



PLANTPRODUCTS®



Release Instructions for Biobest® Biologicals and Bumblebees

Biological control agents are living organisms with specific requirements for release and survival. Biobest products are produced and shipped using the highest quality standards. See instructions below for best results, proper handling and utilization of products upon receipt.

General Guidelines

- Open shipped boxes and product packages immediately upon arrival.
- Inspect the product and report any issues within 24 hrs of receipt.
- Release product as soon as possible.
- Store only when absolutely necessary at the temperature indicated by the icon on the product label. Refer to the icon guide at the end of this document.
- Keep bottles and tubes laying horizontally for an even distribution of contents within the carrier and maximum air exchange.

Continue reading to find specific instructions on each available product from Plant Products.

Amblyseius-Breeding-System (ABS) - *Amblyseius cucumeris*

- Warm the tube to room temperature, keeping it in a horizontal position.
- Before applying, roll/rotate the container gently a few times, so that the mites are evenly dispersed within the carrier.
- Product comes in tubes and buckets. Apply accordingly:
 - To open the cardboard tube, turn the dial and push through the plastic cutout.
 - To open the bucket, pull on the plastic strap to remove it, and open the lid.
- Release bulk material in piles of 5 ml on top of the substrate.
5 ml = 1 tsp. | 1 L tube = 200 piles



Amblyseius-System - *Amblyseius cucumeris*

Amblyseius-Vermiculite-System (sprinkler) - *Amblyseius cucumeris*

- Warm the tube to room temperature, keeping it in a horizontal position.
- Before applying, make sure to gently roll the tube a few times, so that the mites are evenly dispersed within the carrier.
- To open the cardboard tube, turn the dial and push through the plastic cutout.
- Release bulk material preventively or curatively over crop canopy of susceptible varieties and surrounding plants.
- Apply manually (sprinkling/broadcasting) or by using a Makita blower with Nutri-App (speed level 1-2 only)
- If plant canopies are not touching or connected, make sure to apply onto every plant.
- If carrier over foliage is undesirable, use Bio-Boxes, hang them from the crop or pots and add the desired amount of product inside.



ABS Mini Sachet with Hook - *Amblyseius cucumeris*

- Hang sachets on the plant out of direct sunlight and away from overhead irrigation or direct sprays.
- Sachets are water resistant, however water can still enter through the exit hole.
- Do not puncture the sachet or make the exit hole bigger.
- Contents of the sachet will continue to breed for 4-6 weeks.
- To protect multiple plants, canopy needs to be touching. If plants are not touching, hang one sachet per plant.



ABS Mini Sachets on a Stake - *Amblyseius cucumeris*

- Using the stake, insert the sachet into the substrate of hanging baskets, propagation trays, pots or growing blocks.
- Make sure the sachet stands 1" (2.5 cm) above the substrate and is in contact with the plant.
- Do not puncture the sachet or make the exit hole bigger.
- Contents of sachet will continue to breed for 4-6 weeks.
- To protect multiple plants, canopy needs to be touching. If plants are not touching, hang one sachet per plant.



Adalia-System - *Adalia bipunctata*

- Release by opening the tray and placing it under a hot spot to allow the larvae to self disperse, or by carefully transferring each larva onto plants or into Bio-Boxes.
- Do not expose to direct sunlight.



Andersoni-System - *Amblyseius andersoni*

- Warm the tube to room temperature, keeping it in a horizontal position.
- Before applying, make sure to gently roll the tube a few times, so that the mites are evenly dispersed within the carrier.
- To open the cardboard tube, turn the dial and push through the plastic cutout.
- Release bulk material preventively or curatively over crop canopy of susceptible varieties and surrounding plants.
- Apply manually (sprinkling/broadcasting) or by using a Makita blower with Nutri-App (speed level 1-2 only)
- If plant canopies are not touching or connected, make sure to apply onto every plant.
- If carrier over foliage is undesirable, use Bio-Boxes, hang them from the crop or pots and add the desired amount of product inside.



