

# Turf pest creatures

A series of articles aimed at a varying readership.

## Entry Level

This month, if you are new to greenkeeping, read on...

# great and small

Dr Terry Mabbett takes a look at all things not so bright and beautiful

**What's most surprising about animal pests of professional turf is why any predator of green plants would bother with close-cut grass with so little above ground to feed off.**

Indeed this is why the two major insect pests of turf in the UK are essentially subterranean problems. Chafer grubs and leatherjackets the larval stages of chafer beetles and crane flies, respectively, feed on and damage turf grass roots.

The first thing to say about the pests of professional sports turf, in the UK, is that golf courses here get off relatively lightly in comparison to those elsewhere and especially courses in North America. But that's not much comfort to UK greenkeepers waking up to find their greens and tees torn to shreds as an indirect consequence of chafer grub or leatherjacket infestation.

### Chafer grubs and leatherjackets

Direct damage to sports turf by these two insect pests is significant and serious in its own right but the real problems arise as collateral damage from the activities of much

bigger beasts of the feathered and furry kind. Birds, especially corvids (mainly rooks, crows and jackdaws but also magpies and jays) will peck at and tear up turf in a frenzied attempt to get at these tasty and nutritious grubs and particularly the creamy white, plump and juicy chafer grubs.

Much bigger beasts, in the form of badgers and foxes, are also major culprits in this connection and the bigger the beast the greater the damage to turf.

Indeed the foraging activities of badgers or foxes in securing an evening meal of chafer grubs or leatherjackets can easily put greens and tees completely out of play for long periods of time and require considerable work and many thousands of pounds to repair and re-lay torn up turf.

Unlike in North America there are not many dedicated insect pests of turf in the UK – chafer grubs and leatherjackets are the main ones, although frit fly can go up a gear to become an economic pest.

Until recently these were the only invertebrates (animals without backbones) recognised and registered as pests of turf in the



**ABOVE RIGHT:** Leatherjacket the larva stage of the crane fly (daddy long legs) and the second most important insect pest (after the chafer grub) on turf in the UK.  
**INSET ABOVE:** Plump and juicy chafer grubs are prime targets for animal predators which tear up turf to get at them.  
*Photograph courtesy Syngenta*

UK. However, recent years have seen some frenzied interest in even smaller animal pests with root feeding nematodes (microscopic roundworms) very much under the microscope.

### Microscopic roundworms (nematodes)

Root feeding nematodes are an enormous problem, throughout the economic plant world, with particular species causing huge losses in agricultural crops from potatoes





to tobacco. Their smallness of size has always hampered identification and recognition as pests and is clearly one reason why they have only recently come to the fore in professional turf.

Nematodes as turf pests are a bit of a conundrum for two reasons. Firstly, the leaf symptoms of nematode presence on the roots of turf grasses is rather diffuse and, in many cases, not a lot different from the symptoms caused by microbial pathogens and in some instances plant nutrient deficiencies.

For this reason, and because early scientists could not see the actual animal pest eating away at the plant (nematodes are too small to see with the naked eye and are underground on the roots), they would assume a microbial pathogen was responsible. For this reason nematode invasions of plant roots were traditionally called infections but, as animal pests of turf grass, nematodes are an infestation of the fibrous root system.

Secondly, not all species of roundworms are 'nasty nematodes'. Many are exceptionally useful like the species currently used in commercial biological control products to control chafer grubs and leatherjackets.

### Surface feeding earthworms

The other invertebrate pest not yet mentioned, and like the nematode a worm though much bigger and technically called an annelid (ringed worm), is the earthworm.

The other characteristic that earthworms have in common with nematodes is that not all are damaging as far as the golf course is concerned. Indeed, the vast majority are not only useful but downright essential for improving and maintaining the physical structure and fertility of the soil.

As far as the greenkeeper is concerned it is only the surface feeding species of earthworms which are a problem and specifically when they inhabit the soil underneath the pristine playing surface of golf greens and to a lesser extent tees. Unlike most earthworm species, which deposit their casts in the burrow, these surface feeding species deposit their casts on top of the turf when they come up to feed on dead and decaying plant matter in thatch, or debris such as grass clippings and fallen leaves on top of the turf.

