

AMBER



Key priorities in horticulture

£8.8m levy invested in 2017/18

Four key areas of activity:

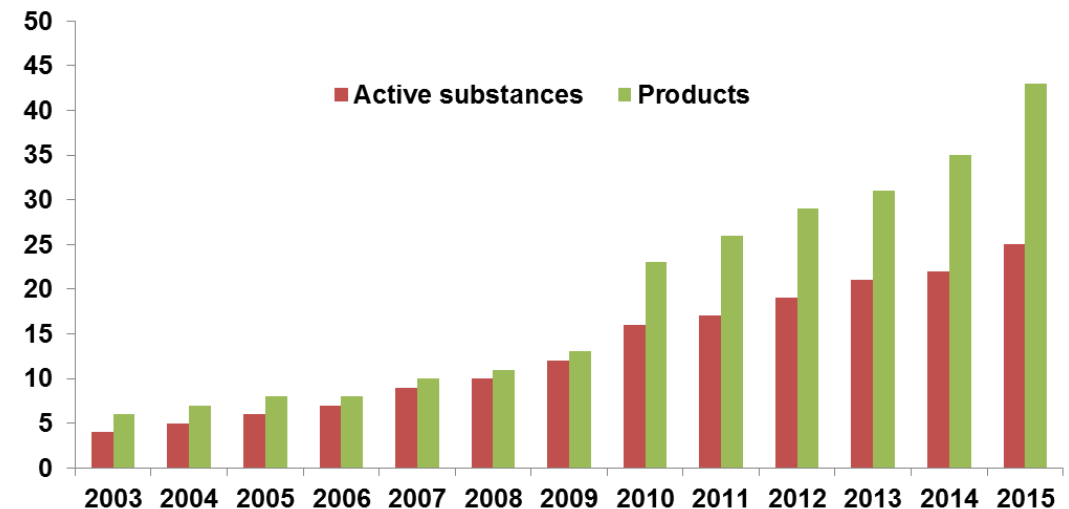
1. Plant health & crop protection
2. Addressing the labour challenge
3. Practical tools
4. Improving engagement & communications



IPM

- Integrated Pest Management
- EU Sustainable Use Directive on pesticides:
 - IPM is mandatory.
 - “biological, physical and other non-chemical controls must be preferred to chemical methods if they provide satisfactory pest control.”
- Likely to continue after Brexit (globalised food standards).

- New opportunities:
a rise in the availability of
biopesticides



Cumulative no. biopesticides in UK (2003-2015) CRD

Application & Management of Biopesticides for Efficacy and Reliability

The aim of this work is to have UK growers adopting new practices that have been demonstrated to improve the performance of individual biopesticide products within commercial integrated pest and disease management (IPDM) programmes

- 5 year program conceived & funded by UK growers
- protected edible & ornamental crops.
- Develop management practices to improve biopesticide performance, grower confidence & uptake.
- Consortium (WCC, RSK-ADAS, Silsoe Spray Application Unit, Roma Gwyn, Rob Jacobson)
- Project Lead – Dave Chandler
- Industry representatives