Andersoni-Breeding-System - *Amblyseius andersoni*

- Hang sachets by the hook at the desired height in the plant, out of direct sunlight and away from overhead irrigation or direct sprays.
- Sachets are water resistant, however water can still enter through the exit hole.
- Do not puncture the sachet or make the exit hole bigger.
- Contents of sachet will continue to breed for 4-6 weeks.
- To protect multiple plants, canopy needs to be touching. If plants are not touching, hang one sachet per plant.



Aphelinus-System - *Aphelinus abdominalis*

- Open the bottle to release the product.
- In hot spots apply the equivalent of 0.5-1 tsp directly onto foliage or in Bio-Boxes.
- For preventative treatment distribute throughout the crop or around sensitive varieties.
- Apply immediately upon receipt.



Aphidius-System - *Aphidius colemani*

Aphi-Mix-System - *Aphidius colemani*, *Aphidius ervi*, *Aphidius matricariae* & *Aphidius abdominalis*

Aphidius-Mix-System - *Aphidius colemani* & *Aphidius ervi*

Ervi-System - *Aphidius ervi*

Matricariae-System - *Aphidius matricariae*

- Open the bottle to release the product.
- In hot spots apply the equivalent of 0.5-1 tsp directly onto foliage or in Bio-Boxes.
- For preventative treatment distribute throughout the crop or around sensitive varieties.
- Apply immediately upon receipt.



Aphidoletes-System - *Aphidoletes aphidimyza*

- Release immediately! Adults live only for a few days.
- To open the cardboard tube, turn the dial and push through the plastic cutout.
- Apply large piles onto moist growing media containing about 250 pupae per release point.



Atheta-System - *Dalotia coriaria*

- Warm the tube to room temperature, keeping it in a horizontal position.
- Before applying, gently roll or rotate the container a few times, so that the predators are evenly dispersed within the carrier.
- Product comes in tubes and buckets, apply accordingly:
 - To open the cardboard tube, turn the dial and push through the plastic cutout.
 - To open the bucket, pull on the plastic strap to remove it and open the lid.
- Apply a heaping tablespoon or larger onto growing medium. It does not need to be applied to each plant or pot because adults fly.
- Divide 1 package of 1000 into 25-50 piles



Californicus-System - *Amblyseius californicus*

- Warm the tube to room temperature, keeping it in a horizontal position.
- Before applying, gently roll or rotate the container a few times, so that the mites are evenly dispersed within the carrier.
- Product comes in tubes and buckets, apply accordingly:
 - To open the cardboard tube, turn the dial and push through the plastic cutout.
 - To open the bucket, pull on the plastic strap to remove it and open the lid.
- Apply manually (sprinkling/broadcasting) or by using a Makita blower with Nutri-App (speed level 1-2 only)
- Release bulk material evenly over the canopy of the plants to be protected or treated.
- If plant canopies are not touching or connected, make sure to apply onto every plant.
- If carrier over foliage is undesirable, use Bio-Boxes, hang them from the crop or pots and add the desired amount of product inside.



Californicus-Breeding-System - *Amblyseius californicus*

- Hang sachets by the hook at the desired height in the plant, out of direct sunlight and away from head irrigation or direct sprays.
- Sachets are water resistant, however water can still enter through the exit hole.
- Do not puncture the sachet or make the exit hole bigger.
- Contents of sachet will continue to breed for 4-6 weeks.
- To protect multiple plants, canopy needs to be touching. If plants are not touching, hang one sachet per plant.



Chrysopa-E-System - *Chrysopa rufilabris* eggs

- Add to Bio-Boxes and hang boxes from affected plants (best method). If canopy is overlapping, the eggs can be directly sprinkled onto canopy using a shaker lid or mixed with predatory mites in sawdust or bran and applied with a Makita blower and Nutri-App. Hatch rates are best if eggs are applied to foliage or Bio-Boxes rather than the floor or potting media.
- Hatch rate will decrease with storage.



Chrysopa-System - *Chrysopa rufilabris* larvae

- Release immediately! Larvae are cannibalistic.
- Release bulk material over the canopy or in hot spots at the base of the plants or in Bio-Boxes.
- Nutrimac™ or Nutri-cards can be introduced as a food supplement. (See food supplement instructions.)



