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-weighted 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:
  - 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 cranefly (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 4 cm 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 drying 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 blocks 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 avail-
able for the specific treatment of chafer
grubs. Aventis is currently meeting this
challenge with a new research pro-
gramme 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, dam-
age 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 pheno-
nomenal, 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 bent. They
may affect both establishment and
development. Serious thinning of newly-sown
grass swaths 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).

Conclusion
Information from the Aventis
Environmental Science Technical
Helpline indicates that turf pest prob-
lerns 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 peri-
od of dormancy, encouraging pests to
feed earlier in the year. In addition,
warmer summers appear to be caus-
ing 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.

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October 2000 Greenkeeper International 23