



## How Biocontrol Agent Release Technologies for the Greenhouse Are Evolving

By [Erica Hernandez, Griffin](#) | October 16, 2022

Biological control agents (BCAs), beneficial insects, mite, and insect predators are a hot topic among growers looking to reduce their pesticide use and environmental impact. No matter how plants are being grown – in the greenhouse, in the field, or even warehouse production – there exists a BCA release strategy appropriate for that setting. Modern insectaries actively test out new release strategies in both traditional, low-tech operations and modern, technology-heavy settings to fine tune product performance. This article will review traditional methods alongside some exciting developments in the field of BCA release technology.

### **Bulk Distribution**

The most basic way to deliver BCAs is via bulk release. Bulk product consists of a loose carrier material such as peat, vermiculite, bran, or rice hulls with live insects or mites mixed in. These products often come in relatively large volumes, from 4 ounces up to several liters. . When using 100% bran carrier and predatory mites, growers sometimes create “breeder piles” at the base of plants.

It might seem odd to introduce additional debris like vermiculite into BCA bulk releases, but carrier material plays a vital role. To begin with, shipping and handling of BCAs is not always smooth. Carrier materials provide a buffer and padding against rough handling and keeps insect or mite predators comfortably spaced. Carrier also provides a way to ensure even mixtures and applications by allowing growers to homogenize through gentle rolling or turning motions just prior to application. Certain carriers, such as bran, support colony development and longevity. In the case of bran, it provides a food source for bran mites, which serve as feeder mites to the predator mites. Aside from breeder piles, most bulk releases remain effective for one to two weeks.

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## **Sachets**

The next most common release technology for predatory mites is sachets. Sachets come in various forms for different applications, but all have the same basic anatomy. The common attributes include a small, water-resistant, reinforced packet, usually smaller than a ; filling made up of some carrier material along with predator mites; feeder mites or other food source to support a developing breeding colony; a small pre-punched hole for predators to exit the sachet; and some method to support the sachet in placement. Hanging sachets come fixed to paper or plastic hooks, allowing the sachet to be suspended inside the crop canopy. Sachets on sticks come attached to sticks of varying heights, for use either at the base of plants in pots or placed into flats or propagation trays. Some insectary companies have taken this release technology to the next level, providing several specialty sachet options. Gemini sachets come as a pair of folded-over, water-resistant sachets, to be used in crops where overhead watering is common. The release holes are protected inside the fold to prevent any moisture infiltration. Finally, Bugline products are long strips of connected sachets that can be quickly and easily laid across benching to create “bug highways” for predators.

Positioning of sachets is critical, as predator mites typically only roam about 2 feet in any direction from the original sachet and perform best when kept out of direct light. Having a multitude of options to position and secure products allows growers to place sachets in the highest impact areas regardless of plant form or support structure availability. Positioning is doubly important for sachets as are they are intended to be left in place for the duration of the crop. Predator release generally happens over the course of four to five weeks.

## **Blister Packs, Quick Release, and Cards**

Blister packs, quick release sachets, and eggs on cards may look similar to sachets (hung on hooks and hiding in the canopy) but perform very differently over time and are a relatively new release technology. All three of these technologies are intended for a quick release of various predator species, not just mites, and are intended as short-term fast treatment options. Use of blister packs and fast release sachets mimics the quick bump in predator population of bulk releases, without adding additional debris onto crop canopies. Gluing eggs to cards also runs the risk of encasing predators in glue and preventing them from emerging; blister packs avoid this issue entirely. Beyond mite releases, blister packs are used to release various aphid predators, such as *Aphidius* spp, as well as other parasitoid wasps. With a shorter effective lifespan, these products often include just carrier and predators (in the case of blister packs) or eggs with a very limited food supply to get populations moving (in the case of eggs on cards). The products encourage predators to spread out quickly over the course of a week from the original release point, with no support for a potential breeding colony.

## **Specialty Products**

Though BCA use in horticulture has been an established practice for many years, new techniques are constantly being developed alongside other technology. For example, the popularization of drone technology has spurred the creation of Parabug, a drone-assisted field application of bulk BCA products. Through the use of specialized drones, releasing large amounts of predatory mites and insects over larger areas becomes much more labor-efficient; the size and scope of agricultural fields have often made spray applications the best choice for pest control in the past. In the opposite scale direction, sometimes growers need to treat individual colonies in a highly controlled fashion, where a bulk release

or sachet application would be either overkill or less immediately effective. The Touch Tip Hot Shot release method developed by Bioline takes advantage of physical packaging shapes and the natural tendency of mites to crawl upward. Hot Shot releases are highly controlled and location specific, best used in very small grower scenarios or to treat individual pest colonies.

As long as pests can find their way onto plants, growers will need new and evolving tools to combat these invaders. Whether growing acres of crops in a field, a single zone in a greenhouse, or a couple tiers of plants in a warehouse, there is an appropriate BCA product available.

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