Grower Summary

SF 133

Optimising tarsonemid control on strawberry using predatory mites

Annual 2014

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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 the full 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
Project Leader:	Dr Michelle Fountain
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Industry Representative:	Harriet Duncalfe
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Headline

Amblyseius barkeri and *Neoseiulus cucumeris* have potential for curative 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. Because most acaricides are contact acting with no, or at best, limited translaminar activity, it can be difficult to control tarsonemid mite adequately. Although the mites are readily controlled when directly intercepted by an acaricide, penetration into the young folded leaves where the tarsonemid mites live and breed is limited. Spray penetration is the chief factor limiting efficacy. In addition, 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 is 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. However, significantly more tarsonemid eggs were found in plots treated with *Amblyseius swirskii* or *A. montdorensis* compared to those that were treated with *Neoseiulus californicus* and the untreated control. The reason for low numbers of tarsonemid mites on the control is not known, but there were more aphids (although not significant) on control plants so there may have been an interaction between the plant and the two pest species. The summer polytunnel experiment gave more promising results with fewer tarsonemid mites in the plots treated with *A. barkeri* or *N. cucumeris* compared to *A.andersoni* or the untreated control.

The polytunnel trial in 2013 consisted of seven treatments in a randomised block design. *A. barkeri* and *N. cucumeris* were assessed as preventive and curative controls for strawberry tarsonemid mite. The curative controls were applied as one or two releases. There were six replicates per treatment and 10 plants per 1 m grow bag. Each grow bag was a plot and was contained inside a double fleeced open top cage with grease around the top to prevent mites escaping. A pre-assessment and two or three assessments post treatment application (predatory mite release) were made and predatory mites recovered were identified to species.

The trial was hampered in the early stages by the late onset of warm temperatures and the presence of various species of predatory mites in the plots before the treatments had been applied. Both species of predatory mite (*A. barkeri,* and *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.

Although predatory mites (*A. barkeri, N. californicus* and *N. cucumeris*) were found in all plots on all dates, even before the treatment application, they are not restricted to the young folded strawberry leaves and, therefore, may disperse not only over the entire plant but beyond. Drawing conclusions from numbers of predators on young folded leaves is not a reliable way of estimating predatory mite numbers. We hypothesise that higher numbers of predatory mites were recovered from the untreated control because this was where higher

concentrations of tarsonemid mites were found. Higher numbers of *A. barkeri* were recovered from all treatment plots compared to *N. californicus* and *N. cucumeris*. However, this dissimilarity could be due to behavioural differences between species rather than estimates of true densities. Large numbers of *A. barkeri* could have overwintered on the site from the 2012 experiment.

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 this study and the study in 2012 suggest that *N. californicus* is to be recommended as an effective treatment for tarsonemid mites in glasshouse strawberry and *A. barkeri* and *N. cucumeris* in polytunnel crops.
- However, 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.
- 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 pesticide.
- Growers should follow recommendations for predatory mite release times following a pesticide application.