

Inta-Ag Mag

DECEMBER 2021



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Christmas
Everyone!*

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ON OFFER**

Page 9

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**DIRTY DOG SUNGLASSES
WITH EVERY SOLIVGO
PURCHASE**

Page 6



POTATO REVIEW | JULY/AUGUST 2021

Sprout suppression starts in the field with maleic hydrazide

As we approach the final stages of the 2020-21 storage period. Potato Review finds out how growers have managed sprouting in the first year without CIPC.

THERE is a consensus that potato sprout control now starts in the field following very positive results from a timely application of maleic hydrazide before haulm destruction last summer.

Many column inches have been dedicated to the subject in recent years, initially covering the uncertainty around long-standing in-store treatment CIPC and how the industry might prevent its withdrawal.

Once that was announced, there followed a knowledge exchange drive to help growers manage sprouting in store without the safety blanket of three or four CIPC applications.

What has now emerged is the importance of maleic hydrazide as the first step in sprout control programmes, which must begin before the crop is even lifted from the ground.

That's according to agronomy group Frontier's crop protection commercial manager Nick Badger, who says there was a huge uptick in its use in potato crops in 2020, mostly on the processing side, but also in crops destined for packing.

NERVOUSNESS

While CIPC's withdrawal was the obvious driver, he says there was also nervousness about relying solely on products growers and store managers had no experience with.

"For many, it was the first year using mint oil or an ethylene system. There has also been uncertainty about the availability of DMN (1,4-dimethylnaphthalene), with the product still not fully approved for use in the UK," he said.

"This meant that not only was there more focus on the use of maleic hydrazide to help manage sprouting early in the storage period, but also the acceptance that application must be spot on to maximise efficacy."

Nick says reports on the efficacy of maleic hydrazide have been very positive and attributes this to increased attention to detail ahead of application.

Because growers have just one shot to get it right, he says many carefully

identified the "sweet spot" – a window about three to five weeks prior to haulm destruction.

"Planning was much better, along with monitoring of weather and managing other jobs that can impact on uptake of MH by the crop, such as irrigation.

"In the past, it has often been an afterthought, because everyone had the insurance that CIPC could get you out of trouble."

FARM FACTS

- 1620ha of owned and contracted land
- Soils range from sandy loam to sandy clay loam
- About 180ha of processing potatoes grown for McCain
- Varieties include Shepody, Innovator, Russet Burbank, Maris Piper and Royal
- 50% of the crop goes into long-term box storage (Russet Burbank and Maris Piper)

SPRAYER EFFICIENCY

Nick says sprayer efficiency has also been key to helping growers apply MH during the sweet spot and improvements have been seen with newer liquid formulations like Crown MH.

The long-established wettable granule formulation of maleic hydrazide, Fazor, requires the operator to rip open and tip multiple 5kg packs each treating up to 1ha.

As these granules need more aggressive agitation to ensure they are fully dissolved, it is also prone to foaming, which can slow the filling process further.

Nick says using a liquid formulation almost completely eliminates this issue, with 20-litre packs or 600-litre IBCs of Crown MH allowing the operator to just fill and go.

A new label requirement this year sees the IBCs combined with a FasTran 850 closed transfer system, which simplifies and speeds up the filling process further still.

"It means the operator can draw the chemical straight out the IBC and into the sprayer at the same time as the water, so once everything is in the tank, it's simply a case of detaching the pipes and off you go," said Nick.

"It's estimated that one to two extra loads a day can be achieved using the system, which is vital when you have a narrow window of application."

'MORE EFFORT PUT INTO PLANNING'

Norfolk grower John Benton focused more attention to application of maleic hydrazide this year, with its role in his sprout suppression programme more prominent than ever.

Growing about 180ha of processing potatoes exclusively for McCain, about 50% of his crop – made up of Russet Burbank and Maris Piper – goes into long-term storage.

In the past, the business has used CIPC to good effect, fogging its ambient box stores three or four times to control sprouting before those crops are moved between January and May.

