



# Grower Summary

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## **SF 162**

Development of a Pheromone  
Trap for Monitoring  
Blackcurrant Sawfly

Annual 2017

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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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**Project title:** Development of a Pheromone Trap for Monitoring Blackcurrant Sawfly

**Project number:** SF 162

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**Report:** Year 2 Annual Report 2016

**Previous report:** Year 1 Report

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**Date project commenced:** April 2015

**Date project completed (or expected completion date):** March 2018

# GROWER SUMMARY

## Headline

- Progress is being made to establish control thresholds for blackcurrant sawfly using the recently developed pheromone monitoring trap.

## Background and expected deliverables

Blackcurrant sawfly is a common and frequently damaging pest of blackcurrant, present to varying degrees in most UK blackcurrant plantations. Larvae feed on foliage in May-June (1st generation) and July-August (2nd generation) making irregular holes in leaves and causing defoliation which weakens the bushes and causes substantial losses in yield. Larvae may also contaminate harvested fruit so good control prior to harvest is important.

Infestation is sporadic and localised and damage can occur rapidly. Frequent crop inspection is needed for first signs of eggs, larvae and damage. Current grower practice relies upon application of a control product as soon as eggs, larvae or damage is detected by crop scouting. No practical systematic sampling methods or attendant crop damage thresholds have been developed and it is believed that there is widespread use of prophylactic treatment. Adequate crop scouting is time-consuming and expensive, and a more sensitive and rapid monitoring method is needed. Pheromone traps could provide such a tool.

Non-UV reflective white sticky traps are used for monitoring various other Tenthredinid sawfly pests of fruit trees including apple sawfly (*Hoplocampa testudinea*). Female gooseberry sawfly (*Nematus ribesii*), has been shown to produce a sex pheromone that attracts conspecific males, but, until recently, nothing was known about the chemical ecology of blackcurrant sawfly.

Development of a pheromone trap for blackcurrant sawfly was one of the objectives of the Defra Horticulture LINK project 'Developing Biocontrol Methods and their Integration in Sustainable Pest and Disease Management in Blackcurrant Production' (HL01105) which ran from 2010-2015. In this project, it was shown that male blackcurrant sawfly were attracted to virgin females, confirming the existence of a sex pheromone. Four potential pheromone components were detected, identified and synthesised. Three of these were produced only by females. They had structures unrelated to those of compounds reported as pheromone components in other sawfly species, but they caused very strong electroantennogram (EAG) responses from blackcurrant sawfly males. The fourth compound was produced in large quantities by both females and males and did not elicit an EAG response.

Trapping tests were carried out with blends of these compounds on several growers' farms during 2013 and 2014. A blend of two of the three EAG-active compounds was shown to be highly attractive to male blackcurrant sawfly, and addition of the fourth component seemed to increase attractiveness even further. The trapping experiments also confirmed the sporadic nature of this pest in that few or no sawfly were caught on several of the farms.

Blackcurrant growers differ in their approach to sawfly control. Some spray prophylactically, and others apply no sprays for the pest. In trials in the Defra Horticulture LINK project it was noted that one of the latter growers had sawfly adults in the crop, detected using pheromone traps. Eggs and young larvae were found in the bushes, but no older larvae were observed and no significant damage occurred. This may be because growers using fewer broad spectrum control products have a higher diversity of natural enemies, particularly earwigs which are known to feed on a range of pest species in tree fruits (see AHDB Project TF 220 (*Further development of earwig-safe spray programmes for apple and pear orchards*)). However, this was not explored in the Defra Horticulture LINK project. In addition, *Drosophila suzukii* (SWD) could become an increasing pest of blackcurrant meaning that insecticide sprays used against this pest may disrupt natural enemy numbers in the crop near to harvest. These factors have obvious implications for spray programmes and targeting of sprays for sawfly control.

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

In 2015, pheromone trapping of blackcurrant sawfly was carried out in blackcurrant grower field trials. A replicated trial confirmed previous results that a three-component blend of two isopropyl esters, Z7-14iPr and Z7-16iPr, and the unsaturated hydrocarbon, Z9-23H, is attractive to male blackcurrant sawfly. New results found that reducing the pheromone loading from 1 mg Z7-14iPr to 0.1 mg reduced catches. In addition, more sawfly were caught in red delta traps than green, at least for the most attractive blend. In a further trial to optimise the relative amount of Z7-16iPr in the blend, few blackcurrant sawfly were caught and no conclusions could be drawn. The different blends and traps were also tested in three other growers' fields, but catches were low, and overall the results illustrated the sporadic and localised nature of this pest.

In 2016 we aimed to relate catches of blackcurrant sawfly with this optimised pheromone blend and trap, to infestations by blackcurrant sawfly. The influence of natural enemies on this relationship will be determined.

Thirty eight red delta traps with the optimised three component blend released from a polythene vial were hung from the bushes throughout a plantation in Kent. Natural enemies, sawfly adults, eggs, larvae and damage levels were assessed for 20 weeks from 13 May – 22

September. Low adult sawfly catches (18 in total) were found. There were only 15 sawfly eggs, 12 larvae and very low levels of foliar damage detected. Low damage was found after observations of eggs and early stage larvae were made, and this potentially suggested that predation could be occurring before significant damage could take place. The adult blackcurrant sawfly catch was not significantly affected by the row in which the trap was deployed. A survey of earwig abundance in blackcurrant plantations in five regions across the UK in 2016 (SF 168) showed earwig numbers varied significantly between plantations and farms.

Work in 2017 aims to replicate the trial at a site with higher sawfly numbers in the East Midlands, allowing for a comparison to be drawn between the site used in 2016, to establish thresholds and optimal trap placement within a plantation.

## **Financial benefits**

Blackcurrant sawfly is a common and frequently damaging pest of blackcurrant, present to varying degrees in all UK blackcurrant plantations. Larvae feed on foliage causing defoliation which weakens the bushes and causes substantial losses in yield. Larvae may also contaminate harvested fruit so good control prior to harvest is important.

Chlorpyrifos is no longer approved and the future of thiacloprid is uncertain.

Adequate crop scouting is time-consuming and expensive, and a more sensitive and rapid monitoring method is needed. More effective monitoring would help to make more cost-effective use of control products currently available with a likely reduction in their use. Monitoring will be vital for effective use of any more benign, biological approaches developed in the future.

Pheromone traps could provide such a tool. Growers are generally familiar with this technology providing it is made readily available through commercial suppliers with adequate supporting information and protocols.

## **Action points for growers**

- Look for adults flying in April and May and target with approved control products to prevent egg laying.
- Check for eggs on the underside of leaves in the centre of the bush.
- Check for larval damage low down in the centre of the bush.
- Monitor predator populations (earwigs) in plantations by tap sampling, preferably after dark, using a white tray and beating stick,
- Monitoring traps are commercially available through Agralan.