Cryptolaemus-System - *Cryptolaemus montrouzieri*

- This product comes formulated as **larvae** or **adults**.
- Release **larvae** onto infested plants by carefully transferring them alone or with the shredded paper carrier onto plants or into Bio-Boxes.
- Release **adults** on hot spots preferably in the evening and if possible cover the plants with a breathable fabric to keep the beetles in.



Dacnusa-System - *Dacnusa sibirica*

- Sprinkle onto foliage in affected areas or sensitive varieties.
- Adults fly and will disperse on their own.



Degenerans-System - *Amblyseius degenerans*

- Sprinkle onto foliage at a minimum of one release point per row. For best results have 250 release points per hectare (100 per acre) in vegetable crops. In ornamentals, apply by gently tapping the contents out onto the affected areas or sensitive crops.
- Nutrimite™ can be introduced as a food supplement for increased reproduction. (See food supplement instructions.)



Delphastus-System - *Delphastus catalinae*

- Open the vial to release adults.
- With low whitefly infestations apply on leaves over the entire crop.
- In hot spots apply over affected canopy or in Bio-Boxes.
- For best results use in combination with whitefly parasitoids. (See Encarsia-System and Eretmocerus-System)



Diglyphus-System - *Diglyphus isaea*

- Open the vial and gently tap onto foliage in affected areas or sensitive varieties.
- Adults fly and will disperse on their own.



Encarsia-System - *Encarsia formosa*

Eretmocerus-System - *Eretmocerus eremicus*

Eretmix-System - *Encarsia formosa* & *Eretmocerus eremicus*

Poinsettia-Mix-E-System - *Encarsia formosa* & *Eretmocerus eremicus*

- Fold the cards back and forth (2-3 times) on the vertical perforation.
- Tear the cards apart carefully to avoid crushing the exposed pupae. The pupae are attached to the circle on the surface of the card.
- Hang cards on plants or from the rim of pots with the pupae facing towards the plant, out of direct sunlight and sprays.
- Distribute the cards evenly throughout the area you wish to treat.



Feltiella-System - *Feltiella acarisuga*

- Remove the lid and place on top, covering 1/2 of the container.
- Adults will mate and fly out dispersing themselves.
- Place the tray at the base of a heavily affected plant out of direct sunlight.



Hypoaspis-System - *Stratiolaelaps scimitus*

- Warm the tube to room temperature, keeping it in a horizontal position.
- Before applying, gently roll or rotate the container a few times, so that the mites are evenly dispersed within the carrier.
- Product comes in tubes and buckets, apply accordingly:
 - To open the cardboard tube, turn the dial and push through the plastic cutout.
 - To open the bucket, pull on the plastic strap to remove it and open the lid.
- Broadcast material or apply in 1 tsp piles onto the ground, growing medium or pots you wish to treat.
- Hypoaspis does not fly, so spreading them out evenly is key.
- Hypoaspis can survive without pests for up to 7 weeks.



Insidiosus-System - *Orius insidiosus*

- Warm the container to room temperature.
- Before applying, gently roll or rotate the container a few times, so that the beneficials are evenly dispersed within the carrier.
- Distribute evenly into large piles throughout the greenhouse on flat leaves, fruits, slabs or Bio-Boxes. Do not disturb for a few days.
- When establishing a population, release when daylight levels are longer than 11.5 hours.
- Nutrimac™ or Nutri-cards can be introduced as a food supplement for increased reproduction, longevity and preying activity. (See food supplement instructions.)



Phytoseiulus-System - *Phytoseiulus persimilis*

- Warm the container to room temperature, keeping it in a horizontal position.
- Before applying, gently roll or rotate the container a few times, so that the mites are evenly dispersed within the carrier.
- Release material preventively or curatively over the canopy of the plants or area you wish to treat (susceptible varieties, affected and surrounding plants). Repeat at every release point or use a Makita blower with Nutri-App (speed 1-2 only).
- If plant canopies are not touching or connected, make sure to apply onto every plant.
- If carrier over foliage is undesirable, use Bio-Boxes. Hang them from the crop or pots and add the desired amount of product inside.