This reliance on CIPC ended in 2020, with John switching to ethylene gas delivered by the Restraine system as the main in-store sprout control method.

MALEIC HYDRAZIDE APPLICATION CHECKLIST

- Treat healthy and actively growing crops
- Apply 3-5 weeks before haulm destruction
- Spray on a cool day (<25C) when RH is >50% and no rain forecast for 24 hours
- Avoid using mixing partners where possible
- Use a higher water volume – 300-500-litres/ha recommended
- Reduce forward speed of sprayer to 8-12kph

"Not only was there more focus on the use of maleic hydrazide to help manage sprouting early in the storage period, but also the acceptance that application must be spot on."

- Nick Badger, Crop Protection Commercial Manager, Frontier

The farm has used maleic hydrazide in crops destined for long-term storage for several years, but timing tended to be dictated by tuber size and ensuring as many were in the marketable fraction as possible before spraying.

"Last year, we took notice of all the guidance coming out of the AHDB and recognised the need to maximise efficacy. We put a lot more effort into planning application than we had before," said John.

This meant predicting harvest date for each crop, counting back to expected skin set, then haulm destruction date. This calculation provided the farm with a window three to five weeks prior to flailing.

EARLY STARTS

John said all his MH was applied in the last week of July and first week of August, with the sprayer operator starting very early in the morning to avoid the heat of the day.

A much higher water rate was used than previously and no irrigation water was applied 48 hours before or after application.

All these factors optimised leaf coverage and the spray solution dried slowly on the leaf, maximising uptake by the plant.

"We stick to a minimum of seven-day intervals with our blight programme and worked with our agronomist Matt Taylor to apply the MH as a standalone product in between sprays to avoid any interference with uptake," said John.

The farm also took advantage of liquid maleic hydrazide formulation Crown MH last year, having a 600-litre IBC at the spray store where the bulk of the filling took place. For outlying crops, 20-litre packs were used.

"It has been much easier to handle than lots of boxes and we'll certainly be using the IBC system again this year," John said.

In the past, John said it has been hard to tell how much sprout control the maleic hydrazide was providing, as CIPC programmes would start relatively soon after store loading.

It was similar during the 2020-21 storage period when the Restraine ethylene system was switched on early.

However, in a shared store where some of the farm's Maris Piper was held alongside 500t of crisping potatoes, ethylene wasn't an option owing to concerns over its impact on fry colour.

NO SPROUTING

As the crispers were not loaded out until Christmas, the store remained untreated, and no signs of any significant sprouting was observed, and John believes they would have held for a few more weeks with MH alone.

Ethylene was used soon after to see out the remainder of the season and the combination of Crown MH and ethylene as an in-store treatment has provided equal control to anything achieved with CIPC.

John's feeling is that the combination has been slightly cheaper than previous CIPC programmes in some stores and significantly cheaper than if the farm had relied on mint oil.

"We are confident about the job maleic hydrazide has done for us, particularly after seeing what it achieved with the Piper in the co-operative store.

"There is no reason why it won't remain the backbone of our sprout suppression programmes for the foreseeable future."

'MINT OIL COSTS TOO HIGH'

Keeping a lid on storage costs is the significant factor in Adam Palmer's use of maleic hydrazide, with 50-60% control of volunteers in following crops also critical in the farm's IPM strategy.

His business, Fenland Farmers Ltd based in Ely, Cambridgeshire, grows 200-220ha of processing potatoes each year on organic soils around Ely, with most of its produce going into bags for the chip shop trade.

Everything is harvested in October, graded into boxes and stacked in several stores, all of which have been upgraded in recent years to comply with CIPC stewardship requirements.

As a result, most have good airflow, auto control and refrigeration, allowing them to be kept at a constant temperature, but because processing crops need to be stored at 8-10C, all four varieties Adam grows can have sprouting issues.

Historically, Adam has spent £5-£6/t using CIPC, but this year they switched to mint oil as a direct replacement and total costs increased to £20/t, as four to five applications have been used.

