



Horticultural
Development
Company

Grower summary

SF 81

Developing techniques to
manage raspberry leaf and bud
mite in tunnel produced
raspberry

Final Report 2010

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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.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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Headline

- Dymamec and the predatory mite *Amblyseius andersoni* offer potential control measures for raspberry leaf and bud mite.

Background and expected deliverables

The raspberry leaf and bud mite (*Phyllocoptes gracilis*) is becoming a serious pest in protected and semi-protected production in the UK. Severity of damage is dependent on environmental conditions and variety. One of the most commonly grown commercial raspberry varieties, Glen Ample, has been shown to be very susceptible. Damage can be extensive and result in considerable loss of crop quality and yield. Currently, there are few acaricides approved for use in cane fruit which offer control.

This project aimed to identify new control measures which are compatible with IPM and meet the demand for high quality, pesticide residue free fruit.

The expected deliverables from this work include:

- An evaluation of available acaricides for their effectiveness at controlling the raspberry leaf and bud mite and their effect on predator species.
- An assessment of the efficacy of predatory phytoseiid mites.
- An investigation into new approaches to managing mites under tunnel production.

Summary of the project and main conclusions

2007

Evaluation of acaricides and predatory mites

In 2007 several products were tested in a commercial plantation to assess their efficacy at controlling raspberry leaf and bud mite. These included Dynamec (abamectin), Masai (tebufenpyrad), Agri-50E (a seaweed based compound) and predatory mites (*Amblyseius andersoni*).

- Dynamec showed potential as a control method for the raspberry leaf and bud mite.
- Masai and Agri-50E displayed very variable results.
- The predatory mites were unsuccessful.

Varietal susceptibility

Varietal susceptibility was investigated in a mesh tunnel. Eight raspberry varieties and a hybrid were assessed. Malling Landmark and Tayberry were the most susceptible. Autumn Bliss was the least susceptible. It was hypothesised that leaf or bud morphology may be important in controlling susceptibility.

2008

Evaluation of acaricides at a commercial site

An experiment was set up at a commercial site to assess whether Dynamec on its own would be successful at controlling the raspberry leaf and bud mite or if a combination of products (Masai and Dynamec) were required to gain successful control. Unfortunately, the results were very variable and no conclusions could be drawn.

Evaluation of acaricides in a mesh tunnel

The efficacy of products was tested in a mesh tunnel to provide a more controlled environment. There were 4 different combinations of products tested; Dynamec, Dynamec with Agri-50E, Floramite and Floramite with Agri-50E.

- Dynamec greatly reduced the numbers of mites.
- The addition of Agri-50E did not further reduce mite populations.
- Floramite did not reduce numbers.

Mite performance study

Eight raspberry varieties and a hybrid were compared to identify any link between mite numbers and leaf hair density. The most susceptible variety Malling Landmark had the fewest leaf hairs, suggesting a correlation does exist.

Evaluation of predatory mites

A laboratory based evaluation of predatory mites was undertaken which studied the number of raspberry leaf and bud mites eaten by individual predatory mites over a four hour period. Three predatory mites were tested: (1) *Amblyseius andersoni*, (2) *Amblyseius cucumeris*, and (3) *Typhlodromus pyri*.

- All three predatory mites consumed the raspberry leaf and bud mite on raspberry leaf discs.
- *Typhlodromus pyri* and *A. cucumeris* consumed a mean of 8 and 9 raspberry leaf and bud mites out of 20 whereas *A. andersoni* consumed a mean of 17 out of 20 within 2 hours.

The full results of these experiments are set out in the science section of the report and is available from the HDC.

2009

Testing predatory mites at a commercial site

The efficacy of predatory mites at controlling raspberry leaf and bud mite was tested on a large scale at two commercial sites. Commercial sachets of *Amblyseius andersoni* (sold as Anderline aa - each Gemini sachet contains a breeding colony of 200-250 predator mites) were distributed every two metres along three rows in two tunnels at both sites. The number of mites on leaf samples picked randomly from the treated tunnels was compared with leaves sampled from two tunnels that had been subjected to the growers' own standard practice for leaf and bud mite control. Six leaf samples were collected throughout the season.

- After three samplings it was decided to treat all the tunnels with Dynamec as there were large numbers of leaf and bud mite in the tunnels.
- Overall the number of leaf and bud mite in the predator treated tunnels were higher than in the tunnels subjected to the grower's own standard practice.

Testing susceptibility of varieties and the efficacy of predatory mites in a mesh tunnel

This experiment was set up in a mesh tunnel using four different varieties: Malling Landmark, Glen Magna, Glen Moy and Latham. The success of the predatory mite (*A. andersoni*) was compared for the four varieties to identify any link between varietal susceptibility and predatory mite activity.

- The varieties varied in their susceptibility to the leaf and bud mite with Landmark having the most mites and Latham having the fewest.
- The plants treated with predators had far fewer leaf and bud mites, suggesting that in small scale controlled conditions, this predator is successful at controlling the raspberry leaf and bud mite.
- The predatory mites reduced raspberry leaf and bud mite numbers on all varieties suggesting that they are not affected by density of leaf hairs.

Predatory mite feed tests

The two-spotted spider mite (*Tetranychus urticae*) is also a pest of raspberry. Laboratory experiments were conducted to assess the effects of the presence of this pest on the consumption of raspberry leaf and bud mite by the predators; if this alternate prey is preferred by the predator it could influence its effectiveness as a biocontrol agent against raspberry leaf and bud mite. Since *T. pyri* was not the most effective predator in the initial experiments and it is not mass produced for artificial release, these experiments concentrated on *A. cucumeris* and *A. andersoni*.

- In tests where both spider mite and raspberry leaf and bud mite were present there was no apparent preference for either pest by either predator.
- The presence of other prey did reduce the number of raspberry leaf and bud mite consumed compared to the number consumed if they were the only prey present.
- From these laboratory test results, of the predators tested *A. andersoni* appears to have the greatest potential to reduce populations of raspberry leaf and bud mite.
- Although no overall preference for spider mites was seen the presence of alternative prey on plants will be likely to reduce the number of raspberry leaf and bud mite consumed.

Overall main conclusions

- Dyanmec (abamectin) gives good control of the raspberry leaf and bud mite.
- In laboratory feeding tests the native UK predatory mite species *Typhlodromus pyri*, *Amblyseius cucumeris* and *Amblyseius andersoni* all consumed raspberry leaf and bud mites, but *A. andersoni* consumed greater numbers of the pest than the other two species.
- No overall preference for raspberry leaf and bud mite or the two-spotted spider mite was observed in either *A. andersoni* or *A. cucumeris*.

- *Amblyseius andersoni* greatly reduced the number of leaf and bud mite in a small scale experiment.

Financial benefits

There are no financial benefits from this work.

Action points for growers

- The acaricide Dynamec (abamectin) shows great potential in controlling raspberry leaf and bud mite in tunnel produced raspberries. Note that Dynamec is only approved for use under protection.
- The predatory mite *Amblyseius andersoni* shows potential as a control agent for the raspberry leaf and bud mite when tested in the laboratory and on a small scale so could be tested as a control option on growers' own sites using an Anderline aa Gemini sachet every 2 metres.
- Carefully consider raspberry varietal susceptibility to leaf and bud mite when planting in leaf and bud mite susceptible areas.