Grower Summary

CP 124

Managing ornamental plants sustainably (MOPS):

Efficacy of plant protection products against sucking insects – glasshouse whitefly / protected ornamental

Annual 2014

Disclaimer

While the Agriculture and Horticulture Development Board 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.

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.

AHDB Horticulture,
AHDB
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

Tel – 0247 669 2051

AHDB Horticulture is a Division of the Agriculture and Horticulture Development Board.

Project Number:	CP 124
Project Title:	Managing ornamental plants sustainably (MOPS)
Work package title:	Efficacy of plant protection products against sucking insects – glasshouse whitefly / protected ornamental
Work package leader:	Dr Dave Chandler, Warwick Crop Centre
Contractor:	University of Warwick
Report:	Annual report 2014
Publication Date:	28 July 2015
Previous report/(s):	None
Start Date:	20 May 2014
End Date:	19 September 2014
Project Cost:	£241,833

GROWER SUMMARY

Headline

Six products were identified that caused significant reductions in populations of glasshouse whitefly feeding on verbena plants. The products appear to have worked mainly by causing death of whitefly during the nymphal and / or pupal stages, resulting in a reduction in the numbers of adult whitefly emerging from pupae.

Background and expected deliverables

Glasshouse whitefly (*Trialeurodes vaporariorum)* is one of the most common pests of ornamentals. Infested plants become contaminated with sticky honeydew excreted by whiteflies and this allows the growth of sooty moulds. In severe infestations, leaf yellowing and plant stunting occurs. The
presence of whiteflies and damage symptoms can cause ornamental plants to be unmarketable. The glasshouse whitefly has developed resistance to pyrethroids such as deltamethrin (e.g. Decis) and pyrethrum (e.g. Spruzit) and there has been one recorded incidence of resistance to neonicotinoid insecticides such as imidacloprid (e.g. Intercept 70 WG) in the UK.

The purpose of Objective 2 was to test the efficacy of plant protection products against sucking insects. In particular, Objective 2.1 was to test the efficacy of new conventional chemical and biopesticide products against glasshouse whitefly *Trialeurodes vaporariorum* on a selected susceptible protected ornamental species.

Summary of the work and main conclusions

Seven plant protection products (Table 1) were tested against glasshouse whitefly (*Trialeurodes vaporariorum)* on Verbena plants maintained under glasshouse conditions between June and September 2014 at Warwick Crop Centre, Wellesbourne, UK. The glasshouse compartment was fitted with insect-proof screens in order to minimise the risk of plants becoming infested with other insect pests. Temperature within the compartment was regulated by venting the compartment at 15^{O}C and using additional heating if required to maintain a temperature between 15 and 25^{O}C.

Table 1. Products tested

MOPS code number	Biopesticide or conventional pesticide
Water control	-
Teppeki (flonicamid)	conventional
130	biopesticide
62	biopesticide
208	conventional
59	conventional
179	biopesticide
205	biopesticide

Plants were purchased as plugs and potted into Levington M2 Pot/Bedding Compost in 9cm diameter pots on 20th May. Twelve plants were arranged in four rows of three in each of 48 plots. Each plot was enclosed within a mesh cage (0.5m x 0.4m x 0.4m). Plants were watered from beneath using the capillary matting.

The population of whitefly used was established from a population of whitefly supplied by David Talbot (ADAS) from a commercial nursery. Each plot was infested with 50 adult whitefly on the 3rd July 2014 and then a further 30 adult whitefly introduced on the 17th July 2014.

An application rate for each plant protection product tested was agreed with the product manufacturers. All plant protection products were applied using an electric sprayer fitted with an HC/1.74/3 nozzle, in 600 litres of water per hectare using 3 bar pressure. A water control was applied using the same water volume and pressure. No adjuvants were used for any products tested. Each plant protection product and the water control was applied at weekly intervals for four weeks. The numbers of whitefly eggs, nymphs and adults on selected, marked leaves were recorded one day before the first spray application on the 1st August 2014 and then at three and six days after this application. Whitefly numbers were then recorded in exactly the same way six days after the second spray application (date of assessment = 8th August 2014), third (15th August 2014) and fourth (22nd August 2014) spray applications. A final assessment was made on the 19th September which was done by counting the numbers of adult whitefly caught on sticky traps placed in the cages. This was

done 28 days after the final spray application. In addition, assessments of phytotoxicity were completed after each spray application.

Products 62 and 179 caused significant reductions in numbers of whitefly nymphs and products 62, 205 and 179 caused significant reductions in numbers of whitefly eggs, but this did not happen on every sampling occasion. All of the treatments reduced the numbers of whitefly adults caught on sticky traps 28 days after the final spray application, with the standard (Teppeki) and the products 208 and 59 reducing whitefly numbers close to zero in each plot (Figure 1).

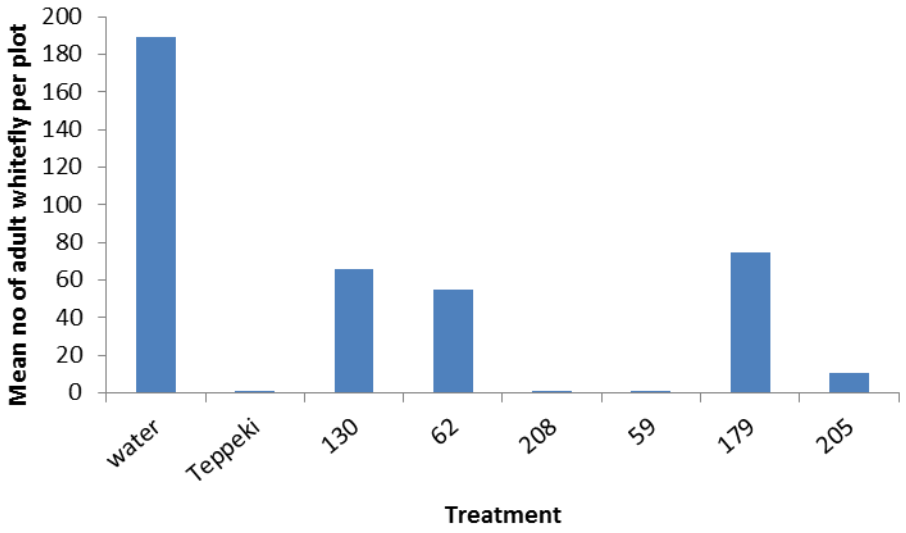

Figure 1. Mean numbers (backtransformed) of adult whitefly per plot collected on sticky traps 28 days after the final spray application.

There was no or limited phytotoxicity caused by any of the plant protection products tested. A very small number of leaves were observed with browning of the leaf edges and speckling of the flowers for some of the products tested.

Action Points

- A range of products have been identified which have potential as whitefly treatments. They all appear to have their main effect during the nymphal / pupal stages and preventing the emergence of adult whitefly from the pupae.
- Flonicamid (here applied as Teppeki, which is used for the control of aphids on wheat and potato) also effectively controlled glasshouse whitefly and therefore Mainman, an identical product which has an EAMU (0045 of 2013) for use on ornamentals, should also be effective.