



Potato open day

Measure for measure

Trials are vital to help overcome the challenges involved with growing a healthy and successful potato crop. *CPM* learns about some of the latest research from a Hutchinson's demonstration day.

By Rob Jones and Melanie Jenkins

Through a series of trials held at A H Worth, Holbeach in Lincolnshire, Hutchinsons is aiming to help growers deal with many of the issues faced when growing potatoes. At a recent demonstration day, a team of experts took delegates through the work to examine how it could help with future crop management.

Some of the challenges associated with post-emergence weed control in potatoes includes safety issues related to specific varieties which can be affected by climatic conditions – something explored in the trials, explains Hutchinsons' Darryl Shailes.

"We're frequently contacted by our growers and agronomists to ask questions around herbicide safety, particularly around metribuzin and bentazone on new varieties, so this trial will help growers to assess any yellowing and/or loss of vigour so they can make better informed decisions," he says.

The trial plots on the site were planted on 8 June with herbicides applied once crops were 15-25cm in height, using the best practice of evening spraying. "Some of the varieties have had some damage, so we'll continue to monitor them to

see whether they grow away."

A further trial being run by Hutchinsons has looked at varietal tolerance and resistance to potato cyst nematodes (PCN). Research into this is particularly poignant given the risk of losing Nemathorin (fosthiazate) in 2024, meaning crops could be exposed without the protection of the high-volume granular nematicide.

PCN trial

The trial involves monitoring 24 varieties, each selected for its resistance status, with Maris Peer used as the control. Plots were planted on 19 April and were divided into two, with one side treated with Nemathorin at 30kg/ha and the other without, and both were irrigated. The background PCN level in the field was 16 eggs/g, but on creating the plots this was then broken down into eggs/g per plot, which ranged from 0.5-20 eggs/g.

Simon Faulkner of SDF Agriculture observed that the variety Paradox is showing resistance as well as a degree of tolerance. Amanda also showed quite good tolerance, but in general the canopies were better where the soil had been treated with Nemathorin (fosthiazate).

He emphasised that results won't be seen until after harvest when a population final/population initial factor (pf/pi) will be done, until then the observations can only reflect tolerance to PCN. And he flagged that 'tolerance' shouldn't be confused with 'resistance', explaining that they aren't linked.

"Tolerant means that a particular variety can still grow well even when under considerable pressure from PCN, so better canopies are only showing the level of tolerance. This is normally accounted for due to their extensive root system.

"When a variety is resistant, it means that nematode multiplication is reduced or prevented, decreasing the viable number of

cysts which form. It's a long-term strategy because the yield in that crop may be reduced if the variety isn't tolerant."

Tolerant varieties can result in significant increases in PCN, and the ideal is to have a resistant variety with a degree of tolerance, he says.

Of the varieties in the trial, he points out the new crisping variety Cinderella, which has resistance to both PCN species present in GB (*Globodera rostochiensis* and *Globodera pallida*), looked to be reasonably tolerant too. "This variety has relatively stable sugars and should go to mid-term storage."

Packing variety Karelia has also been bred for resistance to both species, but looking at the canopy, its tolerance was not quite as robust, he notes.

Simon highlights that Buster is another useful variety as it requires less N inputs than many others, noting that the reason its canopy was still small may be because it's a later maturing variety. "All these plots will be taken to harvest, and we'll then analyse the final population of PCN so that a pf/pi can be calculated. ▶



Darryl Shailes says Hutchinsons is frequently contacted by its growers and agronomists to ask questions around herbicide safety in potato crops.

Taming of the root lesion nematode

Root lesion nematodes (*Pratylenchus spp*) are a persistent issue for potato growers but French marigold (*Tagetes patula*) and oilseed radish have been shown to reduce soil populations of these parasites, explains Vongai Chekanai of Harper Adams University.

The nematodes can enter the haulm and then leave again, causing a wound through which other soil-borne pathogens can enter.

But there is uncertainty around future control because the nematicide Nemathorin is due for renewal in the UK in 2026 and is under review in the EU, and therefore has an uncertain future, which is why Hutchinsons is helping with research into cover crops.

