



# techtalk

## Effective slug control

Slugs left unchecked can have a devastating impact on crops, affecting both yield and quality. With current pesticide control options under ever increasing environmental scrutiny, growers must continue to demonstrate best practice as well as follow current IPM protocols.



# Avoiding a slugfest

The danger from slugs is ever present so it pays to think about lowering risk before the next crop goes into the ground. *CPM* picks up the slime trail to find how to defend crops this autumn.

By Lucy de la Pasture

In spite of the threat posed by cabbage stem flea beetle to the oilseed rape crop, slugs remain the number one pest in the UK by virtue of the fact that they're not fussy feeders so for most crops they can pose a risk.



*Phil Carpenter explains that nauseous slugs retreat below the soil surface once they've consumed a lethal dose of ferric phosphate.*

Much will depend on the weather during autumn establishment, but integrated pest management considerations begin before an autumn crop is planted. By the time a problem develops in the field it's a case of playing catch up.

*CPM* catches up with De Sangosse's Phil Carpenter to take a look at the season ahead and key pointers for keeping slug numbers at levels that won't cause a problem.

## What's different this year?

With the nightmare of last autumn still fresh in the memory, many growers are feeling reluctant to delay drilling crops this autumn, with getting an autumn cereal crop in the ground this year likely to be a priority.

An early start to harvest and some ground left in fallow or planted with cover crops will mean ground will be available for first wheats. In these situations the risk of slugs is likely to be higher than in a second wheat situation. The forced change in rotation in the 2019-2020 season will have an impact on slug risk as drilling wheat after peas and beans can be as high risk as drilling after OSR.

This autumn there's likely to be a mix in slug populations — with slugs at different stages in their lifecycle. The dry weather through spring and summer doesn't mean the slug threat has gone away. A lot will depend on the weather between now and harvest and the green bridge that develops. But slug risk is also likely to be affected by the degree of soil

damage done by the heavy rainfall over winter and where crops were hurried in this spring.

## Has label advice changed?

Label advice for ferric phosphate hasn't changed, though more brands are available to growers this autumn. Metaldehyde will remain available for sale until the end of the year (2020), when it's premature revocation by the Secretary of State in Dec 2019 will be finally enacted, with a use-up period until 31 Dec 2021.

All the lessons learned during the decade-long campaign by the Metaldehyde Stewardship Group are key to the stewardship of ferric phosphate, which will become the only molluscicide registered for use in the UK. Adopting an IPM approach to slug control, with slug



“ Soil and stubble management are the start of cultural controls.”



*Slugs are likely to be at mixed growth stages as crops are planted this autumn, with plenty of eggs poised to hatch.*

skin, footsole and digestive tract of the slug, resulting in the excessive slime production and slime trails which is characteristic where slugs have ingested metaldehyde pellets.

Ferric phosphate has a completely different mode of action. When a slug eats a proportion of a ferric phosphate pellet, the overload of iron impacts calcium metabolism which affects the slug's digestive system and stops the slug from feeding. Affected slugs become sensitive to light and hide out of sight, so they aren't visible on the soil surface. It's a bit like having too much beer and wanting to hide away the next day.

A lethal dose of ferric phosphate occurs when as little as one third to one half of a pellet is eaten, so often pellets can still be seen lying on the soil surface, so this isn't an indication that slugs haven't been feeding on the bait.



*Every brand of slug pellet has different ballistic properties and application equipment should be recalibrated for each type.*

## What's best practice pre-drilling?

This autumn is the second without Deter (clothianidin) seed treatment, which had a deterrent effect on slugs and reduced establishment losses through seed hollowing. For those drilling in an earlier autumn window, crops can be at particular risk as slug eggs are more resilient and will hatch as seeds chit.

The De Sangosse products have a seven-day pre-drilling recommendation on the label which provides growers with an extra tool if the crop due to be planted is deemed to be at risk. This can be determined using in-crop trapping before harvest in slug prone areas of the field to help understand the slug population present and the likely pressure points, which can then help in developing the best IPM strategy for the following crop. The weather at drilling also needs to be taken into account — if dry then there will be a low risk of slug activity.

Cultivations can be used to reduce slug populations pre-drilling by exposing them to predation and from an IPM perspective this is a better course of action than applying a pellet. But in no-till situations this isn't an option and where risk justifies the application before drilling, pellets can help prevent seed hollowing wheat and OSR establishment.

Where pellets have been applied before drilling, cultivating after application isn't advisable as it will break up the pellets and the



*Refuge traps provide the best way of monitoring for slug activity and triggering a pellet application if thresholds are reached.*

soil movement will reduce the slug population anyway, therefore negating the need for the molluscicide.

## How should the seedbed be prepared?

Soil and stubble management are the start of cultural controls for the next crop. Where ploughing is practiced this has a useful effect disrupting the slugs' habitat by burying trash and inflicting mechanical damage. But secondary cultivations are as important, with care needed to avoid open seed channels and cloddy seedbeds which allow slugs to thrive.

Where min till is preferred, moving the surface trash around helps by disturbing the slugs' habitat and exposing slug eggs to UV light. The biggest weapon in

## Effective slug control: top tips

- **Consider slug risk and timing of pellet application** — match monitoring information with soil conditions, tillage and weather forecast to make decisions.
- **Match expectation of application to the pellet chosen** — formulation plays an important part in efficacy and durability, as well as the number of applications needed.
- **Don't overlook machinery calibration** — every brand of pellet has different ballistics, so machinery needs to be calibrated for each type.

pellets as the final option is just as important with ferric phosphate as it was with metaldehyde.

