BCA Releases. Execution of application is an important element for success!

First of all, BioControl Agents (BCAs) are live insects and mites, so you have to do your best to handle them smoothly and provide them optimal conditions. You want to get the higher live ratio and let them focus on their mission : Hunting.
The release is mainly linked to the moving capabilities of the BCAs. For example, predatory mites do not fly, parasitic wasps can fly:
The sedentary insects (which don't fly) need to be released as close as possible to the prey.
The nomad insects (flying ones) can cover larger areas from the releasing place usually a specific habitat where they found what is necessary to live and reproduce.
Another thing to remember is that in many cases the BCAs that are released are not the ones that are going to do the job. It is the next generations after establishing a population in your crop that is going to do the weight lifting.

1- Hot spot treatment

Biocontrol Agent Concerned : Mites (*Amblyseius cuccumeris, swirskii, californicus, andersonii*), *Orius insidiosus*,

Convenient for

Sedentary pests like spider mite or aphids

Having a zone with different crop which is more sensitive to one pest

As it is not big release areas, it is possible to :

Increase rate of application

Use more efficient (usually more expensive) BCAs

Application : spread directly on plant shaking the container (shaker)

Mostly used as curative treatment

2- Overall broadcasting

Biocontrol Agent Concerned : Mites (*Amblyseius cuccumeris, swirskii, californicus, andersonii*)

This is the most common way of releasing predatory mites (although for the Amblyseius species mites not the most cost effective way → sachet are a higher return on investment = breeding systems)

Convenient to cover larger areas quickly (you can work with blowers → see attached document)

Limit of this is that some BCAs are lost on the floor.

Application : Blower for big areas

Spread directly on plant shaking the container (shaker) for smaller areas

Mostly used as inundative treatments

Application is the tricky part as you want to be even over the whole area and make sure you have enough to finish your block.
Applicator has to focus at all time and control his spreading rate (area covered with known quantity = container). On top of having the perfect pendular (Right to left to right), the applicator has to keep a consistent walk speed. Also, making sure the applicator reaches the back of the table or zone.
Depending on the media (vermiculite or bran), there can be a vault in the hopper that reduce the rate.
Spreading live animals, we are never sure that we don't hurt/damage them during the process.
For all those reasons, the applicator need to be trained and needs experience to do a good job.

3- Sachet/Blisters applications :

Biocontrol Agent Concerned : Mites (*Amblyseius cuccumeris, swirskii, californicus, andersonii*)

Convenient for high margin plants as sachet hanging is time consuming.

Much better ROI than blowing and last at least 4 weeks (sachets can last between 4 and 8 weeks depending on temperature).
It is usually an efficient alternative to overall broadcasting and it doesn't require as much experience from the applicator.

Application :

Make sure the sachet is oriented in a way that overhead watering cannot get in through the releasing hole. . Sachets are designed to handle water, but there are limitation on how much water and application (misting and light boom watering no problem, heavy boom or 'firehose' watering are a problem.

If tall plants, make sure that the sachet is close to the pest habitat (top of the plant) as mites have usually a limited mobility range

If canopy is not very dense and there is no plant contact, you need one sachet per plant as mites can't fly
For Blister packs, make sure blisters are not in full sun exposure as the pupa in the blister will not survive the 'greenhouse' effect in the blister. (See pictures)
NOTE : do not store sachet under dry conditions (in office or cooler with humidity below 50%).
The breeding system in the sachets have a fungus that supply the bran mites with food. If the fungus dies, it breaks the food chain in the sachet and it will stop reproducing very quickly.

4- Cards

Biocontrol Agent Concerned : *(Encarsia formosa or Eretmocerus eremicus*)

Convenient for controlling whiteflies. Usually used for "Inoculation" with pupa of the BCAs hatching in the crop.

Application:

make sure that you respect the amount of cards that relates to the correct amount of wasps needed per area or per pot.

Hang the card in the crop or on the side of pot to make sure that the "pupa side" is protected from direct high intensity sunlight (See pictures) and watering.

