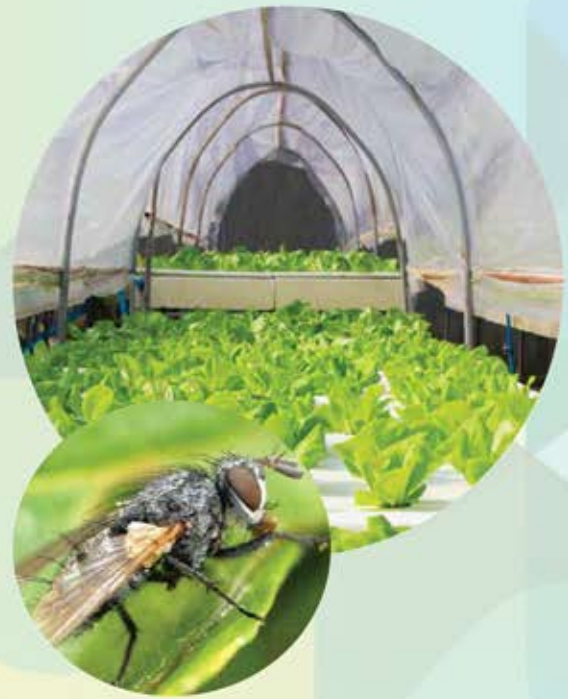


# Bio-Control

Biological control uses living things to reduce numbers of pests and pathogens. It's often used in organic farming, as an alternative to synthetic pesticide chemicals. It's often only suitable for use on a small scale, for example in greenhouses.

## Examples:

- In greenhouses, white fly insect damage can be controlled by using a parasitic wasp, which lays its eggs inside white fly eggs.
- *Bacillus thuringiensis* bacterial spores can be sprayed onto crops to control specific caterpillar, beetle and fly pests.



# Benefits

## 1. Environment:

Compared to synthetic pesticides, bio-control is less fossil fuel dependant, which helps to reduce CO<sub>2</sub> emissions and could also make it more affordable in the future.

## 2. Mobile:

Bio-control can be used to target mobile insect pests. Researchers in the USA are attempting to control the winter moth pest by releasing a parasitic fly (*Cyzenis albicans*), which preys on the moth.

## 3. Plant growth:

Some bio-control agents can also increase plant growth. For example, maize seeds coated with the fungus *Trichoderma harzianum* strain T22 show much more growth. It's thought that the fungus helps plants absorb nutrients from the soil.

# Drawbacks

## 1. Reduced yield = more land:

Lower yields are often seen with bio-control in comparison to pesticide sprays, meaning that less food can be grown on the same area of land.

## 2. More time:

Bio-control often takes longer to work than synthetic pesticides and several releases of beneficial species, which are needed to reduce pest and pathogen numbers.

## 3. A complex web:

The relationships between different living things in an area are very complicated and so the effects of bio-control are difficult to predict. For example, harlequin ladybirds have been introduced to help control an aphid pest. However, now these ladybirds are growing in numbers and causing native UK ladybirds to decline.

