



“Once sprouting starts in the field, it’s a hell of a job to stop it in store.”

Roots Potatoes

All in the timing

Controlling the risks of sprouting begins long before a potato goes into long-term storage. CPM attends a recent AHDB webinar to learn how to get the best out of maleic hydrazide applications.

By Lucy de la Pasture

The demise of CIPC has resulted in a more integrated approach to managing sprouting in potatoes — and that means considering the problem from every angle. That includes making use of varietalfactors that can help reduce reliance on chemical sprout suppression — such as inherent dormancy characteristics and cold-temperature tolerance — as well as store management practices.

Even though it has been approved since the mid-1980s, maleic hydrazide now has an enhanced reputation as the foundation for successful sprout suppression in store,

says AHDB’s Adrian Briddon.

“Maleic hydrazide was mainly used to control volunteer potatoes — tubers that were left in the field after harvest would be inhibited from sprouting in the spring. More recently it has been recognised for its wider benefits, which include inhibiting secondary growths and internal sprouting, as well as sprout suppression in storage.”

Sutton Bridge

The effects of MH are being investigated in ongoing work at Sutton Bridge which has clearly shown the relationship between the level of MH residue in tubers and efficacy. But Adrian points out that there seems to be differences between varieties, with some much more efficient as getting MH residue into tubers than others — Titan, for example, in one trial was 100% more efficient than Maris Piper in this respect.

“Notably we’ve seen a clear trend towards Innovator having a high concentration of MH in tubers and Royal a low concentration over four seasons of study,” he says.

“We’ve also found that where MH is applied to the growing crop, internal sprouting is extremely rare in AHDB trials. This is something that may become

increasingly important when using volatile sprout suppressants and the more frequent cycles of treatment to burn-off sprouts and store flushing these require. It’s these repeated cycles between sprout growth and sprout inhibition which increase the risk of internal sprouting occurring.”

Having success with MH is all about ▶



Adrian Briddon says that in trials, some varieties seem to be more efficient than others at translocating maleic hydrazide to tubers.

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Attention to detail at application is the key to success when it comes to getting the most out of maleic hydrazide, highlights Geoff Hailstone.

▶ getting it on at the right time, with the best possible chance of translocating sufficient residue into the tubers, says UPL's potato crop lead Geoff Hailstone. The recommended timing of Fazor (maleic hydrazide) application is three to five weeks ahead of desiccation.

"When sufficient MH residue is within tubers, it provides long-lasting sprout suppression at the cheapest cost per tonne of all the available products. Last year residue levels were good, and this showed in its performance in store. It may have partly been due to weather conditions when it was applied but the greater focus on MH could also have played a part," says Geoff.

Once applied to crops, MH is translocated to the tubers where it inhibits

New closed transfer system for sprout suppressant

A new time-saving closed transfer system will enable growers to maximise the area covered when conditions are just right for application of sprout suppressant maleic hydrazide.

Wisdom Systems has been working with Certis to help deliver its liquid maleic hydrazide product, Crown MH, from 600L IBCs to sprayers much quicker than is possible with 5kg packs of granular formulations, which are prone to foaming.

Richard Garnett of Wisdom Systems says many sprayer operators will already be familiar with the FasTran 850 CTS. "It's widely used to deliver and meter products, such as glyphosate and micronutrients, from IBCs into the sprayer's chemical induction system.

"With traditional packaging and open pouring, we estimate that the average large sprayer takes about 10 mins to fill with water and another half an hour to put all the product in the tank. Our system fills the sprayer with water and the



The new FasTran 850 closed transfer system for liquid MH will save half an hour per sprayer fill-up, reduce operator exposure and eliminate waste packaging.

required amount of Crown MH at the same time to save half an hour per fill-up which enables operators to apply an extra 1-2 loads per day."

The system also greatly reduces operator exposure risk and eliminates waste packaging as suppliers collect and recycle the IBCs free of charge, he adds.

cell division but not cell elongation, he explains. "Marketable tubers must have reached more than 25mm at the time of MH application, any smaller than this then there's a risk of yield loss. Usually, the flowers will have mostly fallen and there may be some drying out of the basal leaves, though the crop mustn't be starting to senesce because the MH won't be translocated as effectively."

Weather conditions can play a big part in the efficacy of MH, with application during any conditions which cause the plant to shut down — such as heat >26°C ▶



Timely application of maleic hydrazide can prevent secondary growth and chain tuberisation.

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Residues of blight sprays on potato leaves, particularly mancozeb, will reduce the uptake of maleic hydrazide by as much as 50%, according to UPL trials.

► and water stress — to be avoided. Water volumes should be 350-500 l/ha and a period of 24 hours without rain is essential to maximise uptake, he notes.

“It’s best to wait for cooler daytime temperatures and higher relative humidity rather than rush to get the MH on — when the RH is higher, the spray droplets take longer to dry on the leaf which leads to greater uptake. We also advise waiting for 2-3 days before applying MH after a stress period, such as rain relieving a drought, to prevent secondary growths,” adds Geoff.

