

GROWERTALKS

Features

4/1/2018

The Care & Feeding of BCAs

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I thought I knew the basics of caring for biocontrols: get them in, pop 'em in the fridge and use them as soon as you can. But that's not the case. The biggest thing I learned while writing this article was that biocontrols aren't for those people who don't read the instructions. But if you take the time to do your research and care for each biological control agent in its individual way, you can be successful with biocontrols, too.

Everyone I spoke with was emphatic about the importance of having a plan before you start ordering—the last thing you want to do is have them arrive without a plan to use them or a way to store them. It's crucial to know the lifecycle of the pest you're trying to control, so you can use the biocontrol at the correct time for maximum efficacy.

Also, as biocontrols can be so specific in their target, it's necessary to know which biocontrol attacks the pest you anticipate a problem with. Biocontrols need to be ordered ahead of time, so start out the season knowing what you need. After all, as Albert Grimm said, "When we see the pests, we've already lost."



Signed, sealed, delivered ... they're yours

Biological controls should be used as soon as possible and many aren't able to be stored and still remain alive and effective (nematodes excluded—they can be stored for several weeks).

Albert Grimm, Head Grower at Jeffery's Greenhouses in Ontario, Canada, described how other than a few similarities, each biological control agent has to be handled according to its unique needs.

"Generally, we hold them at 18 to 20C (64 to 68F) and we are trying to distribute them as quickly as possible," he said. "Beyond that it becomes very complicated."

Pictured: Aphidius colemani in a blister pack release method from Bioline AgroSciences.

They don't have to be fed to stay alive during storage, but Albert said he uses several different sources of supplementary insect or mite food to support the predator populations in the greenhouse.

"We have learned that, for several species, 'fresh' [i.e., non-cooled] sources of biocontrols are worth the extra money," he added. "In other cases, it doesn't make a difference. So, again, this is a case by case issue."

Roger McGaughey, Senior Head Grower at Pioneer Gardens in Deerfield, Massachusetts, says that biologicals are ordered usually by the Thursday of the week before you want to use them and come in on Tuesday of the next week.

He says that at Pioneer Gardens, before they come in, Head Grower Amanda Mattison and her staff identify and flag the tables that are to be treated so they're ready to use the material as soon as it comes in. The biological agents are fragile and alive, so they need to be put on the crop as soon as possible. Roger also advises to be sure to check them when they come in; turn the tube around, open the container and pour some out onto a paper plate to check to see that the insects that are supposed to be there are present and alive.

You can store most types for a few days if you would want to apply more at the end of the week, if you're producing more tables. They can be kept if you keep the tube on its side in a shaded area at 50 to 55F (10 to 12C) in the greenhouse.

Ronald Valentin, Technical Lead and Commercial Manager—North America at Bioline AgroSciences, explained that the biggest thing to keep in mind with biocontrols is to not store them; use them right away. If growers have to store them, they can for a day or two, but there are different conditions that need to be met for different biocontrols to keep them alive. He says that sachets are probably the product that can be "stored" the longest, as they contain a breeding system.

There are several delivery systems offered for biological controls, even within one species. They can come in sachets of different sizes and configurations, such as bags, tubes and blister packs. Biological control suppliers have documentation listing how your biologicals will come to you, as well as what to do when you get them, so don't be overwhelmed by all of the options.



Biologically inclined

With so many different specifications for handling and storage, it may be a bit intimidating to take the plunge and get involved with biocontrols. But there are lots of sources of information and knowledge to help get you started.

Pictured: Aphid mummies on pepper plants being used as aphid banker plants.

Albert emphasized the importance of learning from other growers.

"Find as many other growers as possible who are also using biologicals, form a group and share as much information and learn as much from each other as possible," he said. "No grower can create a functioning biocontrol system on their own."

He also advocates a change in the way of thinking.

"We need a paradigm shift in how we think about pest control. With biological control in ornamentals, we're not controlling individual pests with a chemical or biological pest control agent. Instead, biological control becomes a systems approach, where we look at the greenhouse as a controlled ecosystem in which we shift the balance between pests and predators so overwhelmingly to the side of the predators that the pests don't stand a chance."

Biocontrols can be fragile and temperamental, and there's a lot to learn about how to successfully handle, store, and use them effectively. But with the right knowledge and an action plan, you can be successful with them. If you've never used them, reach out to other growers that have had success with them. Attend workshops or seminars to learn even more because growers, suppliers and educators who embrace biocontrols love to share their knowledge.

Cheat sheet for the most common types of BCAs

Amblyseius cucumeris, *Amblyseius swirskii*

These predatory mites are to be used within 18 hours of receiving them (sachets should be used within a week) and kept out of direct sunlight. *Amblyseius cucumeris* needs to be transported and stored at 50 to 59F (10 to 15C) and above 65% humidity, while *Amblyseius swirskii* needs to be stored at temperatures above 59F (10C) and above 65% humidity. Even closely related species of predatory mites need to be stored at different temperatures, which should give you some idea of how unique the handling requirements can be.

Aphidius colemani

This small parasitic wasp preys on aphids. They're most effective from September to June, as their own parasites aren't present. They should be kept in low light, with temperatures from 50 to 76F (10 TO 26C). Carol Glenister at IPM Labs said they have a unique offering of aphid banker plants (called Aphid Guard). Their banker system includes a barley plant and a supply of bird cherry oat aphids, which only attack grasses, not broadleaf crops. Once these aphids are well-established, growers add *Aphidius colemani*, which uses these aphids to multiply a hundredfold. These parasites then seek out aphids throughout your crops. Per IPM Labs, while it may seem counterintuitive to buy in aphids, it's actually an economical way to produce your own natural enemies.

Nematodes

Roger McGaughey said that nematodes are his favorite biological control agent and he explained his process to us. They're unique in that they're diluted in water and sprayed onto the crop—as opposed to insects, which are released onto crops. Roger says you can buy nematodes in and store them in a fridge for up to four weeks. These organisms have a bit more flexibility than others we've mentioned.

He explains that you need to make sure the conditions are right: a cloudy day. Use a shadecloth if you have to or even get up early in the morning and turn off horizontal airflow fans before application.

"Make sure to check your sample of nematodes, and if they are moving around and curly, you are good to go. If they're straight, they might just be cold. Otherwise they're dead," he explained.

Rogers said that they apply nematodes to all of their crops every week at least once, maybe twice in summer, to control fungus gnats and thrips. They mix them in a tank with water and a spreader/sticker. You can also put in a foliar fertilizer or a calcium supplement.

"If you're spraying, the more you can put in the tank at one time, the better. Anybody can do this; you can get your 10-year-old kid to get in and wield a spray wand," jokes Roger.

He says that nematodes can be applied with a sprayer or a Dosatron, but make sure the solution is agitated or aerated and use the solution in a couple of hours so the nematodes don't drown. He also notes to make sure the foliage stays moist for at least two hours after application.

"Done correctly, it really works," said Roger. "We haven't had a thrips problem for years." **GT**