



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

SF 126

Blueberry gall midge: sex
pheromone monitoring and control
with insecticides

Final 2014

Disclaimer

AHDB, operating through its HDC division seeks to ensure that the information contained within this document is accurate at the time of printing. No warranty is given in respect thereof and, to the maximum extent permitted by law the Agriculture and Horticulture Development Board accepts no liability for loss, damage or injury howsoever caused (including that caused by negligence) or suffered directly or indirectly in relation to information and opinions contained in or omitted from this document.

No part of this publication may be reproduced in any material form (including by photocopy or storage in any medium by electronic means) or any copy or adaptation stored, published or distributed (by physical, electronic or other means) without the prior permission in writing of the Agriculture and Horticulture Development Board, other than by reproduction in an unmodified form for the sole purpose of use as an information resource when the Agriculture and Horticulture Development Board or HDC is clearly acknowledged as the source, or in accordance with the provisions of the Copyright, Designs and Patents Act 1988. All rights reserved.

AHDB (logo) is a registered trademark of the Agriculture and Horticulture Development Board. HDC is a registered trademark of the Agriculture and Horticulture Development Board, for use by its HDC division. All other trademarks, logos and brand names contained in this publication are the trademarks of their respective holders. No rights are granted without the prior written permission of the relevant owners.

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.

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.

HDC is a division of the Agriculture and Horticulture Development Board.

Project Number:	SF126
Project Title:	Blueberry gall midge: sex pheromone monitoring and control with insecticides
Project Leader:	Prof. Jerry V Cross, EMR
Contractor/(s):	Professor Jerry Cross
Industry Representative:	Laurie Adams
Report:	Final report, May 2014
Publication Date:	14 May 2014
Previous report/(s):	Annual
Start Date:	1 April 2011
End Date:	31 March 2014
HDC Cost (Total cost)	£60, 871

Further information

If you would like a copy of this report, please email the HDC office (hdc@hdc.ahdb.org.uk), alternatively contact the HDC at the address below.

HDC,
AHDB
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel – 0247 669 2051

Headline

A sex pheromone trap has been developed for monitoring populations of blueberry gall midge in the UK.

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 or blueberry gall midge. Recent work in Canada has suggested that populations of this species on cranberry and on blueberry are different and may represent different, cryptic species. 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 causes 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 gall 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 in use commercially.

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

The sex pheromone of the blueberry gall midge found in the UK has been shown to correspond to that of the form infesting blueberry in Canada, which was identified by Canadian workers. Traps baited with this pheromone attracted large numbers of male midges in UK growers' plantations. The pheromone identified for the form infesting cranberry in Canada did not attract any midges in blueberry, cranberry or wild bilberry in the UK.

The pheromone has been synthesised and traps and lures will be commercially available in the UK during 2014. Traps should be deployed before any signs of damage are present as populations of the midge can build rapidly. Traps should be placed as near to the ground as possible for maximum catches. A trap threshold of 10 male midges per trap per week is advised as a suitable level at which to initiate control with plant protection products.

Two trials were conducted to investigate the efficacy of a range of insecticides for control of blueberry leaf midge. Thiacloprid (Calypso) and pyrethrins (Spruzit) are the only products currently approved for use against gall midge on blueberry. Of these only thiacloprid proved effective but accurate timing of application is essential. Chlorpyrifos and cypermethrin reduced numbers of larvae and resulting leaf galls. Lambda cyhalothrin also reduced some larvae and galling, but results were not consistent between spray dates and varieties.

The coded product UKA285a gave similar control to chlorpyrifos. Being systemic, this gave the greatest degree of control of both damage and larvae. It also offered the largest window of application.

Financial benefits

No detailed financial information on the cost to growers of the blueberry gall 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

- Pheromone traps for monitoring blueberry midge will be commercially available from early 2014.
- Crops should be monitored from early in the season before the pest is active.
- A trap catch of 10 male midges per trap is recommended as the threshold for application of approved products.
- Thiacloprid is currently approved for use on blueberry and is effective.