

BIOLOGY ANSWERS BACK

A new pheromone-based technique is proving successful at controlling *Tuta absoluta* populations while biological treatments against root rot are looking promising in trials, as growers heard at this year's British Tomato Conference

AHDB-funded projects have shown how mating disruption, a technique new to glasshouse production, can contribute to controlling the leaf-mining pest *Tuta absoluta* and how use of microbial-based products might help to suppress root rot disorder.

Integrated pest management consultant Rob Jacobson told the conference that results from using Isonet T, essentially the pheromone produced by female *T. absoluta* moths to attract males, had been 'spectacular'. "They have gone beyond our expectations," he said.

Available from Fargro, Isonet T was approved for use in tomatoes, peppers and aubergines by the Chemicals Regulation Division in January this year – pheromones obviously aren't lethal to insects, but when used for mating disruption they still need to be authorised. It was trialled in work seeking to improve control of the moth because programmes based on the insecticides Conserve and Coragen have broken down on account of the pest starting to develop resistance to their active ingredients.

Released from a dispenser that resembles plastic cabling which is hung from support wires, the synthetically produced pheromone saturates the air in the glasshouse, confusing the males and preventing them from finding a female to mate with. The concentration required to



Dave Kaye:
root rot reduction at one of
the trial sites.

achieve this is far higher than is used in monitoring traps which meant it was prohibitively expensive until a new production method had been developed by its Japanese manufacturer.

In the trials this year on a commercial nursery where the pest was known to be resistant to spinosad, the active ingredient of Conserve, dispensers were put into position at the maximum rate approved of 1,000 per ha either one week before planting or two weeks after planting. "The dispensers are estimated

to last about 135 days – that would have been to the end of May," said Dr Jacobson. "By then, [the predatory bug] *Macrolophus* was numerous, and there were no active mines, so it did what we wanted it to do. There were still no active mines by mid August."

Other members of the Tomato Growers Association have also tested the pheromone for themselves, he said, setting out the dispensers later, in February and March, when moth populations were already at significant levels. "I worried that this might be too late, that the pest had already got a foothold," he said. "But they stopped the



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population growth and there were no active mines at the end of June.”

Dr Jacobson did sound a note of caution, though, in that Belgian research has already shown that some female moths can produce viable eggs without mating. “It is possible that over-use of the product could select for these individuals,” he said. “So only use it as part of an IPM programme.”

Meanwhile, two IPM-compatible insecticides which could substitute for spinosad are to be investigated further in AHDB’s SCEPTREplus crop protection programme.

In the case of root rot, ADAS plant pathologist Dave Kaye told the conference that two products were being trialled at two nurseries this year in AHDB work to find a biological treatment, following last year’s trials which had suggested they had some beneficial effect in suppressing the causal organism *Rhizobium radiobacter*. One is the ‘growing additive’ Carbon Gold Biology Blend, which was applied either at propagation only or at propagation and at planting; the other is a mix of micro-organisms delivered through the irrigation lines. Both nurseries are growing on coir.

No reduction in incidence or severity of the disease has been observed at one of the sites — in fact incidence inexplicably increased in plants treated with the micro-organism mix. But by late summer, disease incidence

and severity had been significantly reduced in a Funtelle crop at the second site where plants had been treated by the micro-organism mix and in a Piccolo crop with Carbon Gold.

“When Carbon Gold was used both at propagation and planting, it significantly reduced the incidence of root rot in Piccolo plants at one of the trial sites,” said Mr Kaye.

He told *The Commercial Greenhouse Grower*:

“This shows there’s a potential treatment for propagators of young plants in the UK and the Netherlands as a way to address root rot occurring in the season ahead. Further tests are planned on plants being propagated in the 2018 season.”

Plants in the trials have also been screened with the molecular diagnostic test that Fera has developed to pick up infection before symptoms become visible and which



Rob Jacobson:
spectacular results with
mating disruption.

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will be helpful in screening at the propagation stage. "We took samples of roots as plants arrived [on the nurseries] and did see infection in untreated plants at one site," he said.

He added: "Infected roots were found in all treatments at the first in-crop assessment at one site and in all plots at the second site. There is more disease out there than we realised."

The test detects the plasmid – the short lengths of DNA carried by the Rhizobium bacterium which become incorporated into the plant's cells and is responsible for the root proliferation – rather than the bacterium itself. With some nurseries finding the disease difficult to control from one year to the next, other questions the project hopes to answer include whether the plasmid can survive in the environment in the absence of Rhizobium and how effective biocides are against both the bacterium and the plasmid.

Better biological solutions are also the focus for AHDB's 'Amber' project – on getting the best from biopesticides in protected cropping. After studying how well biopesticides were applied in terms of, for instance, product deposition and persistence, when nurseries follow best practice guidelines, work this year has centred on how applications can be improved. From the results so far, researchers have

found a lack of scientific knowledge on dose, persistence and coverage which will affect timing and frequency of applications, said project leader Dave Chandler of Warwick University. "How long [microbial products] last on foliage will drastically affect performance," he said.

Dr Chandler added that the effectiveness of microbial biopesticides is linked to the size and structure of a pest's population. They work far less quickly than their chemical counterparts, so although they will hold the pest back when populations are at low levels, they have to be highly effective to have any hope of impacting on the pest when numbers are high. And because some products don't kill a pest in the first stages of its life-cycle, there's less time to knock it out to prevent it from reaching maturity and reproducing. "Computer modelling will predict how these factors affect a biopesticide's performance," he said.

Another area that needs addressing is the instructions available to growers on how to apply biopesticides. Taking one example, Dr Chandler questioned what was meant by spraying to 'just before run-off'. "To most people it means really wet," he said. "But at too high a volume most of the product will end up on the floor."

Experiments at Silsoe Spray Applications Unit in Bedford will identify how much water is needed for effective applications and the best way to deliver the required dose to the target so recommendations can be made on spray equipment, nozzles and volumes. "We think we can get growers big savings on application costs just by making some basic adjustments," he said.



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Change to bumblebee rules means 'more hives and more monitoring'

Tomato growers are having to bring in more hives and use more labour to monitor fruit set after being required by Natural England to use only the native sub-species of bumblebee, *Bombus terrestris audax*, for pollination. As part of an AHDB project, Rob Jacobson has interviewed growers to see how they are faring with the new regime since it was introduced three years ago. He told the Tomato Conference that two-thirds of those surveyed believed the native sub-species performed less well than the two non-native sub-species they had previously depended on.

He said most growers consider *B. t. audax* is more likely to fail if conditions were less than optimal and that 50% believe colonies have a shorter life.

But on a positive note, Dr Jacobson said the native sub-species' breeding stock appeared to be getting stronger.