

**Project number:** FV 254b

**Project title:** HDC Pest Bulletin

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**Report:** Final report, 2011 - *Grower Summary as Full Report*

**Previous reports:** None

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**Start date:** 1 April 2010

**Completion date:** 31 March 2011

**Key words:** Pest forecasts, cabbage root fly, carrot fly, cutworms, large narcissus fly, caterpillars, aphids, Rothamsted Insect Survey, suction traps

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## AUTHENTICATION

We declare that this work was done under our supervision according to the procedures described herein and that the report represents a true and accurate record of the results obtained.

Dr Rosemary Collier

Director, Warwick Crop Centre

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Signature ..... Date .....

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[Organisation's authority Name]

[Position]

[Organisation]

Signature ..... Date .....

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*NB: This constitutes the report in full - there is no additional "Science Section"*

## Headline

The HDC Pest Bulletin web pages received more than 30,000 'views' between April and October 2010. The most popular pages were, in decreasing order of popularity: the HDC Pest Bulletin home page, carrot fly, cabbage root fly, cutworm forecast.

## Background and expected deliverables

The HDC Pest Bulletin is hosted by the Warwick HRI website and the link to the site is provided in the HDC weekly e-mails.

**Please note: as of June 2011 the HDC Pest Bulletin has been moved to the Syngenta website: <http://www.syngenta-crop.co.uk/pestupdate/>.**

The Bulletin consists of a 'General Summary' page with links to crop-specific pages for Brassicas, lettuce, carrot/parsnip, Alliums and narcissus. The main sources of information for the website are:

- A summary of the captures of pest aphids made by the network of suction traps run by the Rothamsted Insect Survey, accompanied by commentary relevant to horticultural crops
- Output from the HRI/HDC forecasting models for carrot fly, cabbage root fly, pollen beetle and large narcissus fly.
- Output from the cutworm forecast (incorporated into the MORPH decision support software).

Additional information provided in the Bulletin includes:

- Information on the resistance status of peach-potato aphids captured in suction traps – provided by Rothamsted Research
- Information on caterpillar and flea beetle activity where available
- Day-degree forecast for lettuce root aphid
- Feedback from growers
- Information on pest activity in the monitoring plots at Warwick HRI. This is mainly on carrot fly and cabbage root fly and is presented in conjunction with the appropriate forecasts.

## Summary of the project and main conclusions

The HDC Pest Bulletin has completed its seventh season. The Bulletin was hosted by the Warwick HRI website and the link to the site was provided in the HDC weekly e-mails. The Bulletin consisted of a 'General Summary' page with links to crop-specific pages for Brassicas, lettuce, carrot/parsnip, alliums and narcissus. The bulletin provided forecasts for several pests of vegetable crops (and also large narcissus fly), summaries of aphid captures by the network of suction traps run by the Rothamsted Insect Survey and other information on pest numbers and activity as it became available. It also provided a certain amount of 'historical' data – which can provide useful background information.

The HDC Pest Bulletin web pages received more than 30,000 'views' between April and October 2010. The most popular pages were, in decreasing order of popularity: the HDC Pest Bulletin home page, carrot fly, cabbage root fly, cutworm forecast.

The HDC Pest Bulletin website resumed activity in early March 2010 when Rothamsted Research produced forecasts of the dates by which various aphid species would start to migrate into new crops, and also predicted the relative abundance of each species during the first part of the summer. These forecasts are based on weather conditions, particularly temperature, during the winter. To quote the text accompanying the initial forecasts *'Provisional data from the Met Office suggest the winter of 2009/10 was the coldest in England since 1978/79 and in Scotland since 1962/63. The prolonged period of cold weather with snow in many places was at least 2°C colder than the 1971-2000 average. This translates into a time of first flight that is likely to be over two weeks later than last year's predictions, and numbers that are will be lower than the average. The forecasts assume average spring temperatures, but with such late forecasts, we will be holding our breath for a considerable part of May and early June. The message is that, in spring and early summer, aphids are unlikely to be early or abundant. The down side is that natural enemies emerging from hibernation may go hungry and produce a rather low number of offspring. This could lead to higher aphid numbers later in the year but, in spring-planted crops, it is early aphids that cause most problems'*.

The bulletin also hosted a page entitled *'What effect will the cold winter of 2009-10 have on vegetable pests?'* to outline some of the possible effects on pest activity in the coming year.

Detailed aphid bulletins were produced by Rothamsted Research until the end of July. In general, numbers of cabbage aphid (*Brevicoryne brassica*) captured up to the end of July

were lower than in 2009 and also lower than the average for the previous 10 years. The same was broadly true for potato aphid (*Macrosiphum euphorbiae*) and peach-potato aphid (*Myzus persicae*). All these species overwinter as adult aphids and are thus very susceptible to severe winter conditions. In contrast, numbers of willow-carrot aphid (*Cavariella aegopodii*) were high, particularly in the south-east (Writtle, Broom's Barn, Kirton, Harpenden). This species overwinters in the egg stage on willow (the winter host) and is more resistant to cold and wet weather. Numbers of currant-lettuce aphid (*Nasonovai ribisnigri*) were very low, but this is not unusual since this species appears to be 'trap-shy' both in terms of suction traps and water traps. Rothamsted Research summed up the season by saying that '*Overall the predicted late and low aphid summer has been borne out with numbers only rising once well into July as suggested earlier in the year*'.

The pest bulletin updates started in earnest towards the end of April – with forecasts for cabbage root fly and carrot fly. These were run using a new source of weather data, the records being provided by Plantsystems from in-field weather stations at 9 locations in England and Scotland. UAP supplied data for a site in Northern Ireland, which was also used to produce forecasts, requested especially by some Northern Irish growers. These data were used to produce all of the forecasts posted on the pest bulletin web site that used either the MORPH software or simpler day-degree models (for lettuce aphids and willow-carrot aphid). There were a few technical problems with the weather data and this highlights the need to check the data from in-field weather stations on a regular basis.

The MORPH decision support software was also used to run the cutworm (turnip moth – *Agrotis segetum*) forecast. Accumulated day-degrees were used to estimate when moths would start to be active and lay eggs and this prediction was backed up by pheromone trap captures at Wellesbourne. The first moths were captured in late May. Obviously the cutworm forecasts are location-specific but, in general, weather patterns were such that although the forecast predicted that cutworm survival was good in early July, thereafter it was reduced in most locations due to fairly regular rainfall.

Our main fly pests are probably less affected by cold winter weather than aphids and both cabbage root fly (*Delia radicum*) and carrot fly (*Psila rosae*) infestations continued to develop as expected at Wellesbourne. The cabbage root fly regularly completes a third generation in the south and Midlands and 2010 was no exception. A third generation of adult carrot flies was predicted, and occurred, at warm sites in the south of the UK. An HDC-funded study several years ago indicated that the third generation was generally not a threat to carrot crops, because even if female flies laid eggs at this time there were insufficient 'heat units'

for these to develop into larvae that would cause damage. However, we need to keep a watchful eye on third generation carrot fly and the carrot fly forecast should help us to do this.

### **Financial benefits**

Information on the timing of pest activity and on pest abundance helps growers make significant improvements in the pest control decision making process.

### **Action points for growers**

- Access the 'HDC Pest Bulletin' regularly and feed back information to help make the Bulletin as useful and effective as possible.
- Feedback information by following the link to 'Rosemary Collier' on the site.