Cheaper alternatives such as ethylene cannot be used by us as they have a detrimental effect on fry colours. He says DMN would be a good alternative and is more competitively priced, but approval for 2021 looks unlikely.

That's why he believes maleic hydrazide is now essential in sprout control programmes.

"It will vary between varieties and years, but realistically you can expect MH to give good control until January.

"Nobody [except the grower] will absorb the extra cost of mint oil, so we have to find a way to delay the need for other treatments and negate that expense. We are now reliant on MH to do that."

"Nobody [except the grower] will absorb the extra cost of mint oil, so we have to find a way to delay the need for other treatments and negate that expense."

- Adam Palmer, grower



VOLUNTEER CONTROL

The farm has been an advocate for a number of years, with on-farm trials showing 50-60% reduction of volunteers in following cereal crops.

In an area of intense potato production, this helps manage PCN, virus and soil-borne diseases, which are all perpetuated by volunteers.

Adam has gained experience in how best to apply MH over a period of time and stresses the importance of crop condition at application.

He says the crop should be growing well and free from stress, particularly heat stress. Tuber residue testing this year has shown better distribution of MH where the crop was more vigorously growing.

Users may also want to consider tuber size at application more carefully and avoid spraying where there are significant numbers below 25mm.

"We have seen that although they keep growing, absorption is always lower and that can cause issues in store. Fortunately, we don't often see that, as our maincrop varieties tend to be treated in late August."

Another key factor is how the maleic hydrazide application dovetails with blight programmes.

Adam stresses that it should be applied as a standalone application and protectant fungicides such as mancozeb avoided for at least four days either side of spraying.

"We've certainly noticed that it can prevent uptake, but it won't be available after this year so won't always be a major concern."

WEATHER CRITICAL

He points out that weather plays a more important role and aiming for no rain or irrigation for 24-48 hours after application is advisable to allow the product to be absorbed through the leaf.

This means sprayer output is king when MH timing comes around and switching to liquid formulation Crown MH sped up sprayer filling times last year.

"The granular formulation works fine, but when you get it in the sprayer it froths up and we've tried most things, including anti-foaming agents, but can't stop it completely.

"We've found that Crown MH doesn't foam as badly, and it has also been much easier to handle."

Adam will be ordering Crown MH again for 2021 in 600-litre IBCs with delivery into the sprayer via a retrofit connector compatible with the Fastran 850 closed transfer system.

The system is known to speed up filling, reduces operator exposure risk and cuts packaging waste, with a specialist contractor collecting empty IBCs free of charge for recycling. ♦

FARM FACTS

- Farming 1,600ha of predominantly black fen soils (50% owned, 50% contracted)
- Grows 200-220ha of potatoes for chip shop trade
- Varieties include Markies, Agria, Maris Piper and Sagitta
- Refrigerated box storage houses crop until following summer



Understanding Potatoes

SHANE SMITH - INTA-AG LTD

So here we are again as the months fly past, discussing spuds.

Spuds fascinate me because every year the seed is different in some way and this year's crop has a slightly different personality compared to last year. I think I know it well but there's always something different going on.

Our crop is meeting down the rows and we need to figure out what it needs to maximise its potential.

Determinant and Indeterminant varieties are not discussed much in our crops but is still a good guide to our crops' personality.

Examples of this are Moonlight and Agria. Moonlight is a free spirited character who needs careful timing of inputs otherwise it is slow to bulk tubers, has several sets and a massive canopy

often leading to poor yields even if it looks fabulous. They call this an Indeterminant variety. With these types of varieties, it's best to limit Nitrogen early on until the crop has a good tuber set, up to 20mm, and a moderate to good canopy before topping up Nitrogen.

Agria on the other hand, is all about business. It wants to get on with bulking spuds as soon as possible so if you delay on producing a good canopy quickly, it's hard to get longevity out of the crop and ultimately, a big yield. If you can get a big canopy on Agria, you have a winner! Agria is a more Determinant variety. With these types of varieties, early Nitrogen is needed to establish a good canopy before the crop switches to tuber production.

