

Grower summary

FV 238

Dissemination and
exploitation of aphid
monitoring data

Annual report 2003

Project Title: Dissemination and exploitation of aphid monitoring data

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Macrosiphum euphorbiae (potato aphid), *Brevicoryne brassicae* (cabbage aphid), *Cavariella aegopodii* (willow-carrot aphid), *Nasonovia ribisnigri* (currant-lettuce aphid), monitoring, forecasting, suction trap, insecticide resistance

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Headline

- Read our up to date information each week on numbers of aphids flying.
- Tell us what you see in your crops to help us improve interpretation of our data to meet your needs better.

Background and expected deliverables

Aphids can cause problems in every horticultural crop. Financial losses may be due to cosmetic damage or to yield loss resulting from removal of phloem sap or from viruses transmitted by the aphids. Some key aphid species of horticultural significance have clones which are resistant to a range of insecticides. Use of insecticides hastens the development of resistance and there is thus the need to reduce use to the minimum necessary. Such a strategy has many components, one of which is monitoring and forecasting which can help to optimise spray timings. Crop monitoring is time consuming, and can be guided by regional monitoring which does not involve growers.

The Rothamsted Insect Survey co-ordinates a network of 16 suction traps in the UK for monitoring aphids. The long term and spatially extensive natures of the data facilitate forecasting of timing of migrations and abundance of a range of economically important species. Forecasts are driven mainly by temperature.

The objective of this project is to provide forecasts and up to date information on aphid species of importance in horticulture in a format that facilitates their use by growers. This should allow improved targeting of surveillance and control measures. As the suction traps provide regional data, the objective will be greatly enhanced by information from growers on aphid infestations in their crops (time of first sighting, size of infestations) which will allow us to build up a picture of the extent of local variation in populations and how it relates to the regional data.

Summary of the project and main conclusions

Aphid monitoring

During 2002, 32 aphid data bulletins were issued, listing 21 aphid species caught in suction traps at 16 sites throughout England and Scotland. Eighteen of these bulletins were accompanied by an aphid news sheet interpreting the figures relative to previous years. The raw data on aphids (including several that are pests of non horticultural crops) were also made available via the internet (www.rothamsted.bbsrc.ac.uk/insect-survey), and it will soon be possible for individuals to tailor bulletins to include only the regions and aphid species of interest to them. It will also be possible to include the news sheets with interpreted information on the internet pages if this is considered desirable. General information on the relevant aphid species is also now available on the internet pages.

Aphid forecasts

Forecasts were provided in early March for the timing and size of spring migrations in 2002 of peach-potato aphid, potato aphid and cabbage aphid. Forecasts for the willow-carrot aphid and currant-lettuce aphid are under development. A mild winter with relatively few hard frosts suggested an early migration throughout the country. This was realised for most aphid species and resulted in large numbers in the early part of the year. However, the large numbers early on did not develop into high mid season peaks, largely due to suppression by natural enemies, which had also overwintered well.

Summary of the 2002 growing season

The 'high fliers' this year were the **willow-carrot aphid, *Cavariella aegopodii***, and the **black bean aphid, *Aphis fabae***. The **willow-carrot aphid** arrived three to four weeks earlier than the ten year mean with large numbers in May and June, particularly in the midlands. This was a complete reversal of 2001 where a late season, followed by a wet May, resulted in an almost complete non-appearance. The **black bean aphid**

burst on the scene just as the other species were tailing off in early July. Reports from the field described large numbers everywhere, even on non-host crops. These numbers were reflected in the traps with high numbers at Starcross, Hereford and across Scotland.

The **peach–potato aphid**, *Myzus persicae*, also made an early appearance in most places, but large numbers did not develop anywhere. Resistance testing showed little problem in spring/summer, but 19 individuals tested positive for MACE resistance at Kirton during the autumn flights and there were some control problems in brassicas. There was no repeat or residual trace of the MACE problems experienced around Edinburgh and Dundee in 2001.

The **potato aphid**, *Macrosiphum euphorbiae*, the **cabbage aphid**, *Brevicoryne brassicae*, and the **currant–lettuce aphid**, *Nasonovia ribisnigri*, all appeared somewhat early, but subsequent populations were well below normal for the first two species, and about normal for the third.

The aphids pass the winter as follows:

Black bean aphid - only as eggs on spindle trees.

Cabbage aphid - mainly in the mobile stages on cruciferous crops and weeds, but not usually kale, rape or turnips. A few may survive as eggs on the same host plants.

Currant–lettuce aphid - only as eggs on blackcurrant.

Peach–potato aphid - mainly in the mobile stages on a wide range of weed species and, potentially, on potatoes in store and indoor lettuce. A few pass the winter as eggs on peach.

Potato aphid - mainly in the mobile stages on a wide range of weed species and, potentially, on potatoes in store and indoor lettuce. A few pass the winter as eggs on roses.

Willow–carrot aphid - as eggs on willow and in the active stages on various umbelliferous weeds.

Those passing the winter in the active stages do better the milder the winter. The eggs will survive anything a British winter can throw at them and mortality is mainly due to predation by birds.

Financial benefits

The project:

- provides forecasts of the timing and size of aphid migrations nation-wide;
- provides easy access for growers and advisers to relevant information on current aphid pest status, insecticide resistance status, biology and control options;
- helps to facilitate focussed crop inspections prior to making control decisions;
- helps to facilitate optimal insecticide usage and hence reduce costs, limit selection for insecticide resistance and produce environmental benefits.

Much information was available during the second year of the project, providing the potential for a rapid return on investment. It is anticipated that a very small reduction in insecticide usage would be equivalent to the cost of the project. The cost-benefit relationship is enhanced dramatically by the synergistic funding of a range of organisations and core funding through the BBSRC and Lawes Agricultural Trust (total approximately £280,000 per year). It is difficult to cost environmental benefits.

Action points for growers

The winter of 2002/2003 has been average in terms of temperature, and early aphid flights are not expected in 2003 unless the spring is exceptionally warm.

Look at our weekly bulletins which you should receive by email from the HDC together with an interpretation. You can access the data bulletin and background information about the aphids of horticultural importance via the web (www.rothamsted.bbsrc.ac.uk/insect-survey).

Please inform us (mark-s.taylor@bbsrc.ac.uk) of aphid occurrences in your crops so that information which may be of use to other growers can be included in our weekly news sheets, and we can compare your local findings to our regional assessments and hence gradually improve interpretation of our regional data.