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Biological control is no longer viewed as a control strategy on the fringes of acceptability, but as a real alternative to pesticides.

By Graeme Murphy

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# Growers take another look at biocontrols

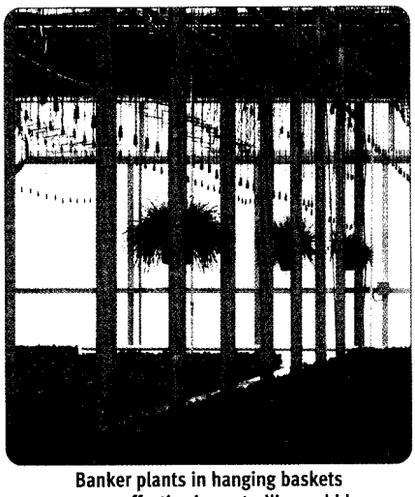
BIOLOGICAL CONTROLS are becoming more mainstream as more growers realize they can play a very important part in their overall pest-management program. The ornamentals industry has come a long way from the early 1990s when innovative growers took the first tentative steps down this new road. Much has changed, including new pests, pesticides and biocontrols. The most common reasons for growers adding biologicals are reduced effectiveness of pesticides and the lack of alternatives.

Growers not using biocontrols give these two main reasons:

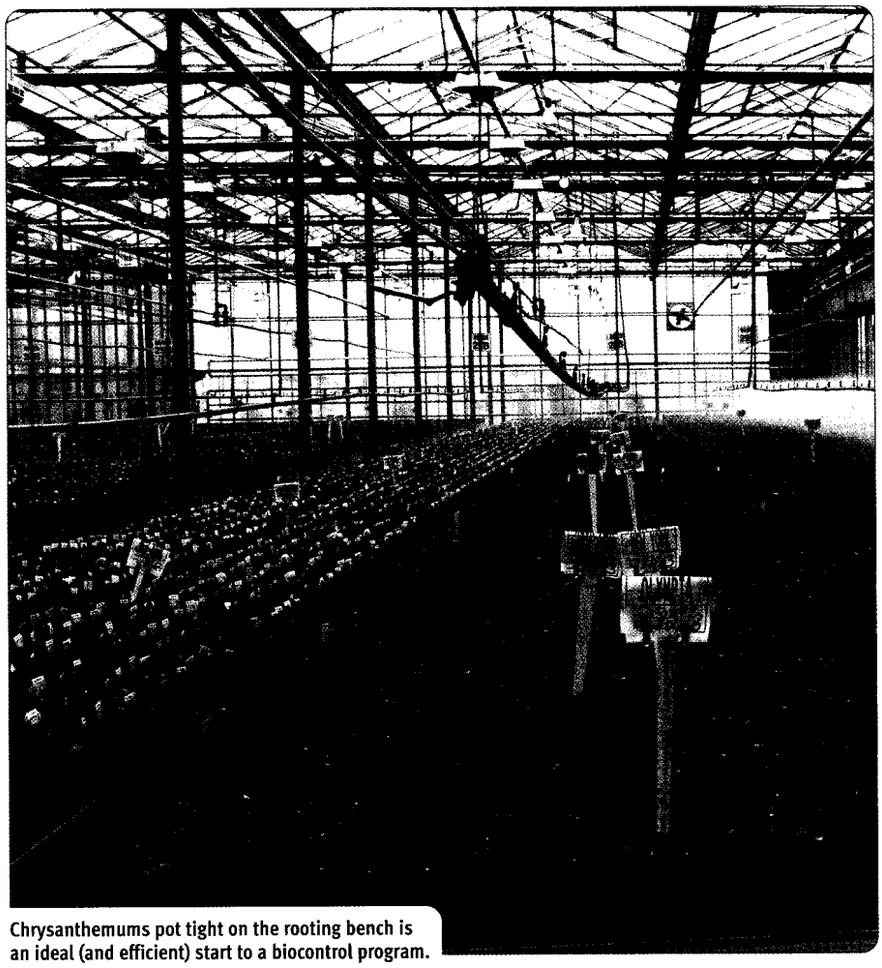
1. They perceive biocontrols to be less effective than pesticides.

2. They believe that biocontrols are more expensive.

It is easy to understand where some concerns about biocontrol effectiveness come from. In the early days of biocontrols, failures outweighed



**Banker plants in hanging baskets are very effective in controlling aphids.**



**Chrysanthemums pot tight on the rooting bench is an ideal (and efficient) start to a biocontrol program.**

## Stock plants offer biocontrol haven

Some growers have mother stock plants that they maintain year-round. These stock plant crops are an ideal place to use biocontrols for several reasons:

- They usually don't have flowers.
- The crop is often long term to allow the biocontrol plenty of time to establish.
- They are very intensive with the future crop (unharvested cuttings) being crammed into a very small area. This allows biocontrol agents to move with the cuttings into other greenhouse production areas. Some of the most successful biocontrol programs in Ontario started with stock plants.

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successes, and bad experiences tend to linger in growers' memories. Early biocontrols were not as good as those available now. Many pesticides applied 15 years ago were not exactly biocontrol-friendly.

It is not easy to prove that biological controls work. However, word of mouth among growers is increasing

## Mum grower offers case study

Here is a real-life case study from a grower who has been able to maximize the effectiveness of biocontrols while keeping costs down.

