

Biocontrol usage, challenges & opportunities in ornamental crops.

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Ornamentals market

- Nursery stock



- Bedding plants
(annual garden plants)



- Pot plants
(House plants)



- Cut flowers
(Floriculture)



**Cropping cycles from a few weeks
to two years or more.**

UK Ornamentals market

- UK ornamentals industry is worth £1 bn
- 65% of market is hardy nursery stock (HNS)
- 25% bedding plants
- Rest is cut flower, house plants and other ornamentals.

- UK protected crops

- | | |
|---------------|----------|
| • Tomato | 220 ha |
| • Cucumber | 108 ha |
| • Pepper | 92 ha |
| • Soft fruit | 222 ha |
| • Ornamentals | 1,029 ha |

Ornamentals market - biocontrol

- **90% of UK pot plant growers use biocontrols**
- **80% of UK nursery stock growers use biological controls**
- **70% of UK bedding plant growers use biocontrol**
- **70% of Dutch rose growers practice IPM**
- **90% of Canadian ornamental growers are using biocontrol**
- **50% of US floriculture producers use some biocontrol**

Ornamentals market – Drivers for biocontrol

- **No residue issues in ornamentals**
- **Resistance management**
- **Restrictions on chemicals – re-entry / handling periods**
- **Lack of alternatives** (Western Flower Thrips often cited as a key driver) – drives the use of further biocontrol.
- **Grower / worker / retailer / consumer pressure to reduce chemical use and exposure**

Ornamentals market – the Challenges

- **Ornamental nurseries are rarely mono-cropping**
 - maybe over 500 plant species on a single site
 - diversity brings complications, with differing species and varietal susceptibilities to pests and diseases.
- **Very low threshold for pest and disease**
- **Cosmetic damage is not acceptable**
- **High value crops (up to £200k / ha)**
- **Global trade – introduction of pests and diseases**
- **Chemical residues on young plants.**

Ornamentals market – the Challenges

- **Variety of plant structures – application of sprays**
- **Establishing predators / parasites.**
- **Low temperature for nursery stock and bedding plants.**
- **Formulation issues** (for example loose bran formulations vs sachets)
- **Host plant effect on beneficials** (searching behaviour)
- **Biologicals as ‘contaminants’**



Ornamentals market – the Challenges

- **Requires a high level of technical input to keep pest numbers below an acceptable level.**
- **For natural enemies the challenges are often around establishment**
- **For biopesticides the challenges are often around application and coverage**

Ornamentals market – diverse issues

- **Pests**

- **Whitefly (virus)**
- **spidermites**
- **Thrips (virus)**
- **Vine weevil**
- **Scale insects**
- **Mealybug**
- **Aphids**
- **Tarsonemid mites**



- **Diseases**

- **Botrytis**
- **Mildew (powdery & downy)**
- **Bacterial diseases**
- **Root diseases (*Phytophthora*, *Pythium*, *Fusarium* etc.)**

- **Weed control**

- **Broad-leaved weeds**
- **Grass weeds**
- **Moss and liverwort**



Ornamentals market – examples of success

- Vine weevil control with nematodes and *Metarhizium*



- Whitefly with *Encarsia* & *Beauveria*

- WFT with *Metarhizium* and nematodes in growing media and *Neoseiulus cucumeris* on foliage

- Prevention of *Fusarium* with *Trichoderma* T34

- *Phytophthora* (and other diseases) with *Gliocladium* J1446



- Liverwort control with plant starch

- IOBC (Gent, September 2014) many examples of biocontrol on protected ornamentals

Ornamentals market - opportunities

- A large market
- A high value market
- A diverse market with multiple pests and diseases – many opportunities for differing biocontrols
- A technically driven market – systems approach required (IPM)
- Technology transfer is key to success

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