Grower Summary

SF 162

Development of a Pheromone Trap for Monitoring Blackcurrant Sawfly

Annual 2016

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Further information

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Project title:	Development of a Pheromone Trap for Monitoring Blackcurrant Sawfly
Project number:	SF 162
Project leader:	Dr Michelle Fountain, NIAB EMR
Report:	Year 1 Annual Report 2016
Previous report:	None
Key staff:	Maddie Cannon (NIAB EMR) Prof David Hall, Dudley Farman (NRI)
Location of project:	NIAB EMR, NRI
Industry Representative:	Scott Raffle
Date project commenced:	April 2015
Date project completed (or expected completion date):	March 2017

GROWER SUMMARY

Headline

- A test trap and lure has been developed for the blackcurrant sawfly and this is being refined with a view to making it available to growers for commercial use.

Background and expected deliverables

Blackcurrant sawfly is a common and frequently damaging pest of blackcurrant, present to varying degrees in all 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 is to apply a crop protection 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 unnecessary 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*), were 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) 2010-2015. In this project, it was shown that male blackcurrant sawflies 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 antennal (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 used in the project.

Blackcurrant growers differ in their approach to sawfly control. Some spray prophylactically, often with chlorpyrifos or thiacloprid, and others apply no sprays for the pest. In trials in the Defra Horticulture LINK project, it was noted that one of the 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 found and no significant damage occurred. This may be because growers using fewer broad spectrum crop protection products have a higher diversity of predators, particularly earwigs, which are known to feed on a range of pest species in tree fruit crops (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) is likely to become an increasing pest of blackcurrant meaning that crop protection products used against this pest may disrupt predator numbers in blackcurrant crops at and near harvest. These factors have obvious implications for spray programmes and targeting of control product applications for sawfly control.

The aim of this project was to develop a pheromone-baited trap for blackcurrant sawfly that can be used by growers to monitor populations so they can improve the timeliness and effectiveness of control measures and minimise insecticide residues in the crop.

Summary of the project and main conclusions

Field trials of pheromone trapping of blackcurrant sawfly were carried out in growers' blackcurrant fields. A replicated trial confirmed previous results that a three-component blend of two isopropyl esters, Z7-14iPr and Z7-iPr, 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 and 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. Future work will focus on trap placement and the influence of natural enemies on this relationship will be determined.

Financial benefits

Pheromone traps could provide an accurate tool for blackcurrant growers to monitor for the presence of blackcurrant sawfly. Successful use of such monitoring devices would allow growers to use crop protection products at the optimum time, thus ensuring they gained complete and effective control in one application, thereby obviating the need to use subsequent applications. This would make financial savings by reducing both the labour cost of applying the products and the cost of the control products themselves.

Action points for growers

- Look for adults flying in April and May and target with approved insecticides 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 the numbers of predators in the crop including earwigs and ladybirds etc and foster and encourage populations;
- Contact michelle.fountain@emr.ac.uk NIAB EMR, New Road, East Malling, Kent ME19 6BJ if you would like to trial the test trap and lure.