



Keeping Track of Good Bugs

When implementing biological control, there are many factors to consider. Some of the most fundamental factors are how, when and where to buy beneficial insects and mites.

Bug Smart

The first step is to select a supplier. It is essential to become an educated consumer when considering the use of biological control as a component in an integrated pest management (IPM) program. Get to know your supplier, ask a lot of questions, and in return your supplier should be asking you questions, too. Answers will only help build your knowledge base and help your IPM program run more smoothly and efficiently. Once the supplier understands your specific situation, he can help set up a program catered to your needs.

Some technical questions that should be asked between buyer and supplier are:

- What are the interiorscape conditions? Insects can't survive in all conditions.
- Temperature highs and lows?
- Humidity level? Humidity makes a difference with life cycle development.
- Pest being targeted? There are many species of pest insects. Predators and parasites can be host-specific.
- Plants? Different plants have different pest complexes.

Above The Big-Eyed Bug, *Geocoris punctipes*, preys on aphids, spider mites, whiteflies, caterpillars and chinch bugs.

- What chemicals have been used on the plants?

Equally as important is choosing the most beneficial insect, predatory mites or entomopathogenic nematodes for your project. It is essential when ordering beneficials that you know what species you are ordering.

Many people starting a biological program will simply ask for predatory mites. But this can mean different things to different people. Commercially, there are several species of predatory mites available that control different kinds of pests. By ordering the wrong species of insect or mite, your program will fail. By knowing and using taxonomic names, mistakes can be avoided.

Here To Prey

When the big day comes and the box of beneficials has arrived, be sure to inspect it for damage. Most companies ship in large, overnight boxes, with the insects placed in a styrofoam cooler packed inside. Coolers help regulate temperature during shipment. Generally, a cold or cool pack will also be included. Many suppliers apply "perishable" labels to the box to ensure prompt delivery.

Once your box is opened, check that the insect containers are wrapped in packing materials and did not roll during shipment. Depending on what type of natural predators were shipped, the temperature of packs can vary. For example, entomopathogenic nematodes (nematodes that kill insects), are very susceptible to cold damage, so they are shipped with cool packs instead of ice packs.

When they arrive, they should be at room temperature. Most companies will pack an information sheet containing the product's name, including genus and species, biology information and the packing date, which is very important. Check the date so you know how long the package was in shipment.

If shipping time is longer than what the supplier stated, contact him immediately to find out if the extra time will affect the viability of your beneficials.

Seeing is Believing

Many natural predators will come packed in bottles filled with a carrier such as buckwheat hulls or vermiculite. Others may arrive on cards and on sponges. Most are very small, which makes it difficult to assess quantity or whether they are subsisting. Mites, if allowed to warm to room temperature, will become active enough for you to see.

Other natural parasitic predators, such as *Aphidius colemani*, an aphid parasite, arrive in the dead bodies of their host. It is a good idea to save a few in a container and put them on your desk to keep track of when, or if, they hatch. ❁

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Correction: The mealybug photo used in the September/October issue was supplied by Dr. Lance Osborne. We very much thank Lance and regret this oversight!