



# Grower Summary

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## **TF 219**

Control of two-spotted spider mite (*Tetranychus urticae*) on protected cherry using the predatory mite *Amblyseius andersoni*

Annual 2016

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The results and conclusions in this report may be based on an investigation conducted over one year. Therefore, care must be taken with the interpretation of the results.

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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 AHDB Horticulture office (hort.info.@ahdb.org.uk), quoting your AHDB Horticulture number, alternatively contact AHDB Horticulture at the address below.

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AHDB Horticulture is a Division of the Agriculture and Horticulture Development Board.

**Project title:** Control of two-spotted spider mite (*Tetranychus urticae*) on protected cherry using the predatory mite *Amblyseius andersoni*

**Project number:** HDC TF 219

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**Report:** Year 2 Report 2015

**Previous report:** Year 1 Report 2014

**Key staff:** Alvaro Delgado

**Location of project:** East Malling Research

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**Date project commenced:** 1 April 2014

**Date project completed** 31 March 2017  
**(or expected completion date):**

# GROWER SUMMARY

## Headline

- *Amblyseius andersoni* introductions made at a rate of one Gemini sachet per 5 cherry trees under protection dispersed evenly across the trees giving the potential to control pest mites.

## Background and expected deliverables

Growing cherries under protection brings benefits of consistency of supply by reducing fruit splitting caused by frost and rain damage. However, the increased temperature and humidity under tunnels also causes problems including pests and diseases which thrive in these conditions.

Pest mites on cherry include two spotted spider mite (TSSM, *Tetranychus urticae*) and the European red mite (*Panonychus ulmi*). Due to the warm, dry conditions in protected cherry there has, in recent years, been a build-up in *T. urticae* close to harvest causing bronzing of the leaves and webbing. This was particularly problematic in 2013 when warmer dryer weather conditions promoted the population growth of *T. urticae* on cherry trees in tunnels. There was concern by agronomists that this may affect the subsequent years' bud growth. Currently approved crop protection products on cherry for spider mite control are either damaging to natural enemies, have short persistence or have excessively long harvest intervals.

However, since 2012 the occurrence of the invasive pest, spotted wing Drosophila (SWD), *Drosophila suzukii*, which causes damage to developing fruits, there have been an increased range and number of applications of crop protection products to cherries. It is hypothesised that these products may have detrimental effects on naturally occurring predatory mites in cherry trees, hence, promoting the proliferation of spider mites in the crop.

Many species of predatory mites occur naturally and/or are available commercially. Naturally occurring predators offer some control of spider mites, but there is often a lag between the population build-up of the pest and the predator, resulting in spider mites overwhelming the trees before the predator can gain control.

*Amblyseius andersoni* is a generalist predator and will feed on many mite species including *P. ulmi*. Commercial trials have shown promising results using *A. andersoni* Gemini sachets to control spider mites in outdoor apple trees.

The aim of this project is to test the efficacy of *Amblyseius andersoni* as a preventative and curative control agent of spider mites in protected cherry. In 2015 we aimed to test the curative and preventative potential of *A. andersoni* deployed in Gemini sachets in cherry trees.

### **Summary of the project and main conclusions**

In 2014 it was demonstrated, in replicated plot trials, that *A. andersoni* deployed in Gemini sachets on every 5<sup>th</sup> cherry tree in 2 protected orchards dispersed evenly resulting in uniform numbers of predatory mites on each tree. Unfortunately, in that year, phytophagous mite populations never developed sufficiently in the untreated plots and hence we could not assess the effects of *A. andersoni* on the pests.

In 2015 we carried out a small plot field trial in a protected cherry orchard at East Malling Research to test the efficacy of the Gemini sachets to control or prevent *T. urticae* population build-up. Three-tree plots of protected cherry trees with 3 guard trees and polythene sheeting on 3 sides to prevent migration of mites were established. The cherry trees either had *A. andersoni* Gemini sachets added and then *T. urticae* (preventative) or *T. urticae* and then Gemini sachets (curative). These were compared to an untreated control where only *T. urticae* was introduced to the trees. The plots were assessed on 3 occasions by ethanol extracting mites from 20 leaves per tree per plot and then counting under a microscope.

Overall there was a very low diversity of Acari (mites) on the cherry leaves; populations were almost completely dominated by *A. andersoni* even after a spray of lambda-cyhalothrin before the trial began. This indicates that there may be at least some tolerance to this crop protection product in this orchard. *T. urticae* did not establish in the cherry trees, even in the control plots which did not receive Gemini sachets. It is believed that this may be because the numbers of *A. andersoni* in this orchard were already at sufficient levels to control the pest. This, at least, indicates that one *A. andersoni* per 4 leaves could be sufficient to control *T. urticae* in the absence of predatory mite damaging crop protection product sprays. Potentially lower thresholds of predatory mites may be sufficient, but this could depend on the time of year and numbers of phytophagous mites already present.

### **Financial benefits**

The economic damage caused by *T. urticae* feeding on cherry has not been estimated, but it led to economic losses in 2013 when some fruit was discarded. Supermarkets demand consistency of supply from year to year and many (e.g. Sainsbury's), are aiming to sell double the volume of UK fruit by 2020. Reliable control of *T. urticae* from early in the season would help to reduce the risk of damaged fruit nearer to harvest.

### **Action points for growers**

- Assess cherry leaves for the presence of predatory mites early in the season – before flower.
- If naturally occurring predatory mites are low or absent in cherry orchards, Gemini sachets can be deployed as soon as the protective covers are placed over the crop.
- Releases of *A. andersoni* in Gemini sachets can be made at one sachet per 5 trees to supplement naturally occurring predatory mites for spider mite control in cherry orchards before programmes of crop protection products begin for *D. suzukii*.
- Consideration of sprays applied for *D. suzukii* (spotted wing drosophila) management are likely to interfere with spider mite control, so supplementing with early, but well-timed predatory mite releases may be necessary to control pest mites before *D. suzukii* becomes a problem.