Strange things these spuds, taste good though. ♦

Regards

Shane

Garlic-based nematicide shows promise for Yorks root grower

FARMERS WEEKLY UK | APRIL 2021



The control of free-living and root-knot nematodes is a problem for many vegetable growers, particularly as the mainstay nematicide Vydate (oxamyl) was withdrawn from use last December.

Despite its loss, a fully registered, granular nematicide formulated from garlic is proving effective in reducing nematode populations on one Yorkshire farm.

Left untreated, the soil-borne microscopic pest feeds directly on crop roots, which distorts and disfigures the root known as “fanging”. This can lead to marketable yield losses of 30-40%, as crops fail to meet tight supermarket quality specifications.

Even with nematicide treatments, carrots can still experience marketable yield losses of 5% and parsnips 8%, so keeping on top of root defects by preventing nematode build-up is important.

NEMGUARD AT POSKITT

The granular product, Nemguard DE, contains 450g/kg of active ingredient and is based on modified garlic extracts, which contain polysulphide chains.

Developed by chemical manufacturer Certis, and approved for organic use, the formula interferes with the nematode’s biochemical processes, causing it to die. This contrasts with Vydate, which only ever stunted the pest.

Specialist root crop grower MH Poskitt, based in the East Riding of Yorkshire, is one family farming business with particularly good experience using the product. Nemguard has been used across the farm’s 130ha parsnip area for more than five years, and has maintained levels of nematode damage within the expected range.

This season marks the first time the nematicide will be used on its 445ha carrot crop, where about 80% of the area is to be treated, explains vegetable farm manager James Bramley.

If left untreated, the business would be at risk of losing 10-20% of its marketable carrot yield, which annually supplies the UK’s leading supermarkets with 50,000t of carrots and more than 65,000t of total vegetable crops.

“Nematodes really are a major, major pest for us,” he reports. “On a brow of a hill, with extremely sandy soils, we could even see up to a 50% loss in marketable yield,” he says.

FARM FACTS: MH POSKITT

- Family business, managed by Guy Poskitt, who won 2012 Farmers Weekly Farmer of the Year
- Owned, rented and contract farmed land across Norfolk, Suffolk, Nottinghamshire, Yorkshire, Lancashire and Scotland
- Supplies the UK’s leading supermarkets with vegetable crops via a range of owned, rented and contract farmed land across the UK
- Produces annually: 50,000t of carrots, 9,000t of parsnips, 5,000t of swedes, and 2,000t of potatoes

APPLICATION

As with Vydate, Nemguard is applied as an in-furrow treatment at the time of drilling, with the same rotors and cassettes fitted, with the exception that applicators must be recalibrated to deliver the appropriate 20kg/ha dose rate.

“For us, Nemguard will be the direct replacement for Vydate as it can be applied with the same machinery at the time of planting,” says Mr Bramley.

Costing £9/kg, which equates to £180/ha, only one application is required and growers should aim to apply the product as close to the seed as possible.

However, Nemguard is not for use on silt soils, as silt affects the movement of water and, consequently, uptake of the polysulphides.

PARSNIP SUCCESS

Last year, trials carried out by manufacturer Certis at the farm found that applications of Nemguard in parsnips significantly reduced fanging and increased marketable yield by an average of 8t/ha.

About 35% of the crop experienced fanging in the control, while only 20% experienced this when treated, causing a rise in marketable yield from 36t/ha to 44t/ha.

“We find applications in parsnips also bring the added benefit of improved crop germination, as it encourages seedlings to shoot,” adds Mr Bramley.

However, he admits that results can sometimes be a mixed bag, as soil moisture levels are critical for the product’s efficacy.

NEMATODE SYMPTOMS

Apart from causing fanging, free-living nematodes can affect yield by reducing plant populations during establishment.

Feeding by some nematode species can result in suppression of fine root development, leading to stunting of foliage and loss of yield.

VARIABLE RESULTS

Root crop specialist Howard Hinds, from Root Crop Consultancy, highlights how variation in environmental conditions, nematode numbers and the type of species present can impact Nemguard performance.

