

Grower Summary

SF 140

Control of potato aphid
(*Macrosiphum euphorbiae*), in
spring, on strawberry

Annual 2015

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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.

Further information

If you would like a copy of this 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 Number: SF 140

Project Title: Control of potato aphid (*Macrosiphum euphorbiae*), in spring, on strawberry

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Previous report(s): None

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End Date: 31 March 2016

Project Cost: £33,841

GROWER SUMMARY

Headline

- Potato aphid populations begin to recover within two weeks of some insecticide applications to strawberry.

Background and expected deliverables

A range of aphids are pests of strawberry, including the strawberry aphid (*Chaetosiphon fragaefolii*), the shallot aphid (*Myzus ascalonicus*), the melon and cotton aphid (*Aphis gossypii*), the glasshouse and potato aphid (*Aulacorthum solani*) and the potato aphid (*Macrosiphum euphorbiae*). They cause direct damage to the plant including distortion, and strawberry aphid and some other species may transmit viruses. The potato aphid has become a more common pest of strawberry in recent years. It produces copious amounts of honeydew which contaminates the fruit. Many of the insecticides applied to strawberry through the season are targeted to control potato aphid.

AHDB Horticulture project SF 094 - Minimising pesticide residues in strawberry through integrated pest, disease and environmental crop management (HortLINK) - demonstrated that autumn sprays of thiacloprid reduced spring infestations of aphids on strawberry. However, autumn applications need to be well timed and their efficacy are subject to the weather and ground conditions in October. Hence, some plantations may not receive sprays, leading to problems with aphids early the following spring. There is a need to identify which products would be more effective in spring. There are reports by agronomists that some populations of *Macrosiphum euphorbiae* may be less susceptible than others to certain insecticides, but this currently appears to have no impact on the levels of control that can be achieved with the use of approved insecticides in brassicas and potato (IRAG 2008; 2012).

Another possible cause for failure in control may be that temperatures are not high enough in the spring for uptake of plant protection products into the plant.

Summary of the project and main conclusions

The aim of the project is to improve the control of potato aphid (*M. euphorbiae*) in the spring on strawberry. In the first year (2013) we screened nine insecticides; acetamiprid (Gazelle),

a coded product, chlorpyrifos (Equity), flonicamid (Teppeki), lambda-cyhalothrin (Hallmark), pirimicarb (Aphox), pymetrozine (Chess), pyrethrins (Pyrethrum) and thiacloprid (Calypso) in a randomised block experiment on potted strawberry plants. These were compared to an untreated control. The trial was done in typical spring temperatures (average 10.4°C). Numbers of aphids on the untreated control plots continued to increase over the trial period. All the tested insecticides (both those approved and non-approved on strawberry) reduced numbers of aphids on the strawberry plants by at least 80%. By the end of the trial (10 May) no aphids were found on plants that had been treated with Gazelle, the coded product, Hallmark, Aphox or Pyrethrum.

Because all of the tested products in the 2013 trial were successful at controlling *M. euphorbiae* the aim of the study in 2014 was to test the survival of *M. euphorbiae* in commercial strawberry plantations.

Two *M. euphorbiae* infested commercial strawberry plantations in Kent were used for the replicated trials and included an untreated control. The treatments were; chlorpyrifos (Equity) at 1.50 l/ha, lambda-cyhalothrin (Hallmark with zeon technology) at 0.150 l/ha, pirimicarb (Aphox) at 0.560 kg/ha, pymetrozine (Chess) at 0.400 kg/ha, pyrethrins (Pyrethrum) at 2.4 l/ha and thiacloprid (Calypso) at 0.250 l/ha. An air assisted knapsack sprayer was used to apply the sprays at 1,000 l/ha. Water sensitive papers were stapled on the outer, middle and inner leaves before spraying for evidence of spray coverage. A pre-assessment of the numbers of aphids on leaves was made. Counts of aphids were made one and two weeks after the insecticide applications. Samples of aphids from one site were sent for resistance testing to Rothamsted Research.

Adequate spray coverage of the insecticide treated strawberry plants was achieved. Numbers of *M. euphorbiae* on the untreated control plots declined at both sites over the trial period. All of the tested insecticides reduced the numbers of *M. euphorbiae* for at least one week. *M. euphorbiae* numbers increased by the second assessment (two weeks later) on plants treated with chlorpyrifos and pymetrozine in both spray trials. Only lambda-cyhalothrin gave consistent, long-term, (over two weeks) control of *M. euphorbiae*. At one site there was no overall significant difference between the numbers of *M. euphorbiae* on the untreated plants and the plants treated with pymetrozine after a single application. It is possible that some individual *M. euphorbiae* were able to tolerate sprays of pymetrozine but no evidence for resistance has been found to date.

Financial benefits

Potentially, if not controlled, aphid infestations can lead to complete crop loss. No quantitative data on industry average losses resulting from aphid infestation is available but conservatively, assuming that 1% of the crop is lost, this is equivalent to 507 tonnes of strawberries, worth £2.1 million p.a. Improved control as a result of this work would reduce the scale of these losses considerably. The results of this study may also be transferable to other affected crops such as raspberry, loganberry and hops.

Action points for growers

- Growers should ensure good spray coverage of the underside of strawberry leaves. Water sensitive papers attached during spraying will give a reasonable indication if this is being achieved.
- Insecticide resistance management must be incorporated into spray programmes by following the recommendations on the product label and rotating modes of actions of pesticides.
- Many aphicides are more effective at warmer temperatures, when they have a better fumigant action (chlorpyrifos, pirimicarb) and/or are more rapidly taken up into the plant than ingested by aphids.
- Growers should monitor the effects of insecticide sprays to ensure control is being achieved.