We spoke to three of the major chemical companies to find out how they are marshalling their resources to fight a battle with ever decreasing weaponry

Cast of thousands

David Agar, of Rhone Poulenc Amenity; Bernard Hedley of Rigby Taylor and Alan Shaw, of Scotts UK Professional, all gave their views on the worm problem...

Rhône-Poulenc Amenity – David Agar

The arguments for controlling casting worms in certain situations are well known and accepted. Not only do worm casts create a nuisance for both the golfer and greenkeeper by producing an uneven playing surface and affecting the roll of the balls but they also spoil grass surfaces in a number of ways. They are unsightly, prone to smearing and bring weed seeds to the surface where they provide ideal sites for weed establishment. Worm casts also encourage the spread of turf disease, and the presence of high worm populations in fine turf is likely to attract moles - with devastating effect.

There are 25 species of earthworms commonly found in the UK, three of which are responsible for the majority of worm casting problems. One of the fundamental problems is that earthworms are encouraged by the conditions necessary to grow fine turf grasses and cultural control is therefore very difficult without affecting the health of the grass. Consequently, when worm casting reaches an unacceptable level, chemical control is the only reliable option for the greenkeeper.

The number of products available for the control of casting worms has recently been reduced with the withdrawal of Camma-col from the market and there is no guarantee that the remaining products will not be placed under further pressure in the future. However, one thing that can be guaranteed is the fact that worm casts will continue to be a major problem for the greenkeeper regardless of the number of products available to control them.

So what is Rhone Poulenc Amenity doing to solve the problem both now and in the future? Well, not only do we have a number of existing products that we are actively supporting and defending but we are also investing in the development of new products. We have a number of exciting developments in the pipeline and have just been granted a new worm cast suppression recommendation for Mildothane Turf Liquid.

The existing product range includes Castaway Plus and Cavalier which are both well known and widely used products. Castaway Plus is a leading brand containing the active ingredients thiophanate-methyl and lindane. Cavalier is based on carbaryl and is available only to contractors who can prove that they have equipment that meets the conditions stated on the product label - that is a closed cab and low level induction bowl.

Mildothane Turf Liquid which is well known to many greenkeepers as a reliable and effective product for controlling turf diseases, can now be used to suppress worm casts. In addition to the 20L/ha recommendation for the control of Fusarium, Dollar Spot and Red Thread it now has an economical 7.5L/ha recommendation for the control of casting worms. Based on thiophanate-methyl, Mildothane Turf Liquid offers selective suppression of the main species of casting worms leaving many of the other species unharmed. This is because the product does not work by direct contact with the worms but is taken up by the grass and the treated material is then ingested by the worms.

In summary, it appears that there may be fewer options available to the greenkeepers for the control of casting worms in the near future but we at Rhone Poulenc Amenity are confident that the investment and development we are currently undertaking will ensure that we will always be able to provide an effective and economical solution to what will continue to be a major problem for the greenkeeper.

Cast of thousands

Alan Shaw, of Levington Horticulture

Over the years, the industry has seen an ever shrinking range of options for the control of casting worms on golf greens. That they need to be controlled on the greens is undeniable - the trick is formulating a product to do it that doesn't also carry all sorts of unpleasant side effects.

One generation of greenkeepers will recall Chlordane - which was a highly effective worm killer - and its recall on safety grounds. A previous generation may have sworn by Mowrah Meal - equally effective and equally undesirable. Most greenkeepers today will also be aware of carbaryl - another worm killer which has been withdrawn because of health and safety issues.

That the approval for use of horticultural pesticides is regularly reviewed, has to be supported and

Rigby Taylor – Bernard Hedley

There is a distinct possibility that in the future there will be few effective worm killers available for use by the Greenkeeper. This is already the case in some European countries such as Germany where there are no such products available and where Greenkeepers have had to learn to live with higher worm populations.

At present in the UK one of the most effective chemicals approved for this use is carbendazim, the active ingredient within Mascot Systemic, however, even this material is now under threat.

Any future development of products specifically for worm control in turf by agrochemical manufacturers is also unlikely as the initial screening procedure for potential products carried out by agrochemical companies rejects active ingredients that exhibit any harmful effects to earthworms. This is because in Agriculture, earthworms are quite rightly regarded as beneficial organisms and any such effect on worms would be a great disadvantage.

If new products are not going to be developed, what about using some of the old products that were used in the past, eg. Mowrah Meal, Derris Dust and Potassium Permanganate? These materials were used as expellants, they irritated the earthworms skin and brought the worms to the surface where they were collected. Unfortunately all of these materials had their drawbacks and their use was very time consuming. Another treatment which has shown promise and which is currently being investigated is the use of Mustard as a worm expellant, however it can scorch and large amounts of water are required.

It is likely that the use of sulphur containing materials to acidify soil conditions will become one of the most important methods of minimising earthworm populations. It

may also be that machinery manufacturers will have to try to develop mechanical methods of earthworm control or equipment will be developed which can very effectively remove casts from the playing surface. Physical barriers to earthworm movement will also perhaps be included in the construction phase of greens.

Rigby Taylor Limited have always advocated the use of IMP (Integrated Pest Management) for the control of earthworms in turf, ie the use of all possible methods available to minimise cast formation without relying on chemical methods alone. Such methods include:

- The avoidance of pure organic fertilisers or top-dressings on sites where there are high worm populations.
- Acidification of the soil by application of sulphur or ammonium sulphate.
- The avoidance of alkaline materials, e.g. top-dressing; and alkaline irrigation water.
- Boxing-off of clippings around approaches and surrounds of greens.
- Reduction of "thatch" build-up.
- Improvement of drainage.
- Brushing of casts off the surface if conditions allow.

Unfortunately, although these measures will help reduce worm activity, they will not produce the level of control that pesticide treatments can achieve and greenkeepers may have to learn to live with much higher populations of earthworms, unless new effective control measures are developed quickly.

applauded. If the Ministry did not do this we could still be flinging mercury and potassium cyanide around to control pests and diseases. However, the process has tended to result in more product withdrawals than there are launches. And in the case of worm cast control on the domestic market, has left the amateur gardener with no chemical control at all, following the withdrawal of carbaryl.

For the greenkeeper, however, Levington Turfclear (containing carbendazim), is specifically recommended for the control of the worm species which cause damaging and undesirable worm casts on the surface of the sward.

The non-casting worm species which are beneficial for drainage and soil aeration are largely unaffected.

As an added benefit, Turfclear is a proven fungicide which acts systemically against common turf diseases such as Dollar Spot and Fusarium Patch.

Its efficiency is unaffected by rain or irrigation, and no turf phytotoxicity problems have been noted when the product is used as recommended.

For the best results it should be applied as a preventative treatment in the Spring and Autumn to control casting worm species and diseases, or at the first sign of attack.

Scotts®