Swirskii-System (sprinkler) - *Amblyseius swirskii*

- Warm the tube to room temperature, keeping it in a horizontal position.
- Before applying, gently roll or rotate the container a few times, so that the mites are evenly dispersed within the carrier.
- Product comes in tubes and buckets, apply accordingly:
 - To open the cardboard tube, turn the dial and push through the plastic cutout.
 - To open the bucket, pull on the plastic strap to remove it and open the lid.
- Release bulk material preventively or curatively over crop canopy of susceptible varieties and surrounding plants.
- Apply manually (sprinkling/broadcasting) or by using a Makita blower with Nutri-App (speed level 1-2 only)
- If plant canopies are not touching or connected, make sure to apply onto every plant.
- If carrier over foliage is undesirable, use Bio-Boxes, hang them from the crop or pots and add the desired amount of product inside.
- Nutrimite™ can be introduced as a food supplement for increased reproduction. (See food supplement instructions.)



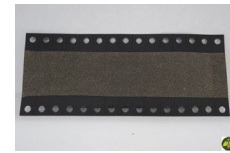
Swirskii-Breeding-System - *Amblyseius swirskii*

- Hang sachets by the hook at the desired height in the plant, out of direct sunlight and away from overhead irrigation or direct sprays.
- Sachets are water resistant, however water can still enter through the exit hole.
- Do not puncture the sachet or make the exit hole bigger.
- Contents of sachet will continue to breed for 4-6 weeks.
- To protect multiple plants, canopy needs to be touching. If plants are not touching, hang one sachet per plant.
- Nutrimite™ can be introduced as a food supplement for increased reproduction. (See food supplement instructions.)



T-Brassicae-System - *Trichogramma brassicae*

- Using scissors, cut cards on the perforated lines and use the built in hooks to hang from plants or from the rim of pots. Make sure pupae are facing towards the plant, out of direct sunlight and sprays.
- Timing for release is critical to ensure host eggs are available for parasitism.

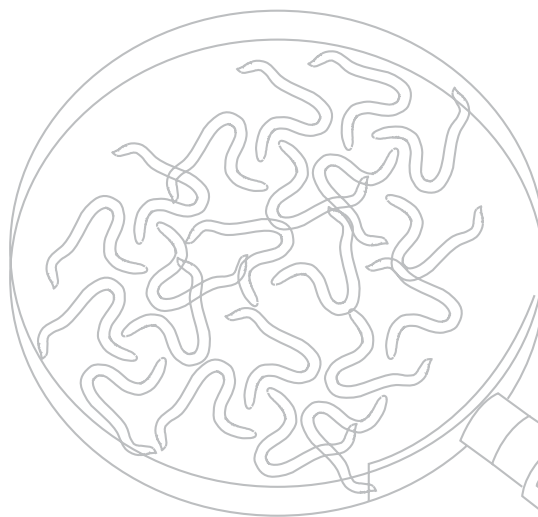


Nematodes

- Apply as a spray, drench or dip at the rates recommended by your Plant Products advisor.
- UV sunlight kills nematodes: always apply at cloudy or low light level times of day. If using artificial lights, turn them off before the application and turn them back at least 2 hrs after application.
- Maintain agitation to prevent nematodes from settling to the bottom of the tank.
- Use bubbler for maximum aeration and thorough suspension of nematodes in stock solution.
- Do not put through centrifugal pumps.
- Use filters wider than 50 mesh and nozzles larger 0.5 mm.
- Use a spray pressure lower than 60 psi.
- Soil temperature should be between 50-86°F (10-30°C) for nematodes to be active.
- Always use full packages.



*For all other inquiries please refer to the instructions provided with your order or contact your Plant Products advisor.



Food supplements: Nutrimite™, Nutri-cards, Nutrimac™

Nutrimite™

- Apply over the canopy using a Bio-Bobby or a Makita blower. (See information below.)
- Set the Makita blower to level 1, 2 or 3 and calibrate your pace to apply the product evenly over the required area. (Cornstarch can be added to dilute product and ensure proper rate is applied.) Makita will cover up to 4 m wide at maximum speed.
- Nutrimite™ quality is optimal on the crop for up to 2 weeks.
- Store in a freezer until the expiry date.
- Apply biweekly at full rate or weekly at 1/2 rate in crops with rapid growth such as cucumbers, ornamentals or frequently overhead irrigated/sprayed crops.
- This food supplement supports *Swirskii*, *Degenerans* and to a lesser extent, *Andersoni*, *Californicus* and *A. Cucumeris*.