"In dry seasons, particularly last year, we see how the efficacy of the granular treatment considerably reduces control of nematode populations.

"A good level of soil moisture is required to optimise application during the early stages of crop growth, especially as soil moisture and temperature affect nematode presence within soils," says Mr Hinds, who also works as the farm's root crop agronomist.

Irrigation can, therefore, help improve performance if conditions are dry, although this can be a challenge for farms to achieve during the busy spring period.

SOIL SAMPLING

Analysing the quantity and type of nematode species present in the soil is of significant importance when reducing nematode numbers.

There are three main types of free-living nematode that impact UK carrot and parsnip crops, each in different ways, with varying treatment thresholds, based on a 2002 Horticultural Development Council report (FV232), says Mr Hinds. These are:

- Stubby root nematode Affects the outside of the root with a threshold level of 200 litres of soil, and is the main cause of root fanging
- Root-knot nematode Partially grows inside the roots, where it develops knots and forms egg balls. Low populations can have significant effects, so any sign of these in soils can be problematic
- Root lesion nematode Develops inside the root with a threshold level of 2,500 litres of soil. The effect of these nematodes and other types on root crops is less obvious, but they can have an impact on yield and susceptibility to other diseases.

For the past three years, Mr Bramley and Mr Hinds have worked together, annually sampling carrot and parsnip land to identify high-risk areas and threshold levels to develop a precise nematicide application programme.

"Rather than blanket treating, we're aiming to target crops and cut down on unnecessary input costs, where about 80% of the 445ha carrot crop is expected to be applied with Nemguard this season," says Mr Bramley.

HOW TO SAMPLE

As nematodes frequently move up and down the soil profile according to soil moisture and temperature, optimising the sampling technique is critical for accurate analysis.

Sampling should take place in the spring and autumn, when the soil is moist. It is important not to sample during a continuous cold spell or when the ground is frozen, or during the heat of summer, where soil temperatures reach around 20C, coupled with low rainfall.

A 1kg total sample taken every 4ha from a field, in a "W" formation from the top 10–15cm of the soil, is recommended, using a tool with at least a 25mm aperture (not an auger), as the screwing action can damage free-living nematodes.

"As the organisms are extremely delicate, particular care should also be taken to not damage the soil sample itself," points out Mr Hinds.

He also notes that laboratory turn around of soil samples can take several weeks, so sampling needs to be done well ahead of drilling.

CONTROL OF THE POTATO CYST NEMATODE

The garlic extract nematicide is also approved for use in potato crops for the control of the potato cyst nematode (PCN).

Applied at a higher rate of 60kg/ha, James Bramley is trialling this on a high-pressure potato field to investigate its effect.

"At the moment, there is limited data on the effects of this in controlling PCN, and with Nemathorin (fosthiazate) – the current default – up for renewal in a few years' time, we're taking this opportunity to trial Nemguard out," he says.

OTHER APPROACHES CULTURAL CONTROL

A range of cultural control methods can also be deployed to help combat nematode populations, since the sole use of nematicides is not a silver bullet for the pest's control.

Where possible, lengthening the rotation can be beneficial, and avoiding host plants – such as carrots, parsnips, sugar beet, peas, beans and potatoes – can limit the damage of free-living nematodes. Just one additional year can help reduce pest build-up.

Mr Hinds advises growers to drill as late as possible to avoid high soil-moisture levels which nematodes thrive in. However, he admits that with all-year-round carrot supply, this is obviously not possible in some situations.

Cover crops are another effective method to naturally decrease pest pressure.

"Growers have increased interest in using cover crop mixes ahead of the crop for their potential to reduce free-living nematodes. Getting the right mix is important and they can be difficult to plan in, as the majority of fields are on rented land," he says.

COVER CROP TRIAL

This year, MH Poskitt is trialling two different cover crop species in 4ha plots across Lincolnshire, East Yorkshire and North Yorkshire, to assess the potential of the control method in reducing nematode pressure.

"We're starting off with a low percentage of the overall total carrot area grown, with the aim to increase this if things go well," says Mr Bramley.