Bad practice too much sunlight

Good practice protected under the bench

5- Banker plants

Biocontrol Agent Concerned :

Orius Insidiosus on Purple Flash pepper,
Dicyphus hesperus on Mullein plants,
Wasps (*Aphidius ervi, colemani*, *Aphelinus abdominalis*) on cereal

Convenient to keep a BCA population healthy and populations high at all times, even without the target pest present in the crop (yet).

It is based on releasing biocontrol agent in an habitat that provides a host, preys or food.

Banker plant is a very good example of a consistent pest management approach. Building a BCA population on guard to avoid surprise pest problems.

Application : Place the banker plants across the crop respecting the rates. During the spring season (when windows are opening and mother nature wakes up), it is interesting to introduce more aphid banker plants. This will also enhance attracting naturally occuring natural enemies such as syrphid flies, lady bug species.

6- Breeding Buckets

Biocontrol Agent Concerned : *Dalotia coriaria*

Convenient for controlling soil dwelling pest (especially pests having egg and pupae stage in the soil)

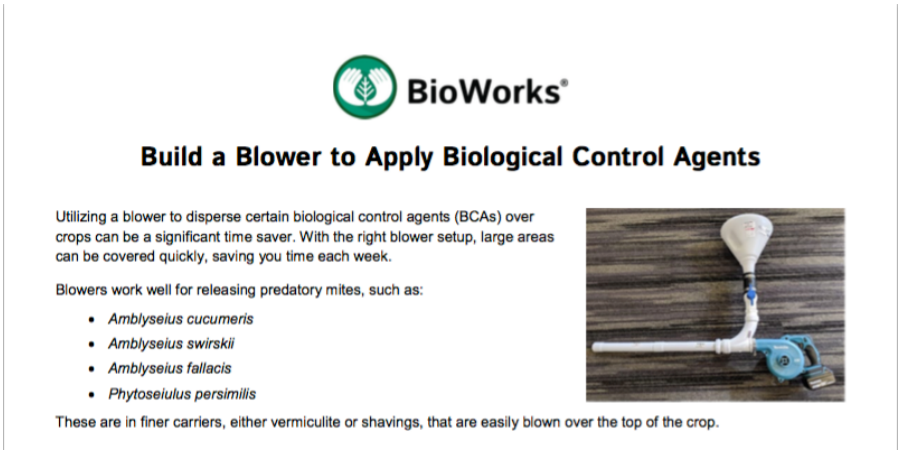
Application : The bucket is half full of moist peat moss. A weekly control is usually necessary adding water (not too much) and food to help development and breeding. You need 8 yo 10 units per acre. A good 'home' instead of buckets are the large styrofoiam containers with 2 inch hole on each site of the container.

Dalotia coriaria is very mobile and therefor can cover larger areas.

Warning : This article is not describing environment conditions (temperature, humidity, photoperiod…) and application rates necessary to succeed with the BCAs listed.

Releasing BioControl Agents is not a task that can be done by every employee. Applicators have to be trained and you don't want them to rush releasing your high value - high expectation BCA friends. Some facilities even have written Standard Operating Procedures. Even if one trained applicator might be enough, it is always interesting to train another person who can take over just in case of absence.
And again, remember that early and consistant preventive plan is cheaper than having to trigger the curative plan because of an outbreak.

Ronald Valentin from Bioworks helped for this article and generously provided DIY instructions to build your own beneficial insect blower.
Click to access Blower DIY instructions.



BioWorks®

Build a Blower to Apply Biological Control Agents

Utilizing a blower to disperse certain biological control agents (BCAs) over crops can be a significant time saver. With the right blower setup, large areas can be covered quickly, saving you time each week.

Blowers work well for releasing predatory mites, such as:

- *Amblyseius cucumeris*
- *Amblyseius swirskii*
- *Amblyseius fallacis*
- *Phytoseiulus persimilis*

These are in finer carriers, either vermiculite or shavings, that are easily blown over the top of the crop.