Nutri-cards - Ephestia kuehniella eggs on cards

- Introduce weekly in and around the release points of beneficials.
- Fold the cards back and forth (2 - 3 times) on the vertical perforation.
- Hang on crop via the built in hook.
- Apply directly on crop or banker plants.
- Store unused cards for future use in the freezer.
- This food supplement supports Insidiosus-System, Chrysopa-System and Adalia-System.



Nutrimac™ - Bulk Ephestia kuehniella eggs

- Introduce weekly.
- Add to Bio-Boxes or apply by gently tapping on flat leaves in and around release points of beneficials.
- Keep leftover product in the freezer for future use.
- This food supplement supports Insidiosus-System, Chrysopa-System and Adalia-System.



Application Equipment for Food Supplements

Nutri-App in combination with a Makita Blower

- Nutri-App is an applicator tool that can be attached to a Makita blower. (We recommend the Makita DUB182Z)
- Distribute Nutrimite™ quickly, easily and evenly throughout your crop.
- 500 gram Nutrimite™ bottle can be directly attached to the device. The bottle can be turned in different positions to ensure it is completely emptied and nothing is wasted.
- Nutri-App can also be used to disperse beneficials in loose material such as bran, vermiculite and sawdust.
- If using to disperse beneficials DO NOT exceed speed #2. This will kill or break the legs of the mites!



Supporting products

Bio-Box

Helps beneficials stay in the crop instead of falling down during application. Prevents the carrier from attaching and/or decaying on crop foliage (ornamentals/cannabis). Bio-Box prevents beneficials and the carrier from becoming moist in cases where they need to stay dry for best performance. (Aphidius, Orius, etc...)



- Unfold cardboard box by applying pressure in the center of the box until the box adopts a cubic shape.
- Hang Bio-Box on plant/pots or attach to support systems.
- Add the recommended amount of beneficials inside the box.

Notes

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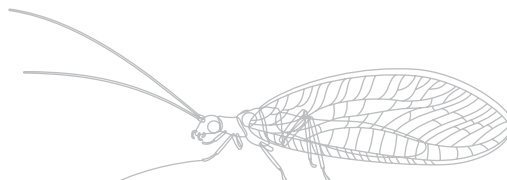
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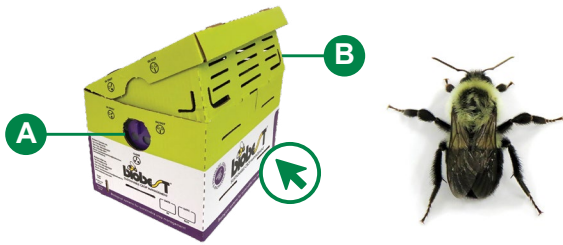
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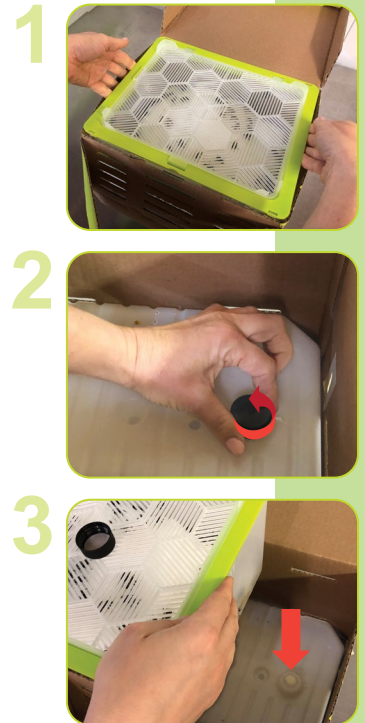
Pollination

