

Grower Summary

PO 009

Review of the development and use of trap plant systems for pest control in protected ornamental crops

Final 2012

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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

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HDC is a division of the Agriculture and Horticulture Development Board.

Project Number: PO 009

Project Title: Review of the development and use of trap plant systems for pest control in protected ornamental crops

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Headline

This is a desk study which outlines the importance, mechanisms and literature base of trap plant approaches to control pests. The report is focused on protected crops, in particular ornamentals. The study provides an overview of trap plants whilst highlighting specific studies of relevance to the UK protected horticulture sector.

Background

The protected ornamental industry faces a range of issues linked to crop protection and production. These include a reduction in the available products approved for use, the potential for increasing resistance in target pest organisms, increasing pressures from consumers and retailers for 'environmentally-friendly' practices and a need to comply with legislation and industry initiatives. These pressures have led to a change in pesticide use and the exploitation of other methods available for maintaining pest populations below the economic damage thresholds, using integrated crop management (ICM).

Trap plants offer a means of manipulating pest behaviour and their use for pest control has been well researched in some arable and horticultural crops. However, the vast majority of successful examples to date are in outdoor crops. . In many cases, promising results have been obtained and recent evidence suggests that trap plant systems may be transferable to ornamental crop production where interest in the subject area is increasing.

Trap plants are usually grown either within a crop or around its perimeter. The pest preference for the trap plants over the crop plants, results in reduced pest damage to the main crop. Though most commonly employed against more mobile pests (such as beetles butterflies and moths), research suggests that trap plants can also be used with success against pests displaying more random and/or weak dispersal behaviours, such as thrips, whitefly and aphids, which are of particular interest to protected ornamental growers.

Recent research suggests that a trap plant approach may work in protected ornamental crops as it has in outdoor edible and arable crops. Work with both western flower thrips and glasshouse whitefly, for example, has produced promising trap plant species for use in several ornamental crops.

This desk study aims to bring together the evidence relating to the successful use of trap plants, providing UK growers with an improved evidence base to inform them of which trap plants are most attractive to pests (i.e. which have the potential to work best from the

scientific literature). This, combined with feedback from growers through a survey and consultation, will allow growers to assess where trap plant research would benefit from further work.

Summary

There are a number of important conclusions that can be drawn from this desk study on the use of trap plants:

- 1) There are many documented successes of trap plant approaches in outdoor crops, which prove that the mechanism of trap plant control works, on a fundamental level. Current research on the use of trap plants in ornamental crops however was limited to whitefly control in poinsettia and thrips control in chrysanthemums. A body of research supported the use of trap plant approaches for the control of these pests in protected crops. There is huge scope for further applied research into the use of trap plants against other pests and in other protected ornamental crops.
- 2) The literature points to the fact that most of the innovation in the field of trap plant pest control strategies is taking place in the USA. A number of the pests that have been studied in the USA also have a distribution in the UK (including capids, western flower thrips and whitefly). This American collection of studies could be put to further use in this country by applying the theory to commercial trials in the UK.
- 3) There is a large variation in the management and use of trap plants which indicates that trap plants can be a very flexible pest control strategy, forming part of a wider ICM regime which incorporates biological pest control, physical trapping, semiochemicals etc. It is particularly important to look ahead at work which investigates the best methods of deployment of trap plants. Two of the growers surveyed mentioned the management of the trap plants and how this relates to their decision to use them or not. There is a good deal of work to be done looking at the placement of trap plants in the main crop, the number required, the growth stage of the trap plant, and which methods of chemical, cultural, physical and biological pest control can be employed by growers to accompany trap plant strategies.

Financial Benefits

This desk study report is a review of the use of trap plants, their definitions, successes and failings, financial benefits have not been specifically pinpointed, however, the diversification of control methods in the current climate of reduced pesticide availability may have a wide-range of financial benefits for the protected crop industry. If the number of spray applications can be reduced on account of traps plant use within crops, or at least early sprays targeted more accurately because of their use then savings will accrue in terms of reduced pesticide costs and more importantly application time costs.

Action Points

- It is suggested that growers use this study as a foundation for decisions made about future work on trap plants specifically, and ICM approaches to pest control in general.
- To compliment yellow / blue sticky traps, trap plants such as aubergine and nicotinia could be used within 'mono-crop pot plant crops' such as pot chrysanthemums and poinsettias to monitor levels of whitefly and other flying pests.