roots. This damage can be seen from late summer through to the spring. Patches of turf grow poorly and can become thin, sickly and look yellow. In extreme cases, the larvae consume the grass roots and the turf can be peeled away from the soil.
- Indirect Damage — the greatest and most visible damage is caused by predators searching for larvae.
    - Badgers and foxes will dig up the turf to find the developing larvae. This usually happens in late winter or early spring.
    - Crows, rooks, magpies, gulls and pheasants will also peck and scratch turf to find and eat the larvae — this activity can be devastating with large areas of turf being damaged or even destroyed.

In the past, greenkeepers were able to use soil acting insecticides to manage the populations of larvae for both crane fly and chafer. With the increasing requirements to protect the environment, operators and bystanders, these products are no longer available for use in the EU. This means that there are no options for greenkeepers to use when fairways or tees are under attack from these larvae. This means players need to understand why certain areas of the course may become damaged.

Greenkeepers are looking at alternative means of managing population to avoid the build up of larvae. For example, larvae numbers can be reduced by creating a hostile environment by rolling, coring and tining. This can, however, impact on play.

At the very early stages of development, both chafer (July/August) and leatherjacket (September) are susceptible to biological control using nematodes. The nematodes seek out the larvae to provide a food source for the nematode juveniles. Once the nematode is inside the larvae, they are infected with a bacteria which eventually kills the larvae. Prior to the larvae being destroyed, the nematode will have laid eggs and thousands of juveniles will have been produced which will move in the soil to find more larvae. The problem with biological control is that you need a very specific range of conditions for the nematodes to move and survive in the soil.

During the summer, soils on golf courses are often too dry for the nematode to survive. In September, which is the time of year to control leather jacket larvae, soils start to cool down and can often be too cold for nematodes to survive.

Your Greenkeepers will be doing everything possible to keep your course in prime condition. They cannot however, act outside the law and have to keep within very strict guidelines when it comes to using insecticides.

Chafer grub, image courtesy of Syngenta UK.

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