



# Grower Summary

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## **TF 218**

Increasing hoverfly populations  
in apple orchards for control of  
apple aphids

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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Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

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:** Increasing hoverfly populations in apple orchards for control of apple aphids

**Project number:** TF 218

**Project leader:** Chantelle Jay  
East Malling Research  
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ME19 6BJ  
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**Report:** Year 2 report 2016

**Previous report:** Year 1 report

**Key staff:** Chantelle Jay

**Location of project:** NIAB EMR

**Industry Representative:** John Evans; haresfarm@btconnect.com

**Date project commenced:** 1 April 2014

**Date project completed** 31 March 2017

**(or expected completion date):**

## **GROWER SUMMARY**

### **Headline**

- The plant volatiles methyl salicylate, phenyl ethanol and (E)- $\beta$ -farnesene in combination increased the number of hoverflies caught in baited traps indicating adult attraction.

### **Background and expected deliverables**

Apple aphids are ongoing pest problems and biological control can help to reduce the severity of attack or eliminate the pest altogether. Hoverfly larvae are voracious predators of aphids and if adults can be attracted into the orchard early in the season, and/or encouraged to overwinter in or close to orchards (hoverflies overwinter either as adults or pupae depending on the species), this increase in predators would be an important component of an IPM strategy. Biocontrol is particularly effective where ants are discouraged from protecting the aphids. Hoverfly adults respond to plant produced volatiles and to components specific to aphid feeding.

This project aims to determine whether volatiles can be used to attract hoverflies into orchards and whether they then act as effective predators of aphids, reducing aphid populations in the orchard.

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

Experiments have been done at East Malling Research to determine a blend of chemicals that will attract hoverflies and to examine the use of colour cues to assess if these will increase the attraction to hoverflies

The results, which are set out fully in the Science Section of this report, clearly show that hoverflies can be attracted to specific volatiles, and in these experiments a combination of the volatiles phenyl ethanol, methyl salicylate plus (E)- $\beta$ - farnesene had the greatest catches when blends were compared. Given that (E)- $\beta$ - farnesene is expensive to purchase, it may not be a cost effective addition to a dispenser. However, a combined blend of farnesene isomers may still give an increased catch and is worth exploring given that the cost of production is far cheaper. A combined phenyl ethanol and methyl salicylate dispenser may have a use in attracting other orchard beneficials such as lacewings, the combined blend being more effective than the single compounds alone.

Work in 2016 will concentrate on the blend required for hoverfly attraction and the economics of scale. With the withdrawal of commercially available aphicides this year such as chlorpyrifos, alternative control options will be essential to develop an effective IPM system.

### **Financial benefits**

Apple trees are subject to a number of aphid pests including the rosy apple aphid (*Dysaphis plantaginea* (Passerini)), the rosy leaf curling aphid (*Dysaphis devectora* (Walker)) and the green apple aphid, (*Aphis pomi* (De Geer)). When conditions are favourable pest numbers can increase rapidly. The rosy apple aphid is the most damaging of these and high numbers result in curled leaves and misshapen fruits, which can lead to economic losses. The Assured Produce threshold for RAA suggests that crop protection product application is justified if one aphid is found in the orchard pre-blossom. Some organic orchards see 100% crop loss from rosy apple aphid.

- Integrated pest management (IPM) strategies reduce crop protection product inputs, residues on the fruit and the risk of development of pest resistance to products.
- The use of plant volatiles to attract beneficial species is compatible with IPM and organic control programmes in apple orchards.
- If successful we will be able to manipulate beneficial species numbers in orchards with the aim of ultimately reducing pest numbers.
- Attraction of hoverflies into orchards would also be economically favourable as the adults are important pollinators. They are reported to be the most important pollinator group after wild bees.

### **Action points for growers**

- At this stage there are no specific recommendations for growers.