Monitoring slug populations using refuge traps, correctly calibrating machinery for the brand of pellet being applied and applying them at the right time are all measures that will help keep ferric phosphate available to growers.

## How does ferric phosphate work?

Both active ingredients prevent damage to crops by quickly stopping the slug from feeding on crops by interfering with the slug's metabolic processes, ultimately causing their death. But the way the slug behaves once it has taken a lethal dose is very different for both active ingredients.

Metaldehyde works by targeting the mucus-producing cells in the



*The biggest weapon in the cultural armoury is a set of rolls.*

▶ the cultural armoury is a set of Cambridge rolls, which help make sure the seed is well covered in all types of tillage regimes and consolidate the seedbed to help reduce ease of slug movement.

In a direct-drilling scenario, slugs are generally lower risk because they're less able to travel through the soil surface. Stubble management is crucial to minimise trash that provides refuge for slugs and any green bridge that may develop.

## What about follow-up treatment?

De Sangosse have silver reflective traps available for slug monitoring that offer advantages over standard types placed in the field, which are reliant on soil moisture alone to provide a slug haven. The traps are first soaked in water and when placed in the field the UV is

reflected away, maintaining an area of moisture under the trap which is attractive to slugs. The traps are baited in the same way as any other refuge trap, with chicken mash a firm favourite on the slug's menu.

Trapping is the key to monitoring the slug population and any follow-up treatment can be decided taking this information in conjunction with weather conditions — with mild, wet conditions favouring slug activity.

The conditions which favour slugs don't always favour the longevity of pellets. Pellet formulation has an impact on the efficacy of pellets under adverse conditions and number of applications that may be required so is a consideration in an IPM approach.

Wet-process, durum wheat pellets are the most resilient and

under rain and submergent studies, De Sangosse pellets have been shown to maintain their integrity under high pressure. If conditions are sub-optimal then it makes sense to match the pellet formulation to the conditions they will encounter in the field.

## What about beneficials?

Conserving the natural predator population can favour increased predation of slugs and their eggs by natural enemies, such as Carabid beetles, but these need to be allowed to build up before any slug explosion. Managing

cultivations, minimising insecticides and planning rotations provide the best foundation for controlling slugs and receiving a helping hand from beneficials. ■



*Stubble management can play an important role in managing slug populations before drilling.*

## Sponsor message

Cost-effective slug control isn't complicated, but it does rely on pellet quality. De Sangosse recognises that palatability, persistency, attractiveness and ballistics are essential criteria to ensure maximum performance and efficacy.

Delivering all four of these characteristics is determined by using only the finest quality durum wheat flour, rather than ground wheat, and this goes through an advanced wet manufacturing

process to form a high-quality pellet. The addition of water during pellet formation and the extrusion process minimises dust and makes it better able to resist varying climatic conditions.

Pellet size and density is critical to enabling accurate and uniform spreading at the distances required today. De Sangosse slug pellets are more consistent and durable and with a high level of persistency, pellet integrity is assured.

## Timing is of the essence

A wet and warm winter coupled with shallow and cloddy seedbeds plus the loss of Deter seed treatment, could seriously exacerbate a potential slug problem this autumn, says Harlow Agricultural Merchants (HAM) senior agronomist Andrew Rhodes.

"Autumn 2019 presented the perfect conditions for slugs to flourish so there are lessons to be learnt to keep ahead of a potential problem this autumn. As soon as there is any evidence of activity in crops, action must be taken to eliminate it," he says.

His Harlow district experienced 96mm of rain during Oct, a large percentage of the 500mm total annual rainfall. "The rainfall shifted to the last four months of the year, which coincided with the slug breeding time and the key drilling period."

He advises looking at slug control options as soon as autumn drilling

starts. The loss of Deter seed treatment compounded the slug problem this spring and most growers won't remember a year when there hasn't been a seed treatment that offers some slug control, he adds. This is going to be new territory and therefore a challenge for arable farmers this autumn.

Slug control trials carried out by HAM have deduced that Ferrimax Pro is the most effective form of slug control available on the market currently. "It's the durability, efficacy and excellent ballistics that makes this pellet stand out above the others. Farmers like to see slug baiting points because the historical understanding was that the more pellets on the ground in a given area meant a higher chance of killing slugs," says Andrew.

"Actually, that isn't the case. We've seen data from ferric phosphate

manufacturer De Sangosse that show that its durum-based pellets provide better durability and longevity, so require far fewer baiting points to achieve at least the same level of control as a wheat-based pellet.

"Larger pellets generally take longer to breakdown due to weathering and they can be spread more accurately over wider distances. Degradation of a smaller, low quality pellet will only increase the opportunity for slug damage.

"Ferrimax Pro stays on the surface for up to three weeks after application, even in high rainfall situations, while many other ferric phosphate pellets simply dissolve in the wet, rendering them ineffective."

Andrew recommends applying Ferrimax Pro at 7kg/ha straight after drilling to minimise risk of seed hollowing and then again four weeks



*The danger of grain hollowing has become greater since the loss of Deter seed treatment and slug populations need close monitoring to avoid early damage, says Andrew Rhodes.*

later to stop leaf shredding, where risk of damage is present.

"We'll start monitoring for slugs as soon as we see damage before applying the ferric phosphate pellet. Incidence of seed hollowing is likely to increase in severity (without Deter), so once an attack has been identified, time is of the essence."