EARTHWORMS

BIGGA

What can greenkeepers do to prevent earthworm casts?

Earthworms are unsung heroes, helping keep the grass beneath our feet healthy and in a great condition for golf. Yet they're often derided for the casts they produce that cake your ball and shoes in mud if you land among them.

But did you know that only four of the 28 species of worms in the UK produce casts, yet all are an important element of healthy soil ecology?

Environmental conditions experienced during recent years have been conducive to the production of casts, leading to serious problems in many areas. There are only a few situations where worm casts cause a problem, but sports turf is one of them.

The revocation of carbendazim, a pesticide that suppressed casting earthworms, has left greenkeepers and groundsmen with no registered chemical control products in this area. Earthworms are classified as a key beneficial species and, as such, it is highly unlikely any further products will be developed for worm control.

Instead, greenkeepers and golfers must come to terms with an increased number of casts on their course, while the course maintenance team and wider industry investigate new ways of managing earthworm numbers across in-play areas.

The four species of casting worms all feed on organic surface matter, but that

The positives

The advantages of having healthy worm populations in the soil include:

- Improved soil fertility
- The breaking down of organic matter to humus
- Improved crumb structure and soil stability
- Aiding aeration of soil profile
- Reduced compaction
- Collection and decomposition of decaying organic matter that would otherwise build up as thatch
- Improved surface drainage
- Reduced build-up of phytotoxic gases in the soil
- Increased activity of soil-borne bacteria

The negatives

Potential issues caused by casting worms include:

- Unsightly and numerous casts
- Collection on soles of shoes
- Uneven playing surfaces and adversely affected ball roll
- Build up can in the short term ruin playing surfaces
- Casts encourage weed seeds and germination
- Casts can be sticky and slimy
- Problems with machinery
- Damage to bottom blades of mowers
- Casts alter the height of cut, due to build-up on mower front rollers
- Smearing after mowing
- Casts smother finer leafed grasses

does mean there are things greenkeepers can do to reduce their impact.

In the absence of a product to control casting earthworms, greenkeepers and groundsmen have a range of options that can contribute towards reducing instances of worm casts.

Potential control options:

Cultural practices

The removal of surface litter and collecting clippings will discourage surface feeding worms. Trials where cuttings on approaches were 'boxed off' and taken away have shown significant reductions in casting and have reduced the population of the casting species the second year after beginning the practice. This is labour intensive but achievable.

Brushing

Brushing or switching prior to mowing helps to alleviate smearing and mowing problems. This can be achieved using manual labour or with brushes mounted in front of the cutting units.

Drainage

By improving drainage and introducing freely-draining abrasive materials, such as coarse sand, greenkeepers can create an environment that is less conducive to worms. Using a range of cultural techniques to improve drainage will help reduce overall worm populations and as a result lower the impact of worm casting.

Keeping the worms lower in the soil profile will significantly reduce surface casting without losing the benefits of worm activity in the soil profile. This is not easy to reproduce in real conditions but not over-irrigating will help.

Use of a programme of penetrant-type wetting agents long term can reduce the average soil moisture levels through the profile.

Encouraging bird populations

This is the most positive method of controlling earthworms as it provides food and habitat for other animals and helps to improve the overall ecology of the golf course. It is also entirely sustainable and removes a significant maintenance burden from the greenkeepers by taking advantage of a natural process.

Antagonism

Worms are very sensitive to skin antagonism — worms breathe via their skin and mucus membrane. If the membrane is damaged, worms 'drown' through lack of oxygen. Products known to affect the mucus membrane include detergents, formaldehyde, certain wetting agents and saponins.

However these products cannot be used to control worms unless they are registered as pesticides. Applying non-registered products for the control of pests is illegal.

Currently the Chemicals Regulation Division (CRD) of the Health & Safety Executive is assessing a number of applications in this area.

Additionally, these products are all non-selective and will impact all species of worms and possibly other fauna. The environmental impact of these products needs to be tested for:

- The impact of removal of all worm species on the health of soil.
- The environmental impact on the species that consume worms.
- The ecotoxicity of these products in water

The future

Worms in most soils are regarded as key beneficial species. As we learn more about interconnected ecosystems, there is a greater awareness of the important role earthworms and other organisms within the soil play in the production of a healthy playing surface and environment.

The ultimate solution may be an acceptance among golfers that earthworms are an unavoidable occurance in some areas and a positive representation of the health of the overall golf course environment.

However, we understand that they do create a number of problems that can impact the activities of greenkeepers. Scientists are looking at a wide range of options for the specific problems we have in turf:

- Identification of pathogens which impact casting worms but not the other beneficial species
- Reduction of casting activity

Greenkeepers and groundsmen will have to use a combination of the cultural and nutritional approaches mentioned within this leaflet to manage earthworm populations and reduce surface casts as much as is possible.

To achieve this objective, we need to know more about the worm species that do cause us problems and create an environment that discourages their activity in the key areas of golf courses, such as tees and greens.

Work is underway to find a solution to this problem. But until that arises, we ask for the patience of golfers when it comes to worm casts found around the course.

For more information contact the British & International Golf Greenkeepers Association
Coxwold House, Birch Way, Easingwold Business Park, Easingwold, York YO61 3FB
T: 01347 833800 | E: info@bigga.co.uk | visit www.bigga.org.uk