Grower Summary

SF 126

Blueberry gall midge: sex pheromone monitoring and control with insecticides

Annual 2012

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Use of pesticides

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 HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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Project Number:	SF 126
Project Title:	Blueberry gall midge: sex pheromone monitoring and control with insecticides
Project Leader:	Professor Jerry Cross
Contractor:	East Malling Research
Industry Representative:	Laurie Adams
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Previous report/(s):	None
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Project Cost:	£60,871

Headline

- Work has begun to find an effective insecticide treatment for the blueberry gall midge, *Dasineura oxycoccana,* and to develop pheromone traps for more effective timing of control measures.

Background and expected deliverables

The blueberry gall midge (*Dasineura oxycoccana* -Johnson 1899, syn *Dasineura vaccinii* Smith, 1890) is a damaging invasive pest of highbush blueberry (*Vaccinium corymbosum*) in the UK. It is also a serious pest of blueberry in the USA and Canada where it originated and where it is known as the cranberry tipworm. It is abundant and widely distributed in UK blueberry crops, having spread from nurseries on planting material and is most important in newly planted crops and during the first 2-3 years of establishment.

The midge lays its eggs in the tender growing points of shoots and the larvae live in leaf galls in the shoot tip causing leaf distortion and blackening of buds which are killed by the attack. The growth habit of the blueberry occurs in flushes which end with the death of the terminal meristem and the next growth flush starts from the next bud or buds below. Midge attack caused termination more rapidly than it would otherwise occur. Serious attacks can affect the next season's crops because infested bushes develop few bud-bearing shoots. The pest is particularly troublesome on crops grown under protection.

Currently, UK growers attempt to control the midge by applying a spray of thiacloprid (Calypso) when galling damage is first seen in spring. Commercial experience also indicates that a weekly programme of sprays of pyrethrum prevents midge attack. However, on other crops including blackcurrant, blackberry, apple and pear, thiacloprid (Calypso) has been shown to be at best only partially effective for leaf midge control, and it is likely this is the case with the blueberry midge. Thus effective methods for monitoring the pest and controlling it with insecticides are needed.

EMR and NRI have successfully identified the female sex pheromones of other economically significant midge pests of UK fruit crops including apple leaf midge, pear leaf midge, pear midge, raspberry cane midge, blackcurrant leaf midge and blackberry leaf midge. Monitoring traps for several of these are currently in commercial use.

Other work by EMR has shown that an EC formulation of spirotetramat (Movento) is very effective for control of leaf midge pests and it is likely to be effective against blueberry gall

midge, although not currently approved for use in blueberry. Best control of leaf gall midges on other crops is achieved with a spray of insecticide timed to coincide with the onset of the midge's first flight in spring, as indicated by catches in sex pheromone traps. The traps are highly sensitive and give good quality information and an early warning of the magnitude and timing of attacks. The aim of this project is to identify the female sex pheromone of the blueberry gall midge and establish an effective insecticide to provide the basis for development of a similar strategy against this pest.

Summary of the project and main conclusions

Samples of pheromone were collected from over 1,000 virgin female blueberry gall midge. Analyses by gas chromatography (GC) coupled to electroantennogram (EAG) recording from the antenna of a male midge gave strong indications that collections contained very small amounts of a compound related to the pheromone components of other *Dasineura* species. However, this was not detectable by GC coupled to mass spectrometry (MS) and could not be identified further. Future work will focus on increasing the amount collected.

Pyrethrins (Pyrethrum), lambda-cyhalothrin (Hallmark), cypermethrin (Toppel) and chlorpyrifos products all gave partial control of shoot galling by blueberry gall midge when applied in late August. The limited efficacy of these insecticides was probably due to the fact that they could not be properly timed in relation to the gall midge attacks, which occur more or less continuously as a result of overlapping generations later in the season. Much better control might be expected if insecticide applications, timed by use of a sex pheromone trap, were applied against the first or second generations in spring, which are likely to be more synchronised.

Thiacloprid (Calypso) did not reduce galling significantly, but a coded experimental product HDCI 034, a translaminar, selective insecticide which is known to control the larvae of other gall midge pests inside galls, shows promise.

Further trials will be carried out in 2012.

Financial benefits

No detailed financial information on the cost to growers of the blueberry midge has been made in the UK. In Latvia, the midge has been shown to reduce growth and yields of large fruited cranberry by 60% (Apenite, 2010). In the USA, the blueberry gall midge causes losses in excess of $20 m per annum to rabbiteye blueberries (*Vaccinium ashei*) where the

pest feeds in the flowers leading to premature floral bud abscission, or aesthetically compromised fruit when mature (Dernisky et al., 2005).

Action points for growers

- No action points have arisen from this work so far.