Worm casts on sports turf are not only unsightly but clearly interfere with the run of play across the surface of the golf green. There is also a safety angle because contents of the cast have passed through the worm's gut picking up copious quantities of slimy secretions along the way. This not only makes worm casts difficult to remove without smearing the close-mown turf but may also create hazards for players who may slip on the slimy surface. What's more worm casts act as ideal germination sites for weed seeds coming onto the green. Moreover, the weed seed may already be there having passed intact through the



**ABOVE LEFT:** Red flag for danger' – a West Sussex golf green 'pecked to pieces' by corvids (rooks and crows) foraging for chafer grubs (Photograph courtesy Chris Humphrey)

**INSET ABOVE:** Worm casts make ideal germination sites for weed seeds and seedlings like the dock seedling shown here

**ABOVE RIGHT:** Worm casts on turf are unsightly and interfere with the 'run of play'; Surface worm casts are slimy, from having passed through the worm's gut, and therefore smear freely and easily across the turf to become even more unsightly and cause slippage

worm's gut and ready to germinate in the nutrient rich worm cast.

### Bigger beasts

And where there are worms there are moles. Anyone who has seen the movie *Jaws* will surely remember the classic comment made by actor Richard Dreyfuss who played the "shark expert" in describing how the shark is simply an "eating machine". "All they do is feed and make baby sharks," said Dreyfuss.

In many ways the mole is the terrestrial equivalent of this marine predator because all it does is burrow to find tasty soil animals to eat, almost entirely worms but sometimes slugs and other animals, and of course takes time off to make more moles.

Like the badger or the fox on the hunt for grubs this mammal, though much smaller and virtually blind, can do just as much damage to professional turf through its burrowing and inevitable and accompanying mole hills.

The more fertile the soil the more worms it will support and the bigger its attraction to the mole.

Turf damage by birds is usually collateral to chafer grub and leatherjacket infestations but there are particular birds, in certain situations, which can become pests of turf in their own right. These are wild water fowl such as the Canada goose and the pink footed goose which may see the first signs of new grass growth in March and April as an inviting early spring 'bite' and





ABOVE: Collateral damage from wild mammals (badgers and foxes) looking for chafer grubs can put greens and tees out of play for lengthy period of time as happened on this East Anglian golf course (Photograph courtesy Bayer Environmental Science)

subsequently crop the turf even lower than the mower manages to do. At the same time they will inevitably deposit their characteristically loose and slimy faeces across the turf.

Last, but not least, rabbits are also capable of cropping close-mown turf grass to cause significant damage in large numbers and leave something nasty behind, although in this case small, round and hard droppings which can easily be swept from the surface of the green or tee.

That said, most serious damage from rabbits on the golf course is most likely to arise from their burrowing activities and bark gnawing on young newly planted trees. Rabbits are particularly fond of sandy soils in which to excavate their burrows.

### Chemical control

Control of leatherjackets and frit fly was never a big problem once chlorpyrifos hit the market many years ago. Chlorpyrifos is one of the most useful and valuable insecticides on the market. And not only the turf market having been one of the mainstays of pest control

in agriculture, horticulture and forestry, and even public health, for many a year.

Despite its excellent control of leatherjackets it was never recommended for the control of chafer grubs, although not a few people automatically thought it controlled this pest too.

It probably would if it could get down to the chafer grubs but chlorpyrifos does not leach, remaining in the topmost layer and unable to reach chafer grubs lower down.

Several insecticides were traditionally used to control chafer grubs, but they were withdrawn when true extent of their 'poisonous nature' became apparent.

Several years followed with a gaping hole in the turf insecticide market and even bigger holes on greens and tees because greenkeepers had nothing to control chafer grubs.

Respite came with imidacloprid and revolutionising chafer grub control in a short space of time. Imidacloprid is doing the job and excellently too but there is probably room for at least one more insecticide to clobber chafer grubs and deprive the birds and the badgers of their 'free lunch'.

