

Starting a Biological Control Program: Challenges and Rewards[©]

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Prides Corner Farms is a large nursery with mostly outdoor production. We grow trees, shrubs, roses, perennials, and herbs. The plants and the conditions that beneficial insects are going to be used in are very important. Using biological control with indoor production is generally more successful than outdoor production because the environment is enclosed and can be controlled. Our biological control program focuses on using beneficial insects on Sara's Superb Herbs, which are produced in heated greenhouses in the spring.

There are numerous challenges to beginning a biocontrol program. First of all, at least one person on the farm must learn about all the beneficial insects and their behavior to determine which ones are right for your situation. There are numerous beneficial insects that are marketed by the biocontrol companies. Each beneficial insect behaves in a certain way that affects whether it will be effective in your operation. To illustrate the need to learn these insects, we will look at the aphid biocontrols. These include: *Aphidoletes aphimyza* (predatory gall midge); *Aphidius colemani* (parasitic wasp); *Aphidius ervi* (parasitic wasp); *Aphelinus abdominalis* (parasitic wasp); *Chrysoperla* spp. (predatory lacewing); and *Adalia bipunctata* or *Hippodamia convergens* (predatory lady beetles). Within these beneficial insects, not all life stages feed on aphids; some need special programs, like banker plants, to be successful (*Aphidius* spp.); most are highly perishable; some are cannibalistic (*Chrysoperla* spp.); some only feed on specific aphid species (*Aphelinus* and *Aphidius* spp.); and most need to be released preventatively (will not clean up infestations).

In addition to learning the insects, there are many suppliers and products that affect the outcome of a biocontrol program. Several companies produce beneficial insects including Biobest, Syngenta Bioline, Koppert, Applied Bio-Nomics, and IPM Labs. Within these companies, lead times, ordering dates, availability, quality, and prices are just a few of the differences. Biocontrol insects are available in different quantities, mixes, and with different carriers or release devices. Each company has different names for each of the insects and forms. Quality and freshness are very important, and the different companies produce different quality products. It is a little bit of guesswork and trial and error to determine which companies and products work in your company's situation.

To start a program, it is important to first make a plan. Determine your crop and the associated pest problems, and then choose multiple biocontrols for each pest problem. Begin applications as soon as plants are stuck or seeded, and increase the quantities and application frequencies as plants get larger. Be willing to spot spray to control hot spots.

Trial and error is an important part of any biocontrol program. Begin with a plan but be prepared to change it as you go. Try different suppliers and different packaging to determine which works for you. Also, learn application frequencies and quantities, and which biocontrols work for your set-up and crop (crawling vs. flying

insects, pest pressure, and time of year). Be prepared to spend more on biocontrols the first year or two before it begins to pay off economically. It is important to keep track of the levels of pests versus predators, so developing a scouting and monitoring system quickly pays off. Biocontrols are largely a preventative program, so monitoring for pest populations will help you decide when and where to apply more aggressive beneficials or whether to spray for hot spots.

There are many rewards that come with using a biocontrol program. Many times the challenges faced during the establishment of a program lead to solutions to larger problems. At Prides Corner Farms, first year challenges with our biocontrol program led to larger changes in the herb program. We re-thought the schedule of planting dates, and re-worked which plants to group together for ease of care. Thinking about ways to improve the biocontrol program led to ways to improve the crop overall.

We also re-examined our growing practices. We really had to think about sanitation and proper crop handling to avoid issues that we would have previously dealt with using chemicals. This led to improvements with crops that were still being grown traditionally.

Another reward was that we used less chemicals. We didn't have to spray insecticides on our herbs at all this spring. The limited insecticides that were available were not very effective in the past years, so we actually had cleaner plants. There was less worker disruption due to spraying, and worker safety is improved whenever we don't need to use chemicals.

In addition to using fewer chemicals, we also began using softer chemicals farm-wide. The need to use chemicals that are "softer" on the beneficial insects gave us more experience with new or low impact chemicals. Familiarity with these less harmful chemicals led to using them more farm wide. There was also a growth of interest in environmentally friendly products or chemical alternatives like Root-Shield[®], compost tea, nematodes, water sanitation systems, organic fertilizers, Jiffy[®] pots, etc.

Finally, be skeptically optimistic about what the "experts" are telling you, as each situation is different. Educate your employees and co-workers — most people find beneficial insects interesting, and they will appreciate that you are exposing them to less chemicals. Also, know when to cut your losses, but don't give up too easily!