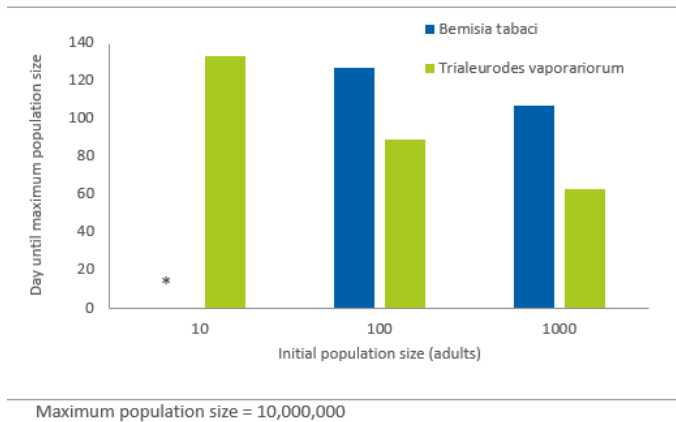


Pest Population Dynamics and Biopesticide Efficacy

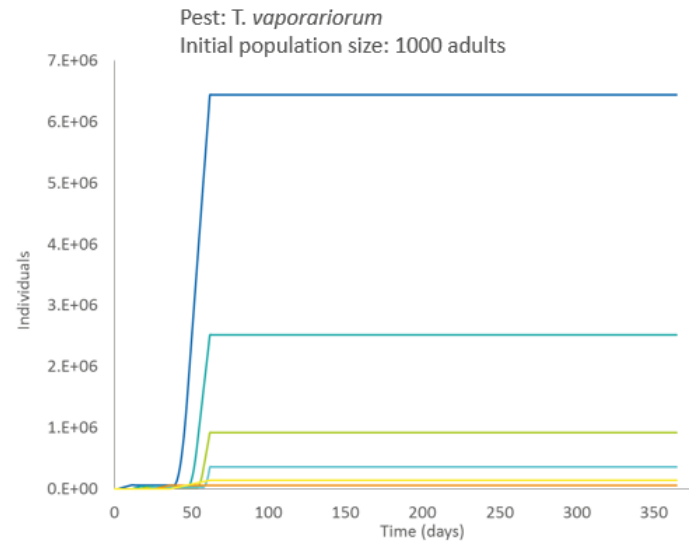
- Box car train model.
 - Model to predict pest population build-up and control with biopesticides has been developed
 - Depends on
 - Pest survival rate, fecundity, stage length, initial numbers.
 - Biopesticide: spray time, efficacy, age class susceptibility, persistence
- Initially focuses on whitefly (*Trialeurodes vaporariorum* and *Bemisia tabaci*) and EPFs (*Lecanicillium* and *Beauveria*)
- Aphids, Western Flower Thrips and spider mite are other targets to consider
- Effects of different crops to be investigated
- Potential to modify the model to include day degrees and incorporate temperature

Pest population dynamics and biopesticide efficacy

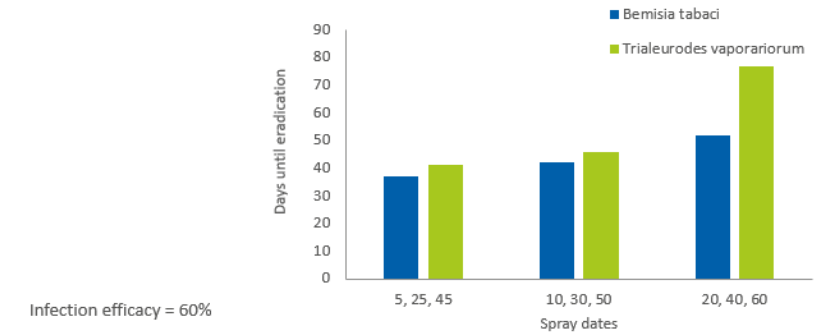
Predicted rates of population growth



Population structure



Effect of application date on EPF efficacy (using dummy data)



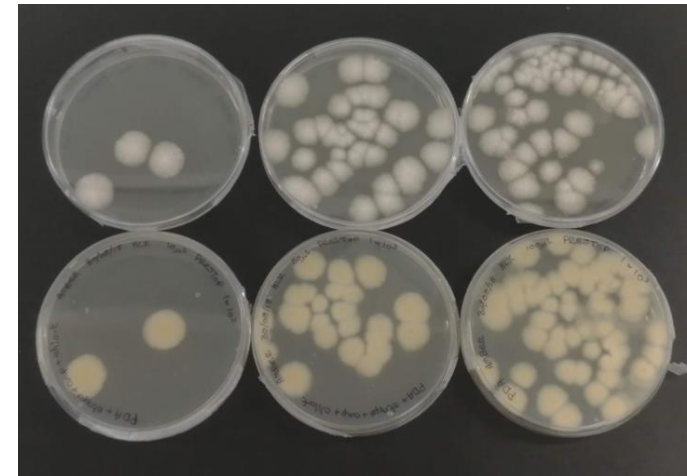
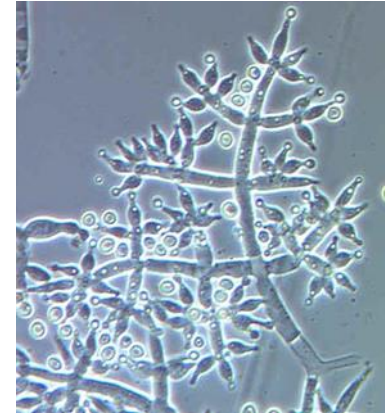
Better Delivery of Biopesticides to target

- Spray application optimisation.
 - Optimal water volume (% spray & MCA retained on leaves): spray calculator.
 - Focus on microbial biopesticides building on work conducted with entomopathogenic fungi
 - KE – spray application workshops
 - Focus for Ornamentals and Protected Edibles
 - Located at Borden Hill and Silsoe Spray Application
 - 1 - Basic requirements for good spray application in protected ornamentals
 - 2 - Spray application over floor and bench grown ornamental crops
 - 3 - Product mixing, agitation and cleaning
 - 4 - Incorporating biopesticides into your crop protection programme.



