

Cause and effect

Jenny Murphy examines the types of pests in turf, and the treatments available

The management of fine turf will occasionally require the control of turf pest problems. This article aims to provide a working knowledge of the four major pests of turf, and how best to control them.

The problem of wormcasts is well known and an easy one to identify. However, the presence of insect pests such as leatherjackets, frit fly and chafer grubs are not so readily recognised and requires closer examination of the turf.

Worm casts

Earthworm casts are a mixture of earth and decomposing organic matter. In the UK, there are 25 species of earthworm commonly occurring. However, the majority of worm casting problems are the responsibility of just three species.

Earthworms feed on decaying organic matter found either on the surface or in the humus fraction of the soil. Some worms feed exclusively on humus found lower down in the soil profile. These species deposit their casts in their burrows. Other species may be described as 'surface feeders' and it is this group that contains the three species responsible for worm casts which have been deposited on the surface.

Benefits of worms

It is widely recognised that earthworms are beneficial to soil, especially in agricultural and amateur gardening situations. They aerate the soil and assist in drainage by producing deep burrows, which are kept open when worms are active. In addition they are important in the re-cycling of organic matter.

Disadvantages of worms

In the professional turf market, these benefits are out-weighed by the disadvantages and worms unfortunately reach pest status. Worms live in colonies so that their beneficial effects are not evenly spread. They cannot be relied on to produce the standards of drainage and aeration acceptable to the management of fine turf areas such as bowling and golf greens. The disadvantages can be devastating on fine turf:

- Worm casts are unsightly:

the aesthetic appearance of a green is highly important to greenkeeper and golfer alike

- Worm casts disrupt the playing surface of a golf or bowls green: a smooth surface with an appropriate speed is essential for both games
- An unresolved cast problem could create a slip hazard for players
- Casts form ideal sites for weed establishment and encourage the spread of turf disease
- The presence of high worm populations in fine turf is likely to attract moles - with devastating effect.

Factors influencing worm populations

Worms are encouraged by the conditions necessary to grow fine turf grasses:

- The right pH (6.5 - 7.5)
- A good soil texture (light, sandy soil/medium loam)
- A regular supply of food (grass clippings)
- Optimum temperature (similar to that for healthy grass growth)

Treatment

Apply a pesticide to moist turf at the first sign of casting activity. Do not apply when earthworms are inactive, such as during periods of drought or when the ground is frozen.

Leatherjackets

Leatherjackets are the larval stage of the crane fly (*Tipula* spp.) and can cause widespread damage to turf.

Identification

The grubs are legless, brown/grey or earth coloured and 4 cm long when fully grown.

The head is black and retractile, with a pair of horny jaws. On the last body segment, there are two dark coloured holes through which air enters the body; these are surrounded by six conical projections.

Life Cycle

Adult flies usually emerge in early September and lay their eggs in the sward. The eggs hatch after a few weeks, and the larvae which emerge

start to feed immediately. They may become dormant during cold winter months and may even be killed by severe frosts. If a high population survives the winter, extensive damage is caused in the spring, by which time the larvae have grown up to 4cm long, with a voracious appetite for grass roots and stems.

Damage by leatherjackets is often very severe if the autumn of the previous year was wet (i.e. favourable for growth and feeding of newly hatched larvae).

Symptoms

Both old grassland and newly established swards are attacked. The damage to turf is seen as patches of dead or dying grass. Examination of the turf by lifting sections of the affected grass will often reveal the grubs.

Large numbers of leatherjackets may also be indicated by the persistent attention of birds feeding on the grubs. The main culprits are rooks, starlings and gulls. These birds often do more damage than the grubs themselves, tearing up sections of turf in search of a meal.

Treatment

Application of pesticides can be made at any time from the beginning of November where high larval populations are detected or damage is first seen.

You should not apply during periods of frost, as leatherjacket activity is reduced under these conditions and treatment may not be as effective.

Chafer Grubs

Chafer grubs are the larvae of the chafer beetle family. The most frequently found chafer grub in turf is the garden chafer. Occurrence of these pests appears to be increasing in the UK.

Identification

Chafer grubs are pale, fleshy grubs with brown heads and curved bodies. They have three pairs of legs carried on the front segments of the body. They grow to about 1.2 cm long, although other less common species of chafer grub may grow up to 4 cm in length.

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Life Cycle

The life cycle of the chafer grub is variable (one - three years), depending on the species. For example, the garden chafer (*Phyllopertha horticola*) completes its life cycle in one year. The adult beetles emerge in late May and early June. Soon afterwards, the female burrows into the ground to lay her eggs, which take about five weeks to hatch. The emerging grubs feed on the grass roots until late autumn, when they burrow deeper to hibernate for the winter. The grubs pupate in the following spring and after about four weeks the adults dig their way out of the soil.

Symptoms

The damage caused to turf by chafer grubs is very much the same as with leatherjackets - i.e. dead / dying grass and flocks of birds - and can be severe. Positive identification of a chafer grub problem relies on finding the grubs under the affected patches.

Treatment

There is currently no pesticide available for the specific treatment of chafer grubs. Aventis is currently meeting this challenge with a new research programme to find a suitable product to control this pest. In the meantime, chlorpyrifos-based products are used. In the case of severe infestations, two applications are required two to three weeks apart, to suppress the problem.

Frit Fly

The frit fly causes problems in the establishment of newly-sown turf.

Identification

The larvae are almost colourless and very small, being just visible to the naked eye.

Life Cycle

Up to three generations of frit fly can occur in one year. However, damage to turf is restricted to those generations which are active at the normal sowing time for grass (spring and autumn). The adult fly lays its eggs on the shoots of young grasses and the emerging maggots burrow into the young shoots, causing withering of the affected plants. When fully grown,

the maggots pupate and give rise to adult flies.

Although a fairly rare problem in the UK, the occasional attacks can be phenomenal, particularly in autumn. Populations in excess of three million per hectare have been recorded.

Symptoms

The larvae destroy the central shoots of ryegrass, fescues and bents. They may affect both establishment and development.

Serious thinning of newly-sown grass swards can be seen following an attack. Close examination of the affected plants will often reveal the maggot or the small brown puparia (cases left behind).

Treatment

Application of a pesticide should be made at emergence, where damage is anticipated, or at first signs of attack.

Conclusion

Information from the Aventis Environmental Science Technical Helpline indicates that turf pest problems generally, and chafer grub populations in particular, are on the increase.

This could be due to climate change. Milder winters and fewer frosts allow higher populations of leatherjackets to survive the winter, and reduce the period of dormancy, encouraging pests to feed earlier in the year. In addition, warmer summers appear to be causing a trend towards greater occurrence of ants and more unusual species such as mining bees and cutworms (moth larvae).

Until recently, we often commented that the climate of the British Isles restricts turf pests to a manageable few. As indicated above, perhaps we should not be so self-assured....

To combat changing/increasing pest populations, current research and development (at EAS) is looking at new active ingredients and methods of application, with a wider target pest spectrum in mind.

The author, Jenny Murphy is Technical and Registration Manager of Aventis Environmental Science



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