### Biological control

Chemical insecticides are not the only option because there are now biocontrol products based on entomopathogenic nematodes which invade the chafer grub or leatherjacket and introduce a pathogenic bacterium that kills these insect larvae.

However, those wanting a quick and complete kill and at any time of the year may be disappointed by biological control.

Biocontrol agents are, by definition, density dependant pest management factors, rising in number and activity alongside an increasing pest population. As such they work much more slowly than do chemical insecticides and will only reduce pest numbers to below economic levels rather than wiping them out.

In addition, these are living organisms with much more stringent environmental requirements (eg temperature, soil moisture and relative humidity and soil pH) for their activity compared to chemical insecticides.

Timing of control is clearly important with greenkeepers needing to catch chafer grub and leatherjacket infestations as early as possible,



and in this context they can put the activities of predatory animals to good use. Not badgers and foxes because these are nocturnal animals which will tear up your turf to get at the larvae without warning, and under the cover of darkness, but the birds are a different matter.

If you notice that birds, especially corvids but also starlings, are taking an unhealthy interest in your turf, like something out of the iconic Hitchcock movie, *The Birds*, then there is almost certainly something 'for the birds' under your turf and it is time for you to move in, lift a sample of turf to identify the pest and to apply the appropriate insecticide.

**Managing surface worm casts**

While carbendazim remains on the market greenkeepers will have little to worry about in managing surface casting earthworms. However, there are other things which can be done to help the situation and minimise their activity. First and foremost don't encourage surface feeding by leaving debris including grass clippings and fallen leaves on the green.

Always box off clippings and keep the greens and tees well swept especially in autumn when the leaves of deciduous trees fall fast and furiously. Creating an acid reaction in the surface layers of soil using approved soil conditioning products, including those based on sulphur and ferrous (iron) sulphate, will deter surface feeding earthworms. Turf grasses perform best in slightly acid soil conditions but will react negatively if the pH gets too low. It is all a question of balance.

**Mole control in hole**

Dealing with moles is a 'prickly' problem, not least due to inherent difficulty, but also because the remaining methods, though legal, are not too pleasant for moles which are protected species in other European countries.

Traditional use of worms laced with strychnine and used as mole bait was banned five years ago. Remaining methods are strictly for professional mole catchers and pest control operators.

Surprisingly gassing is still allowed but this is strictly for the trained and certificated pest control operator. What's more, the chemicals used are essentially nerve poisons in mode of action and hardly the sort of thing you want wafting around the golf course.



**INSET ABOVE:** Tell-tale signs of wild rabbits on a North London golf course

**BOTTOM RIGHT:** Wild water fowl such as Canada geese (Photograph 9) and pink footed geese (Photograph 10) are surprisingly fond of short damp and wet grass for feed, rest and play

**RIGHT:** Leaves on the green encourage surface feeding earthworms and their casts



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Old timers used all manner of traditional deterrents including moth balls (naphthalene) placed in the mole hole but that is illegal now because naphthalene containing mothballs are banned within the EU. Others would place sprigs of holly down the mole hole attesting to the fact that mole control is a 'prickly problem'.

Perhaps the most innovative old time method was sinking bottles into the turf with their necks protruding marginally above the soil surface. Musical notes thus generated by wind blowing across the open tops of the bottles was claimed to deter the moles but this is clearly a definite 'no-no' from the 'health and safety' point of view.

The Americans claim that playing music down the holes will clear an area of moles.

The only problem is if the moles decide they like the music and stay around to listen.

**For bunnies and birds**

Similar caution goes out for rabbit control with the clutch of claimed options such as gassing, 'blowing up burrows' and shooting strictly for the trained expert, although as for moles these are not the sort of activities suitable for intensively

used golf courses many of which are also public rights of way. All newly planted trees should be fitted with rabbit proof tree guards or tree shelters.

As for wild fowl tucking in to an early spring 'bite' on your greens, most if not all of these are protected species. All you can do is wave your arms and make loud noises and hope they will not come back. Seriously though if this becomes a persistent problem there are a number of innovative bird scaring devices mainly targeted at the agricultural market but equally ideal for the amenity sector.