A green mustard crop will be planted mid-summer, acting as a bio-fumigant crop, which will be cut and ploughed in. On some cereal land, after harvest, an oil radish crop will also be planted to suppress pest build-up.

"Choosing a neutral cover crop species is important, as some species can encourage other soil-borne diseases." ♦



Top-yielding hybrid may attract heavy land barley growers

FRAMERS WEEKLY UK | JUNE 21

The highest-yielding hybrid winter barley variety on heavy land will be widely available for drilling this autumn, with the added benefit of being the earliest to harvest.

The six-row Thunderbolt from breeder Syngenta, which gained a place on the AHDB Recommended List late last year, shows a yield advantage over all other hybrids on strong land, but is slightly weaker in the straw.

Hybrid barleys make up about 35% of the 350,000ha of winter barley in the ground, and this total winter crop area could rise this autumn due to high current feed barley prices.

Paul Roche, the group's seeds technical manager, says heavy-land farmers can expect a 1.06t/ha yield lift compared with control varieties on the Recommended List, and this will mean an extra £191/ha at current barley prices.

"Thunderbolt stands out for its high yields on heavy land, in combination with its good grain quality," he told a company briefing.

HEAVY-LAND YIELDS

The variety shows a heavy-land yield of 111% compared with fellow hybrids Belfry on 110% and Kingsbarn on 108%, and leading two-row barleys Hawking at 107% and Orwell at 103%, according to the Recommended List.

It has performed well in the north and west of the UK, although its overall fungicide-treated yield at 107% is similar to the older hybrids Kingsbarn and Belmont.

Another aspect to appeal to growers is that it is the earliest to mature of all winter barleys, alongside fellow Recommended List newcomer Kingston, and matches the very early-maturing conventional six-row variety Funky.

It has a strong set of disease resistance scores, with an 8 for mildew, which Mr Roche says may allow growers to avoid a specific mildewicide spray, a 7 for brown rust and 6s for rhynchosporium and net blotch, on a 1-9 scale where 1 is susceptible and 9 shows good resistance.

LODGING SCORE

However, it has the lowest score for resistance to lodge among the hybrids, with a 6, with all other hybrids on 7s and Belfry an 8. Mr Roche says Thunderbolt will "need to have a programmed plant growth regulator approach".

The Recommended List illustrates that Thunderbolt shows 37% lodging without a plant growth regulator (PGR), compared with Kingsbarn at 13% and two-row Orwell down at 2%, emphasising the need for PGRs with Thunderbolt.

It has all the general attributes of hybrids, showing very good competitiveness against blackgrass and other grassweeds, and reflects the improving trend in specific weights, with a value of 69.6kg/hl, similar to other leading hybrids.

In addition, like all hybrid barleys it has a larger root system than conventional

barleys, which may enhance scavenging for nutrients and water, and this could give great resilience during extreme weather and as growers move towards improving soil health and reducing inputs.

"The variety produces reliable and dependable grain quality even in difficult years," says Mr Roche.

SEED AVAILABILITY

Sarah Hughes, the group's hybrid barley marketing manager, says there should be plenty of seed for this autumn's drilling season, and the group is keeping the price of seed unchanged from the previous season. This means hybrid seed will cost about £110/ha, compared with £85/ha for conventional barley seed.

She estimates the winter barley area could edge higher this autumn due to higher grain prices and increased interest in oilseed rape, with winter barley being an excellent entry crop for early-drilled rapeseed.

"The barley price has risen 45% in 12 months, making feed barley a very attractive crop at the moment," she says. Feed barley prices have risen from £128/t in June 2020 to about £185/t currently. ♦

THUNDERBOLT V KINGSBARN

	Thunderbolt	Kingsbarn
Fungicide-treated yield (%)	107	107
Heavy land yield (%)	111	108
Non-fungicide yield (%)	88	85
Resistance to lodging	6	7
Specific weight (kg/hl)	69.6	69.7
Mildew	8	7
Brown rust	7	5
Rhynchosporium	6	6
Net blotch	6	5

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