IPM strategy for flower thrips control in open field strawberry production

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Background

Production of (small) fruit in Europe is performed under a large variety of climatic and growing conditions. Increase of sustainability (economic sustainability, competitiveness, environmental sustainability) by developing environmentally friendly farming systems is necessary.

Objective

Use of chemicals against flower thrips in strawberry production will be restricted further and most of the insecticides are since 2013 forbidden for application during blossoming in many European countries. By development of a robust system for biological control, input of chemicals can be reduced to a low level and will improve the healthy image of fruit consumption and reduce side effects.

Introduction

An IPM strategy for control of flower thrips was assessed in a straw-berry field trial with cv. Elsanta during last summers (2011-2013). Results of field experiments carried out in 2012 and 2013 at experimental farm Vredepeel-NL are presented.

Methods

Both in 2012 and in 2013 three plantings with varying transplanting dates between April 10 to July 6 were conducted in which the effect of the predatory mite Amblyseius montdorensis and the predatory bug Orius majusculus on thrips were measured. Also the effect of mulching by white plastic film was studied (Fig. 1).

Figure 1. Field experiment including different IPM strategies (e.g. white plastic mulch) during three plantings for thrips control in strawberry. Vredepeel-NL, August 2013.

Results

Temperature

- During all three plantings the hourly average night temperatures at -5 cm in the soil below plastic mulch were approximately between 0.3 and 0.5 °C lower than under straw (between 1h and 6-7h am).
- The minimum and maximum temperatures were 6.1 and 8.0 ° C, and 32.4 and 30.4 °C respectively under plastic mulch and straw measured 5 cm below the soil surface.

Thrips observations

- Flower thrips pressure in 2013 was significant higher than in 2012.
- In June 2013 about 85% of the flower thrips consisted of rose trips: *Thrips major/Thrips fuscipennis.*
- The total number of thrips larvae in the treatments: mulch, predatory bug or combination were between 49 and 73% lower in comparison with the untreated object.

Thrips injury

- The release of the predatory mite *A. montdorensis* has no apparent impact on the number of thrips larvae in the flowers and subsequently on fruit damage.
- In early plantings thrips attack in the white fruit stage was the lowest in the deltamethrin and plastic mulching objects.
- In later plantings with releasing *O. majusculus*, thrips attack was controlled at the same high level.

Conclusions

- From mid-July, fully biological control could be realized at presence of natural enemies: mainly by *Orius spp*.
- Release of predatory mites (A. montdorensis) had a limited impact but could possibly improve.
- Mulching with white plastic film reduces significantly the number of thrips larvae and subsequently damage of the fruits.
- Improvement of systems for 'lure & retain' *Orius sp*. are required.
- The possible role of entomopathogenic fungi (*Beauveria*, *Metarhizium*, etc.) in thrips control can be evaluated further.
- By further adjustment of the strawberry production system and a multitude of measures a robust and sustainable system of thrips control can be designed in the near future.

References

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