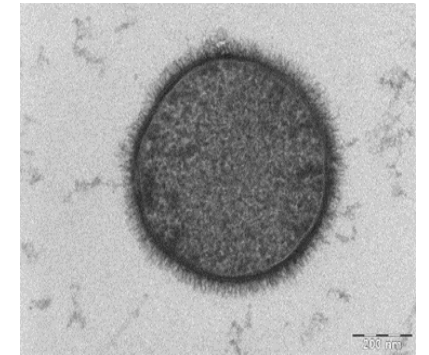
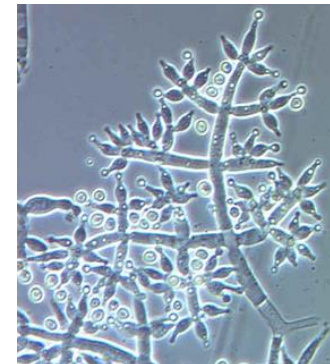
Current work: P&D control

- Persistence on foliage of MCAs (diseases)
 - Lit. review, data mining, experiments.
 - Persistence of *B. subtilis* (Serenade) on tomato.
 - Persistence experiments for AQ10 and Prestop
- Biopesticides on mushrooms.
 - Bioassays of biopesticides against dry bubble (*Lecanicillium fungicola*) + / - *Agaricus*.



Industry benefits

Help to get the best out of the biopesticide tool kit



Help growers to improve spray application, with recommendations on water volume, best way to deliver required dose

Improve information on timing and frequency of microbials

Develop some core principles that growers can use to optimise the use of biopesticides in IPM

Supporting IPM

Getting better performance from Biopesticides



WARWICK

Search Warwick

Warwick Crop Centre ▶ The AMBER project

What are biopesticides? | Biopesticides - pros and cons | Project details | Research plan | AMBER research team | Links

Helping growers get the best from biopesticides

Our research helps growers make better use of biopesticides. We work with professional growers of protected edible and ornamental crops.

The AMBER project

- Biopesticides are safe crop protection products based on micro-organisms, plant extracts and other natural compounds.
- AMBER is a research project to identify practical ways for growers to improve the performance of these products in their crop protection programmes.

Current research

- We're working to improve biopesticide spray applications.
- We're investigating how biopesticides affect pest population growth.
- We're studying biopesticide persistence on crop plants. This will help growers plan their spray programmes better.

News and Events

Spray application workshop

We're holding a biopesticide spray application workshop, 31st October 2017 at Silsoe Spray Applications Unit.

Lectures and presentations

Our next AMBER presentation will be at the



Factsheet 18/14
(HDC project CP 677)

Cross Sector

Getting the best from biopesticides

Tim O'Neill, ADAS and Roma Gwynn, Biorationalis Ltd

The number of plant protection products based on micro-organisms, botanicals and semiochemicals is gradually increasing. Such biopesticide products generally require a greater deal of attention during use than conventional chemical pesticides to obtain best effects. This guide describes the biopesticides registered as plant protection products and outlines how they can be used successfully as part of integrated pest management (IPM) programmes in horticultural crops. It discusses the types of biopesticide available and how they work, and their advantages and limitations. A list of biopesticides currently available in the UK is provided.

Action points

- Follow guidance on product storage; the effectiveness of biopesticides, particularly those based on micro-organisms, may be reduced if they are stored incorrectly.
- Always use biopesticides at the label or Extension of Authorisation for Minor Use (EAMU) recommended rate and spray volume.
- Follow label or EAMU guidance on timing and frequency of spray applications; many biopesticides work best when used preventatively and at a short spray interval, often seven days.
- Biopesticides may be adversely affected by other plant protection products. Conversely, it may be possible to tank mix or alternate a biopesticide with other biopesticides and/or a conventional chemical pesticide; always check the label or seek advice from a qualified consultant or the supplier.
- Adjuvants have been shown to improve the efficacy of some products but follow label or suppliers' advice.
- Some biopesticides may require application equipment to be adapted such as removal of in-line filters. Check the label advice carefully.
- Check that spray nozzle and pressure are appropriate to achieve good coverage throughout the target crop, including where appropriate the undersides of leaves; many biopesticides are contact acting and require good coverage for efficacy.



1. Progressive colonisation of virus-wound leaves by Maf22 Granular Insecticide (Mafentusium entomophagum)



HORTICULTURE