UPL trials have also highlighted some things to avoid because of their adverse effect on Fazor uptake. “We prefer MH to be applied alone and not in tank-mix with a blight spray, particularly ones

containing mancozeb. Our trials have shown a 50% reduction in MH residues in the tubers when it’s applied together with mancozeb.”

The scheduling of blight sprays is also important, he says. “Even mancozeb applied three days before applying Fazor reduced the residue of MH present in tubers. We believe the mancozeb covering on the leaves reduces its uptake. It’s better to fit blight sprays around MH application rather than the other way around,” he says.

Another potential partner to avoid is Kantor, a drift retardant often added to the tank with blight sprays, highlights Geoff. In UPL trials the uptake of MH was severely limited when it was used.

Critical period for slug control

Potatoes are a tricky crop to keep free from slug damage, with control relying on management across the whole rotation as much as in the potato crop.

Even with cultural controls growers are tied into some practices without, in many cases, much opportunity to change, suggests Amie Hunter, an agronomist for Hutchinsons based in Cornwall.

“It’s difficult — technically you can switch varieties into less susceptible ones but, in reality, growers are tied into growing what the end market requires.”

Similarly with rotation it can be difficult to make changes to reduce risk, even more so on rented ground. “Brassica crops in the rotation can build slug numbers ahead of potato crops, but it’s usually a case of being aware of it rather than something potato growers can change,” she says.

Cultivations help disrupt slug life cycles, which is one positive attribute of the relatively heavy cultivations made ahead of potato planting. But once the crop is in the ground, the key to in-crop control is an initial slug pellet application just before canopy closure, with repeat applications usually after three weeks and again around desiccation when the canopy opens up again, she says.

August is a critical period for slug control during the early stages of tuber bulking, before slugs go underground to find developing tubers.



The initial applications help ensure pellets reach the soil surface before it becomes too difficult to penetrate the crop canopy — usually in late June to early July, when the canopy is sufficiently open to allow pellet penetration (0-75% canopy closure).

A second critical period for slug control occurs at the early stages of tuber bulking, before slugs go underground to find developing tubers. August is the pivotal month for follow-up applications and when damage usually begins to appear, she explains, with continued monitoring necessary until burn-down.

“We always use a trapping system in each field to monitor populations before deciding on treatment. The damage-risk threshold is one slug per trap — understanding and monitoring thresholds is a vital management tool for slug populations,” says Amie.

“The key characteristic potato growers are looking for in pellets is persistence — it’s no good having something that disintegrates quickly in the moist environment under the canopy or with a bit of rain — and spreadability.

“You usually need them to spread 24m. It’s important for any crop that you can do that accurately, but especially in a potato crop — you don’t want to leave a whole row of potatoes unprotected, which could have a huge impact on the financial viability of the crop.”

As well as its ability to spread, pellet integrity is critical in the potato crop. Amie has found the De Sangosse pellet X-Ecute has shown that when spread at 24m it can withstand being thrown over this distance.

“Manufacturers put a lot of work into how well they spread in terms of the hardness and size of the pellet, and also its uniformity. If pellets are variable in size or weight they spread differently and less effectively.”



The key to in-crop slug control is an initial pellet application just before canopy closure, with repeat applications usually after three weeks and when the canopy opens up again, says Amie Hunter.

Those factors favour the use of a high-quality ferric phosphate-based pellet, she says.

“It spreads well and is very durable in terms of weatherability. It’s a slightly bigger pellet than others which I think helps with durability.”

The 2.7mm wet process durum wheat-based pellet also contains unique attractants based on oilseed rape, which De Sangosse claim helps attract slugs to the pellet. That could be helpful in a potato crop, where targeting the slugs is challenging and relies on them coming to the surface to feed on pellets.

“In the field it’s difficult to say whether that actually helps — but they are definitely palatable to slugs,” says Amie.

With metaldehyde in its final year of use up, many potato growers have already switched into ferric phosphate alternatives, she notes. “There hasn’t been any loss of efficacy, but you won’t see the slime trails and dead slugs on the surface that growers used to see with metaldehyde as it has a different mode of action. It’s a difference you have to get used to.”

Potatoes are the biggest enterprise on the farm for North Yorkshire grower Andrew Wilson. He grows for the processing market — chips and crisps — and everything goes into storage, with the earliest movements out of store in November, continuing through the winter to March/April the following spring. Storage temperatures range from 7.5-12°C, depending on the variety being stored, so controlling sprouting is something he must keep in hand.

“We use MH alone on the crops for short-term storage but for those in store for longer, we use ethylene for one customer and mint oil for another to burn off sprouts in store.”

Biggest challenge

Andrew finds the biggest challenge with MH is to get it on at the right time without getting any knock-back, particularly on unirrigated crops in a hot, dry season. “I’ve seen dormancy break in the field in some varieties as early as July when temperatures have been high and it’s dry. MH application is much easier on irrigated crops.”

With MH the foundation to his sprout control, Andrew has been paying attention to detail as he learns how to get the best out of the chemistry on different varieties. “Last year we may have gone too early on some Innovator, which is a determinate variety and looked as if it was starting to go over. In hindsight we were probably 5-7 days too soon,” he says.

