

## BIOLOGICAL CONTROL (INDOORS)



Photo: Tangmere Airfield Nurseries (CC BY)

### PROBLEM

Pest problems are a constant pressure on indoor production. Effective control is imperative and the use of chemicals is becoming increasingly limited due to loss of actives and maximum residue levels (MRLs). Pests are also becoming increasingly resistant to chemical plant protection products.

### SOLUTION

Biological control is a method of controlling pests such as insects, mites, weeds and plant diseases using other organisms. In indoor production, it involves introducing, encouraging and managing specific predatory species to help control pests.

### OUTCOME

Biological control can offer an effective and efficient method of pest control in indoor production systems. The controlled nature of the environment lends itself to introduction, management and control of predatory species, leading to effective pest control. There are a number of commercial companies offering solutions that are based on the ecology of pest and predator relations. Biological control is often cheaper than chemical alternatives and can replace the need for chemicals and their potential negative environmental effects. Consumer and supplier pressures are also encouraging a reduction in chemical usage and biological control offers an effective alternative.

### APPLICABILITY

#### Applicable production types



#### Application time

Throughout growing season of individual crops. Timing of predators required will depend on pests targeted to control

#### Required time

Biological control requires time to investigate appropriate species and find a supplier. Beyond that, it requires consistent maintenance and monitoring

#### Regulatory compliance

LEAF (Linking Environment and Farming) and Red Tractor Assured Food Standards

Biological control leads to a reduction of chemical use and therefore improved MRLs

#### Equipment/resource required

Predator species and associated equipment

#### Best in

Glasshouse and polytunnel horticulture production

## PRACTICAL RECOMMENDATIONS

### IMPLEMENTATION

- Consult your Crop Health and Protection Policy and ensure you are considering all 8 aspects of Integrated Pest Management (IPM).
- Consider current pest control mechanisms and where biological control could play a role or a larger role.
- There are a number of commercial companies providing beneficial insects and advisors providing advice. Investigate the options available for your pest and crops.



- There are three different approaches to biological control:
  1. 'Prophylactic' - meaning that the beneficial can live on something other than the pest and build up numbers in readiness for the arrival of the pest.
  2. Wait for the pest to appear - the beneficial can only feed and multiply if the pest is present. Most aphid beneficials fall into this category, they must have aphid present to complete a life cycle, so beneficials are introduced when the pest is at low levels.
  3. Introduce the pest and beneficial into the crop very early in the season, which inhibits the pest's development and allows early control. This is a newer technique and requires constant monitoring and management.
- The quality of the beneficials supplied is critical to the success of the overall IPM system. This needs to be checked as poor quality can be difficult to detect visually on delivery. Aim to get beneficials into the crop as soon as they are delivered, the longer the storage time the greater the decline in quality.
- Training staff is vital as they play an important part in the success of IPM. They are effectively the scouts in the crop.

## BENEFITS OF IMPLEMENTATION

- Initial investment is low and can lead to reduction in cost of chemical inputs
- Biological control is cheaper and easier than chemical alternatives.
- Lack of chemicals could be attractive to an export market
- Major driving force is reduction in actives available and MRLs
- Beneficials are in the crop working 24 hours a day, 7 days a week
- Introducing insects does not require any legal training, only good instruction
- Spraying crops is negative to their growth and development. Use of biologicals minimises the requirement for sprays
- Reduced spraying leads to more naturally occurring beneficial insects in the crop to help assist with pest control
- Reducing residues on produce is important to consumers and customers

## DRAWBACKS OF IMPLEMENTATION

- There are currently limited biological control options for fungal diseases

## BARRIERS AND RISKS

- Greater skill is required from staff to effectively monitor and manage pests and predators

## FINANCIAL ANALYSIS

The financial implications of the adoption of this practice were not estimated because of a lack of available data.

## RELEVANT LEGISLATION AND CURRENT INCENTIVES

- Legislative framework supports the use of biological control. Increased use of biological control leads to a decreased use and reliance on chemical plant protection products.
- There are currently no support payments available to use biological control.

## FURTHER INFORMATION

### Video

- Explanation of biological control within an Integrated Pest Management approach: <https://www.agricology.co.uk/resources/integrated-pest-management>



## Further reading and weblinks

- GWCT 'Sustainable Control of Crop Pests (2016). Available at: <https://www.agricology.co.uk/resources/sustainable-control-crop-pests>
- Andrew Burgess Agricology farmer profile. Available at: <https://www.agricology.co.uk/field/farmer-profiles/andrew-burgess>
- BioGreenhouse publications. Available at: <https://www.agricology.co.uk/resources/biogreenhouse-publications>
- 'Bringing in the bugs' (2016) (Article featured in The Organic Grower). Available at: <https://www.agricology.co.uk/resources/bringing-bugs>
- Rothamsted Research CROPROTECT Information Database. Available at: <https://www.agricology.co.uk/resources/croprotect-information-database>

## CASE STUDY FARMER APPLYING THE PRACTICE: TANGMERE AIRFIELD NURSERIES

**Location: West Sussex**

**Size: 30 hectares**

**Enterprises: Peppers**

Tangmere has three main ways to manage pests when they arrive in the crop. We introduce beneficials that can feed on something other than the pest before pests arrive, in readiness. Orius and Swirski are both good examples of this, as they live on pollen in the absence of thrip. They change from the pollen to the thrip when it's present because the thrip has a higher protein content.

Another tactic is to wait for the pest: The beneficial can only feed and multiply if the pest is present. Most aphid beneficials fall into this category, they must have aphid present to complete a life cycle. So at Tangmere we introduce beneficials at a low level, even when we have not observed the pest in the crop.

Finally, we have 'Pest in First'. This technique requires a high level of skill and something of a leap of faith the first time you do it. To introduce the pest and beneficial into the crop very early on in the season means the pest cannot develop that fast, the days are both short and not that warm. On a weekly basis you check how the pest is developing and the beneficial numbers. Gradually as the weeks pass, we make corrective applications of beneficials as the red spider mite multiplies and spreads in the crop. There comes a certain point in the season where you will have created a natural balance and achieved 'equilibrium' throughout the crop. The beneficials will not eradicate all the pest and the numbers are held at an acceptable level. This all happens before there is any real pressure from naturally occurring red spider mite, and when it does come into the crop the beneficial is there ready and waiting for it.

Biological Control is a critical management technique for us and fully embraces best practice by producing more, with less impact on the environment.

See: <http://www.tangmere.co.uk/how-we-grow/looking-after-crops>



*Orius for controlling thrips biologically*

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## ABOUT THIS PRACTICE ABSTRACT

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[www.agricology.co.uk](http://www.agricology.co.uk)

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