



Horticultural
Development
Company

Grower summary

SF 101

Alternatives to chlorpyrifos for
raspberry cane midge control

Annual Report 2009

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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.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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Headline

Neonicotinoid insecticides (including Calypso, Gazelle and Centric) show promise for curative control of raspberry cane midge larvae.

Background and deliverables

Raspberry cane midge is a major pest of raspberries in the UK. Growers currently rely on chlorpyrifos sprays for control. If use or registration of chlorpyrifos on raspberry was lost there would be no effective control for cane midge. The pest would increase and severely limit the productivity of raspberry plantations. The sex pheromone of the raspberry cane midge has been identified by EMR and NRI and pheromone traps are now available commercially for monitoring the pest to time spray applications. Work is in progress in HortLINK project HL0175 (SF74) to develop methods of using the pheromone for control of the pest by attract and kill methods, mass trapping or mating disruption, but mixed results have been obtained to date and it remains uncertain as to whether an effective pheromone based control method can be developed.

From 2003-05 in project SF 59, EMR conducted three trials to evaluate a wide range of alternative insecticides to chlorpyrifos for control of cane midge. None of the alternative products tested were found to be either suitable or sufficiently effective for commercial purposes. Treatment with Talstar + LI700 (adjuvant) reduced larval populations by 93% in one trial but synthetic pyrethroids have persistent harmful effects on natural enemies and their use is incompatible with IPM.

Importantly, recent work in Poland has indicated that the neonicotinoid insecticides acetamiprid (Gazelle) and thiamethoxam (Centric) have significant activity against cane midge. The neonicotinoid, thiacloprid (Calypso), is already approved for use on raspberry, and whilst it did not show promise in project SF59, further investigation is warranted. This finding needs to be verified and the most effective product and timing of spray application identified. Use of silicone based adjuvants (e.g. Break Thru 240 S) which may aid penetration of insecticides into splits also needs to be investigated.

The expected deliverables from this project were:

Identify an effective neonicotinoid insecticide for control of raspberry cane midge.

Ascertain the optimum timing of spray application in relation to pheromone trap catches. Determine whether the addition of a silicone based adjuvant significantly improves the performance of insecticides against cane midge.

Approval may be needed for some of the products identified.

Summary of the project and main conclusions

Two small scale replicated, randomised plot design trials were conducted to assess the efficacy of Calypso, Gazelle and Centric (applied with and without a wetter) in comparison to chlorpyrifos, against raspberry cane midge larvae. An untreated control was included. The first trial examined the curative effect of the sprays, i.e. when larval infestation was already present. In this trial the sprays were applied to canes with artificial splits that had been made 7 days earlier and which already contained eggs and larvae. The second trial tested the efficacy of preventing larval infestations in cane splits that were made 7 days after application. Sprays were timed using the sex pheromone lures in white delta traps. Applications were made in a volume of 1000 l/ha using an air assisted knapsack sprayer.

The main conclusions of this project were:

A spray of Calypso, Gazelle or Centric was effective at controlling raspberry cane midge larvae when applied curatively to larvae in cane splits but were ineffective when applied as preventive treatments 7 days before midge attack.

Treatments at half the recommended rate with the addition of Silwett L-77, were equally as effective as the full dose pesticide alone against developing infestations of cane midge.

Applications timed to occur within 7 days of the peak flight of male cane midge resulted in good levels of control.

Applications of neonicotinoids as preventive treatments were not effective at stopping eggs and larvae developing in raspberry cane splits.

Further work to validate these findings and to explore a wider range of intervals between treatment and midge attack is needed before reliance on these treatments for control of cane midge on raspberry can be recommended. Calypso is approved for use on protected and

outdoor raspberry. Gazelle is approved for use on protected raspberry, but only on non-fruiting crops. Centric is not approved for use on raspberry.

Financial benefits

Chlorpyrifos is relied on for control of cane midge in the UK but approval for use on the crop is under threat. If alternatives to control these pests cannot be found, should approval for chlorpyrifos be lost, raspberry production would become uneconomic in the UK. Finding alternative treatments is crucial to the raspberry industry. At current prices, treatment of 1 ha of raspberry at the recommended dose with Lorsban, Calypso or Tracer costs £14, £39 and £50 respectively.

Action points for growers

Calypso, Gazelle and Centric show promise for curative control of raspberry cane midge larvae.

A silicone wetter improves efficacy. The addition of Silwet-L77 reduces the amount of insecticide used by 50% but maintains the efficacy, thus reducing costs and risks of residues in the fruit.

Further work to validate these findings and to explore a wider range of intervals between treatment and midge attack is needed before reliance on these treatments for control of cane midge on raspberry can be recommended.

Calypso is approved for use on protected and non-protected raspberry. Gazelle is approved for use on protected raspberry, but only on non-fruiting crops. Centric is not approved for use on raspberry.

The use of raspberry cane midge monitoring traps give better timing of spray applications than the ADAS prediction model, increasing the efficacy of the insecticides applied.