In contrast Andrew feels he got the MH application ‘spot-on’ in Brooke and Taurus and had no need to follow up with a sprout suppressant in store until February. He did, however, see some knock-back in Royal after application which he says was applied later than the crisping varieties as it is a longer-season determinate variety. When the MH timing was reached for the Royal, it coincided with a period of high temperatures.



Andrew Wilson believes a more scientific approach is required to establish the best time to apply maleic hydrazide.

To help alleviate the knock-back Andrew tried splitting the dose and found this helped so it is something he intends to look at again this summer. “Lessons were learned last year but whether or not we can do any better will very much depend on the season,” he adds.

Andrew believes the 3-5 week desiccation window prior to MH application is too vague and should be looked at a bit more scientifically. To that end he is monitoring cumulative temperatures this season to give him day degrees. This will allow him to assess the physiological age of the daughter crop (high temperatures speed up physiological ageing).

“I’ve reached this point because we’ve seen dormancy break in the field under hot conditions. MH needs to go on ahead of this point, when tubers are getting close to sprouting, because once sprouting starts in the field, it’s a hell of a job to stop it in store — we no longer have the tools.”

Andrew agrees that there is a balance to be reached because applying MH too early can reduce yield and efficacy, so the timing is crucial. “My view is that it may be better to sacrifice a little total yield to improve the percentage of saleable yield — waste is worth nowt,” he concludes. ■

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Consider the options for burn-down

Cambridgeshire grower Andrew Wadsley says that this year has been an opportunity to consider alternatives for his potato crop destined for the chipping market. As a supplier of high quality contract and free buy chipping potatoes to markets throughout the country, he has to be able to guarantee a long term supply of product and this means that correct storage is critical.

Wadsley Bros is based at Thorney Toll near Peterborough, Cambridgeshire and is where Andrew and his cousin Phillip grow 50ha of Markies and Agria on unirrigated land. Around a third of the total tonnage is sold on contract. Yields average around 45t/ha, although very challenging weather conditions in 2020 saw the average drop to about 40t/ha.

To make sure potatoes enter storage in the best condition possible, Andrew's focus has turned to desiccation practices. Historically the crop would have been sprayed off with sulphuric acid, but after its revocation the business switched to programmes that included diquat and the PPO desiccants — carfentrazone-ethyl (Spotlight Plus) and pyraflufen-ethyl.

"Tuber detachment is essential for potatoes going into store and all of our potatoes are stored," he says. "We start marketing in November, but we'll keep longer-term stored potatoes until July. Markies and Agria are high yielding, but they can have storage issues, so the desiccation process is critical to keep the integrity of the potato for as long as possible. The quality of potatoes going into store is even more critical, of course, because of CIPC's demise."

With the loss of diquat and other options somewhat limited, the decision was taken to invest in a Scotts mechanical flail topper in

partnership with two neighbours. But the weather scuppered plans and was ultimately too wet to flail when it was needed in 2020.

"If desiccants don't work then the business has the option of using the topper," says Andrew. "It's been a very steep learning curve, and we have to be open minded. We bought the topper so that we are in control of lifting dates, rather than having to rely on the contractor.

"Spotlight Plus remains our first line of attack to knock down haulm," he says. "But the flail is a back-up if needed. We rely on Spotlight which does a good job of knocking over the canopy and results in fast stolon detachment, the latter being essential if the crop is destined for long term storage."

All agrochemical decisions are based on advice from Frontier agronomist Harry Pitcher. "We have always been agronomist-led when it comes to critical spray decisions," says Andrew. "Last year our desiccation programme was based on pyraflufen-ethyl as a first application, followed by Spotlight Plus. Compared with sulphuric acid, any alternative is going to have its work cut out to compete, but to be fair the combination works well."

This year for the first time, following discussions with FMC commercial technical manager Jeff Fieldsend, a decision was taken to drop pyraflufen-ethyl and just use Spotlight Plus for the first application.

"Pyraflufen-ethyl needs the addition of oil to see the full benefit of the product whereas Spotlight needs nothing to maintain a high level of performance," he explains. "Spotlight has worked especially well on some of our better fields where yields can be higher than average, but especially where Markies has been grown, which is a variety that carries a lot of dense green top and it can take some killing."



To make sure potatoes enter storage in the best condition possible, Andrew Wadsley's focus has turned to desiccation practices.

For the past decade the farm's desiccation programme has used high water volumes — 300 l/ha — applied through Lechler 05 twin action nozzles and Andrew believes applying Spotlight early in the morning, when there's still dew, aids the spread of the chemical on the leaf.

"This year the Markies really needed Spotlight and although the crop was still green for some time after spraying, the product did an effective job of detaching the stems from the tubers. We had also taken the decision to use the flail after applying Spotlight but in the end the weather turned, which meant land travel was not an option.

"Our preference is not to flail if we can help it. It's another operation to have to organise and it means more travelling on the land which we are keen to avoid, especially on the heavier soils."

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