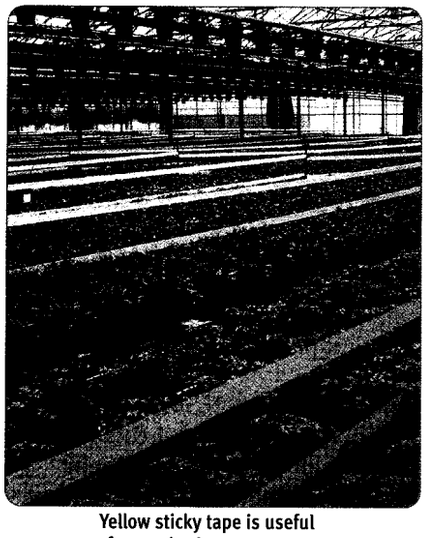
**The situation:** A weekly pot mum grower is battling to control thrips and spider mites. This ongoing battle uses pesticides. It has been fought for several years and the pests were winning.

**The setting:** The grower, his IPM consultant and the biocontrol producer developed a new strategy. The grower noticed several mum varieties were especially attractive to thrips and mites. The grower roots cuttings in a long-day propagation area for four weeks. In this area, plants are spaced pot tight, and high temperatures and high humidity are maintained, which are ideal conditions for establishing and spreading predatory mites.

**The strategy:** Weekly introductions of predatory mites into this rooting area covered all varieties very efficiently. When plants were spaced out into the main greenhouse under short-day conditions, the focus of the program switched to varieties most attractive to thrips and mites. Predatory mites were placed only on these varieties, which were monitored closely.

**The outcome:** This strategy of focusing on susceptible varieties has worked very effectively for several years.

**Mum 'Saskia' is very attractive to thrips. It has been used to focus biocontrol programs for this pest.**



Yellow sticky tape is useful for monitoring programs.

the number of success stories, and that is probably as effective as any other way.

## 4 steps to success

For biocontrols to be effective, at least four things need to be in place.

1. **Good planning.** Success is more likely if you work with people who have experience in biocontrols (other growers, biocontrol technical specialists, extension specialists and consultants). Ensure that pesticide residues won't be an issue and choose the right crop, pest and area of the greenhouse and time of year to maximize the chances for success.

2. **Monitoring programs.** Good monitoring programs are critical for pest populations and for the populations of natural enemies. Different monitoring strategies may be necessary. Yellow sticky cards work well for flying biocontrols such as parasitic wasps. Where predatory mites are used, a sharp pair of eyes and careful plant inspection are necessary to detect these very small mites as they move on the leaves.

3. **Adaptability.** Biological controls involve more than releasing biocontrol agents at some predetermined rate and waiting for them to work. Every greenhouse situation is unique in regards to the crop (and how it is scheduled), the greenhouse structure (glass vs. poly vs. screen house), the environment (heating, venting, irrigation systems, whether

the crop is grown on benches or on the floor) and the location (Canada vs. regions in the United States). Growers need to take advantage of their own situation and adapt the program to their conditions.

4. **Patience.** Realistic expectations are important. It is unrealistic to expect biocontrols to provide perfect control of pests within a few months when pesticides have been unable to do it despite years of use.

## Costs are higher, at first

There is no question that the costs of biocontrols can initially cause some heart palpitations. However, if growers begin using biocontrols in response to poor control with pesticides, then it is probably safe to assume that:

- There is a well-established pest population in the greenhouse and biocontrols will have to play catch up.
- There is likely to have been excessive pesticide use in the period leading up to the decision to go to biocontrols. This will result in residues that will retard the establishment of biocontrol populations.

For these reasons, growers new to biocontrols often spend three to six months trying to bring down pest populations and applying pesticides with residues that minimize the impact on biocontrols. Even then, it can take time to establish a biocontrol program and exert control over target pests. This period of time is often referred to as the six- to 12-month "hump" that growers need to overcome when they first start a biocontrol program.

This establishment period can be difficult in terms of the effectiveness of the program and its costs. Being aware of this at the start of the program takes away some of the surprise factor.

As biocontrol programs become well-established and growers continue to use them in successive years, costs usually are similar to those of pesticide-based programs.

## 2 biocontrol tools

**Yellow sticky tape.** Large quantities of yellow sticky tape can be useful in

**Eggplants can be used as a trap plant for greenhouse whitefly and a release point for parasitic wasps.**

supporting a biocontrol program, especially where predatory mites are the primary control strategy. If parasitoids are used, the sticky tape may catch unacceptably high numbers of biocontrols.

**Banker plants.** Banker plants have been used since the early 1990s for aphid control. They encourage the buildup and continual presence of aphid parasitic wasps in the greenhouse, resulting in more timely and efficient control of aphids.

Other banker plant systems have been used. University of Florida entomologist Lance Osborne developed a banker system for the predatory mite *Phytoseiulus persimilis* using corn plants infested with a mite called Bank's grass mite and another using papaya whitefly to produce parasitic wasps for whitefly control.

Growers in Ontario have successfully used eggplant and tomato to attract greenhouse whitefly and encourage the buildup of the parasitic wasp *Encarsia formosa*.

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