



NJF Seminar 389

Pest, disease and weed management in strawberry – progress and challenges for the Nordic production

Arranged by NJF Section IV Plant
Protection, Working Group "Plant
Protection in Sustainable Strawberry
Production" and MTT Agrifood Research
Finland

Lepaa, Finland, 8-9 November 2006

Introduction and maintenance of predatory mites as a preventive biocontrol buffer against strawberry tarsonemid mite in greenhouses

Tuomo Tuovinen and Isa Lindqvist

MTT Agrifood Research Finland, Plant Production Research, FI-31600 Jokioinen, Finland

e-mail: tuomo.tuovinen@mtt.fi

In certified strawberry plant production a zero tolerance for the strawberry tarsonemid mite *Phytonemus pallidus* is required. Organic plant production needs strict hygienic control to prevent infestation of mother plants as well as ready saleable plants. As the strawberry mite can be spread among others by insects and other animals plants are always threatened by infestation during the season whether grown in greenhouses, tunnels or outdoor fields. We investigated preventive control of the strawberry mite by introduction and maintenance of four species of predatory phytoseiid mites.

Strawberry plants (cv. Bounty), five plants per plot isolated with glue barriers, were planted in an experimental greenhouse block in March 2003. Two native phytoseiid mite species, *Anthoseius rhenanus* and *Euseius finlandicus*, commercially available *Amblyseius cucumeris*, and a native strain of *Amblyseius barkeri*, four females and one male per plant, were introduced into non-infested plants. To maintain the predatory mites on the plants small amounts of cattail (*Typha latifolia*) pollen was spread on the leaves 2-3 times per week. After seven weeks, two females and one male strawberry tarsonemid mite were placed on each plant. At the same time spreading of pollen was stopped. Two months later a second release of predatory mites took place. Samples of leaves, runners and whole plants (replaced with new, clean plants of the same age), were taken and inspected in 2-4 weeks intervals, from April to October.

In the first four weeks period the numbers of motile *E. finlandicus*, *A. rhenanus* and *A. cucumeris* grew whereas numbers of *N. barkeri* diminished. This was expected as the first two species are fed by pollen in the laboratory. After the introduction of strawberry tarsonemid mites spreading of pollen was finished. *A. rhenanus* numbers were highest whereas *E. finlandicus* collapsed. *A. barkeri* was found also in plots where no predators were introduced. At the end of the experiment *A. barkeri* dominated in all treatments except *A. cucumeris*, whereas *A. rhenanus* and *E. finlandicus* were not found at all.

Strawberry tarsonemid mite density grew fast in plants without predatory mites until the end of the season, whereas in *A. rhenanus* plots tarsonemid numbers remained low all the time. In *E. finlandicus* and *A. barkeri* plots tarsonemid mite numbers were quite high in summer but decreased later due to *A. barkeri*, which actively moved to plants with high strawberry mite numbers. In *A. cucumeris* plots tarsonemid numbers were low until the last inspection in October.

E. finlandicus, *A. rhenanus* and *A. cucumeris*, were able to increase in plants when fed by pollen. *A. cucumeris*, *A. barkeri* and *A. rhenanus* were most promising to keep strawberry mite under control, whereas *E. finlandicus* did not have any effect. *A. barkeri* spread to infested plants in spite of glue barriers between the plots.