"The different varieties used in cover crops create varying responses from the nematodes; some species can reduce populations by acting

as non-hosts, trap crops, or biofumigants when the right species are used," explains Vongai. "However, other species used in cover crops can act as food for the pest.

"Our trials indicated that oilseed radish and French marigolds were poor hosts and suppressed RLN population numbers, however, Indian mustard, which is popular as a biofumigant to suppress potato cyst nematodes (PCN), increased RLN numbers."

French marigolds release α -terthienyl, a sulphur-containing metabolite from their roots which is toxic to the nematodes. "This means they have good potential for contributing towards nematode suppression," she adds.

Further field trials are planned, and will include French marigold, oilseed radish, alfalfa (lucerne) and forage chicory.



French marigold and oilseed radish have been shown to reduce soil populations of root lesion nematodes, explains Vongai Chekanai.

► "A yield will be calculated from the plants removed from the plots and the tubers size graded into mid-size (<45mm), bakers (65-85mm) and ware," he says.

"There's a proposal to store the prepack varieties in a commercial cold store at 3°C and the processing and chipping varieties in a warm store at 8°C. There can then be

some assessment on dormancy and quality stability during storage." Results are expected to be available later in the year and presented at a later meeting. ■

Much ado about wireworm

Wireworm, which is generally a dominant pest in the West of England, is increasingly being found in the East. The first step to controlling the pest is understanding its life cycle and monitoring its presence ahead of planting potatoes, according to Martyn Cox of Cupgra.

Land that has been in long runs of stewardship, grass, or in min-till with near permanent vegetation is at the highest risk, and surface water adds to this, he says.

Trapping adult wireworm gives an indication of potential egg-laying risk, and adult identification is more reliable than larvae as it's almost impossible to determine the species from these, explains Martyn.

Ploughing and cultivation can help reduce risk when done in the autumn after a cereal crop because pupae and adults are exposed to predation, but if done in December or January they're too deep underground to be affected, he adds.

Martyn points out that all varieties are impacted by wireworm but the range observed in trials is often 30-40% damage in the best-case scenario, and up to 90% in the worst, with the most susceptible varieties receiving more severe damage.

"Glycoalkaloids (nitrogen-containing compounds) and sugar levels have been considered major factors in damage levels," he says. "But recent work has shown this is unreliable. We've seen the same level of damage

in varieties with very different glycoalkaloid and sugar profiles, so it's back to the drawing board. We know some varieties are worse than others, so we'll keep looking.

"Cupgra work this year involves testing a matrix of glycoalkaloids and sugar levels in a range of varieties and hopefully will identify the genetics behind those which are less susceptible to wireworm damage."

According to entomologist Dr Ben Clunie of Harper Adams University, the loss of conventional controls means that uniting knowledge on the pest and alternative control methods will help to find solutions for growers.

This includes building an understanding of where the pest is in the crop. While trapping remains a crucial tool to monitor populations, exploring novel methods such as drones with spectral imaging to use canopy health as a measure of damage would enable more accurately targeted use of controls, he says.

Ben is working alongside Hutchinsons in an Innovative Farmers project to improve understanding about different potential cultural tools for wireworm control.

His other research on the topic includes investigating entomopathogens such as fungi and nematodes. Although there's already a wealth of knowledge, he concedes that these methodologies require improvement because establishing them in the field has proved difficult.

There's currently evidence that chemical



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ecology has attractant and repellent effects, but it also has potential for use as biopesticides or together with entomopathogens, he says.

"There's also evidence of a cultural shift towards cover cropping, and PCN control biofumigants are becoming increasingly popular. But we still have to understand how effective they are in the context of wireworm control, and whether they have better results against the pest at a certain stage in the life cycle. It could be that if we can suppress the newly born larvae there'll be smaller populations coming through."

A project is currently being run with Martyn, Hutchinsons, the Soil Association and others which aims to explore whether younger larvae can be suppressed through cover crops and biofumigants. "This is at a preliminary stage and hopefully could be developed into a multi-year trial," adds Ben.