Biobest® Bumblebee Hives

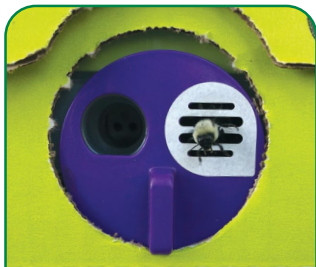


1. Open the cardboard box and carefully remove the hive. Be careful not to open the screened lid. To avoid stings or damage to the hive, do not place your fingers directly on the vents or push your thumbs down on the lid.
2. **Unscrew and remove the cap of the sugar water container.** Do not push or squeeze the wick. The wick is where the bumblebees access the sugar water.
3. Place the hive back into the box so that the hive makes good contact with the wick.
4. Close the lid of the cardboard box.
5. Place the hive in the appropriate location in the greenhouse.
6. Turn the rotating dial to the opened hive position. (A) (See bee lock instructions.)
7. When temperatures rise above 79°F (26°C) open the hive ventilation system. (B)

For all other inquiries please refer to the instructions provided with your order or contact your Plant Products advisor.



Bee Lock Instructions Biobest Bumblebee Hives



To open the hive, turn the bee lock to this position. The bees will chew through the sticker.



To collect the bumblebees, turn the bee lock to this position.



To close the hive, turn the bee lock to this position.



Do not push back or pull out cotton coming out of the flight opening. This is a sign that the bumblebees are very active.

Biobest® 4-Pak™

As part of our commitment to stewardship best practices, queen excluders have been added to every outdoor 4-Pak hive box. Queen excluders prevent Biobest queens from exiting and wild queens from entering the brood box.

1. Upon arrival, inspect 4-Pak for damage that may have occurred during transit.
2. Place in the designated location of the field, preferably on a pallet to keep 4-Pak from standing water.
3. To open, turn the rotating dial (bee lock) so that the Bee-Safe sticker is over the in/out position.
4. 24 hours after opening, check the Bee-Safe sticker on the front of the hive to see if bumblebees have exited the 4-Pak. If not contact your Plant Products advisor.



For all other inquiries please refer to the instructions provided with your order or contact your Plant Products advisor.

Bee Lock Instructions Biobest 4-Pak



Bee-Safe Sticker

This sticker is made from paper and a food grade adhesive. It is placed over the opening of the brood box to slow the exit of the bees on the initial opening of the hive to help prevent stings. The bumblebees will chew through the sticker within 24 hours.



To open the hive, turn the bee lock to this position.



To close the hive and contain the bumblebees, turn the bee lock at dusk, to this position.

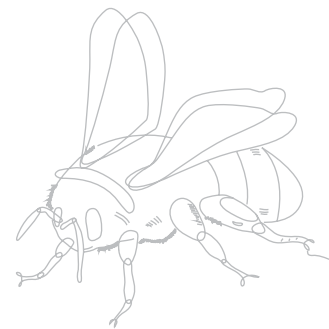
In case of a sting:

Most people have a local reaction if stung by a bumblebee, resulting in redness and itching in the vicinity of the sting. If stung where the skin is looser, such as eyelids, the swelling can be more pronounced. Local reactions normally disappear quickly but can sometimes last a couple of days.

In rare cases of an allergic reaction resulting in difficulty breathing, swelling of the throat and tongue, nausea, vomiting or diarrhea, dizziness or fainting, seek emergency help immediately.

For more information refer to the Plant Products website:

https://www.plantproducts.com/us/images/Bee_sting_advice.2023.pdf

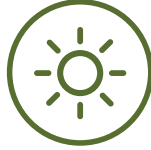


ICONGUIDE

CONDITIONS



Do not expose to sunlight



Place in the sun



Do not place in the rain



Protect from rain

STORAGE



Store at X °C/°F



Store between X and Y °C/°F



Always store horizontally

USE



Sprinkle on plant material



Sprinkle on substrate



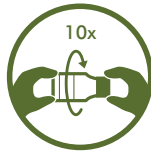
Spread in Bio-Box



Hang card in crop



Open pot and place in crop



Gently turn bottle 10 times before use



Spread product on soil/substrate



Drone application

HIVES



Keep level. Do not place hives on the ground



Wait for one hour before opening



This side up



Evenly spread the product in the tray



Caution! Stings



Check BiobeST side effect manual



Open ventilation system