Grower Summary

SF 133

Optimising tarsonemid control on strawberry using predatory mites

Final report 2015

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Use of pesticides

Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

Before using all pesticides check the approval status and conditions of use.

Read the label before use: use pesticides safely.

Further information

If you would like a copy of this report, please email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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Project Number:	SF 133
Project Title:	Optimising tarsonemid control on strawberry using predatory mites
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Contractor:	East Malling Research
Industry Representative:	Harriet Duncalfe
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Project Cost:	£66,430

GROWER SUMMARY

Headline

- *Neoseiulus cucumeris* and *Amblyseius barkeri* have potential as effective treatments for control of tarsonemid mite infestations in strawberry.

Background and expected deliverables

The strawberry tarsonemid mite, *Phytonemus (Tarsonemus) pallidus ssp. fragariae*, sometimes called the strawberry mite, is a serious pest of strawberry. It feeds mainly on the upper surfaces of the young folded leaves of strawberry, making their surfaces rough and crinkled as they expand. Sometimes the leaves turn brown and die and the whole plant usually becomes stunted. Mites also feed in the flowers and fruits seriously affecting yield and quality.

There has been a significant increase in the frequency and severity of attacks in UK strawberry production in the last few years. The problem was particularly severe in 2010 and 2011, and continues to be a problem in some crops. Strawberry tarsonemid mite is difficult to control as most acaricides are contact acting with no or, at best, limited translaminar activity. The mites are readily controlled when directly intercepted by an acaricide, but penetration into the young folded leaves where the tarsonemid mites live and breed is limited, spray penetration being the chief factor limiting efficacy. Furthermore, strawberry leaves are waxy and covered in hairs, and many products are not specifically formulated for the crop and have insufficient wetting properties.

The overall aim of this project was to identify effective predatory mites for prevention and control of strawberry tarsonemid mite in polytunnel and glasshouse crops and to improve application timing and treatment methods.

Summary of the project and main conclusions

In 2012, six predatory phytoseiid mite species were evaluated for their effectiveness at controlling strawberry tarsonemid mite at low and high temperatures, for use in polytunnel and glasshouse conditions. Results from the glasshouse trial were hindered by low numbers of tarsonemid mites in the control plots. Significantly less tarsonemid eggs were found in the control plots and those treated with *Neoseiulus californicus,* compared to those treated with *Amblyseius swirskii* or *A. montdorensis*. However, more predatory mites were found on the plants treated with *A. swirskii* and *A. montdorensis* compared to *N. californicus* and the

untreated control. A summer polytunnel experiment gave more promising results with fewer tarsonemid mites in the cages treated with *A. barkeri* or *N. cucumeris* compared to *A. andersoni* or the untreated control.

The polytunnel trial in 2013 consisted of 7 treatments. *A. barkeri* and *N. cucumeris* were tested as preventative and curative controls for strawberry tarsonemid mite (curative controls were applied as one or two releases). Predatory mites were found in the plots before the treatments had been applied. Both species of predatory mite (*A. barkeri, N. cucumeris*) appeared to suppress introductions of tarsonemid mites made post predatory mite release. Numbers of tarsonemid mites in the untreated control plots remained constant even though *A. barkeri*, *N. cucumeris* and *N. californicus* were recovered from these plots in substantial numbers. One or two releases of either *A. barkeri* or *N. cucumeris* reduced numbers of tarsonemid mites in the plots. In 2013 higher numbers of *A. barkeri* were recovered from all treatment plots compared to *N. californicus* and *N. cucumeris*. This may be due to the fact that the same site was used, with the possibility of overwintering of the *A. barkeri* from the 2012 experiment.

In 2014, the experiment was, again, in a polytunnel, on strawberry plants in grow bags. *A. barkeri* and *N. cucumeris* were applied as preventative and curative treatments, with a single inoculation being used. As with the 2013 experiment, predatory mites were found in plots ahead of inoculation. In the 2014 trial there were few significant differences between the treatments of predatory mites and the untreated controls. The numbers of tarsonemid motiles were generally low in the preventative experiment. Establishment of both species of predatory mites was seen with a significant increase in eggs of predatory mites over time in the curative experiment (although numbers were low). There was also a significant increase in predatory mites over time in the preventative experiment and significantly more mites where released.

The overall results from the project show that in the glasshouse experiment, less tarsonemid eggs were found where *N. californicus* was introduced (*N. cucumeris* was not a treatment in the glasshouse experiment). Results from the polytunnel experiments show that *N. cucumeris* remains suitable as a preventative and curative treatment. Similarly, *A. barkeri* also established and suppressed populations of tarsonemid, although this species is not marketed in the UK.

A review of the data available on chemical treatment effects on predatory mites in strawberry was completed by Michelle Fountain and Nathan Medds (Syngenta Bioline) in Year 2 which is available on request from HDC.

Financial benefits

Strawberry tarsonemid mite can cause devastating crop losses in highly valuable protected strawberry crops; losses exceeding £10,000 per ha per annum in some instances. New effective predatory mite species and more accurate timing of application of predators with the most effective species for the time of year, will reduce populations of tarsonemid mites in strawberry crops reducing the need for chemical applications.

Action points for growers

- Results from these studies suggest that *N. californicus* is to be recommended as an effective treatment for tarsonemid mites in glasshouse strawberry and *N. cucumeris* in polytunnel crops. *A. barkeri* also gave control in polytunnel crops, however it is not currently marketed to UK growers.
- Tarsonemid mite control is difficult once populations have established and, therefore, we would recommend that growers apply predatory mites early in the season before tarsonemid mite populations can build up. Topping up with predators on a planned basis may also be required.
- It is also important that sprays directed against tarsonemid mites ensure good coverage to the crown and young folded leaves of the plants. We would recommend using water sensitive papers to test this and consider the incorporation of a wetter with the plant protection product.
- Growers should follow recommendations for predatory mite release times after a plant protection product application.