



Greenhouse Pest Message August 19, 2022

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Highlights of the Greenhouse Biological Control Conference, August 16, 2022

Update on Banker Plants Ron Valentin, Anatis BioProtection

What is the idea of sustainable holistic approach?
How did this get started?

- Sachets of *Amblyseius cucumeris* vs broadcasting
- Started in 1989 → single stem flower flask
- 'ROI' sachets vs broadcasting:
 - Bio-control is a proactive approach

What is in the sachets:

- Bran
- Fungus
- Predatory mites
- Bran mites
- Ratio 1 :10

Culture

Average return over lifetime = 10x which means a sachet starting at 250 mites will produce approx. 2500 mites

ANATIS BIOPROTECTION

Banker plants are a systems approach that are used to aid in the establishment, development, and dispersal of biological control agents (BCAs). They support BCAs and increase their effectiveness (if they are properly maintained!). Bankers are not a stand-alone system, but part of a holistic approach. Some types that Ronald discussed were:

- Aphid banker plant system supporting *Aphidius colemani*
 - Oats, Barley, Rye, Wheat
- Pepper banker plant system supporting *Orius insidiosus*
 - *Capsicum annuum* – 'Purple Flash'
- Mullein banker plant system supporting *Dicyphus hesperus*
 - *Verbascum thapsus*, *Verbascum densiflorum*
- Allysum banker plant system supporting multiple species of BCAs
 - *Lobularia maritima* var. 'Snow Princess'
 - *Lobularia maritima* var. 'Clear Crystal White'

Be sure not to apply either insecticides or fungicides to your banker plants! Aphid banker plants work best for smaller aphids (such as green peach and melon aphids) and not larger aphids such as foxglove aphids. In the summer months, you may see [hyperparasitoids](#).

Remove all aphid banker plants in the fall so you do not carry hyper parasites into the winter!

When producing pepper banker plants, it takes 10 to 12 weeks to grow the ornamental peppers before they start producing flowers, providing pollen, needed as a food source for *Orius*. Start pepper seed in early December for late February banker plant introductions. Use *cucumeris* sachets in peppers because it takes time for *Orius* to get established. Use a 2 to 3 feet wide white board to look for bright orange *Orius* nymphs after 3 to 4 weeks to see that they are reproducing.

Mullein banker plants are used to support *Dicyphus*, a generalist predator that feeds upon whiteflies, thrips, moth eggs and two spotted spider mites. Planning is needed, for you need to start mullein seed 4 to 5 months before your crops are planted. Mullein banker plants can be used in greenhouse strawberry, tomato, and spring ornamental crops. *Dicyphus* is active at lower temperatures (54 F) and does not have a diapause phase.

Lobularia banker plants can be used to support *Orius*, but also support syrphid flies, lady bugs, lacewings, AND parasitic wasps AND pollinators. Some growers use combination planters with lobularia and ornamental pepper plants.

Releasing Natural Enemies Suzanne Wainwright Evans, Buglady Consulting



Suzanne discussed the importance of preparing for the arrival of your biological control agents. Check the temperature of inside of the shipping container with an infrared thermometer and check the expiration dates on the packages.

To evaluate quality, see **Grower Guide: Quality Assurance of Biocontrol Products** compiled by Dr. Rose Buitenhuis at:

<https://www.vinelandresearch.com/wp-content/uploads/2020/02/Grower-Guide.pdf>.

You should prioritize the release order of the bcas. Release natural enemies that are shipped without a food source first, for example, *persimilis*, and *californicus*. Then release those with some food sources such as *cucumeris* and *swirksii*. Roll bottles in a horizontal position to reincorporate natural enemies into the carrier. Nipple tops are helpful for releasing *persimilis* on foliage plants such as palms and are available from Beneficial Insectary.

To save on labor costs, some growers are purchasing blowers from Biobest or Koppert or using modified leaf blowers. Remove yellow sticky cards before using the blowers!

Drones are being used, especially outdoors, to release beneficials.

<https://www.parabug.solutions/>

Tips on How to Effectively Integrate Biological Controls and Chemical Controls, Elwood Roberts, Plant Products



Elwood suggested using bcas first and then doing a chemical correction, if needed. It may be an outbreak of just one pest, but it is never just about one pest. Spot sprays can be efficient if your bcas have established.

Consult Pesticide Side Effect Databases

(1) Koppert's online interactive database: <https://www.koppertus.com/side-effects-database/>

(2) Biobest: <https://www.biobestgroup.com/en/side-effect-manual>

(3) BASF: <https://betterplants.basf.us/> (Nemasys Chemical Compatibility Guide). <https://betterplants.basf.us/content/dam/cxm/agriculture/better-plants/united-states/english/products/nemasys-beneficial-nematodes/nemasys-chemical-compatibility-guide.pdf>

(4) Bioworks: BCA's for use with Bioworks Products
https://www.bioworksinc.com/wp-content/uploads/20200303_BCA_Compat.pdf

Enhancing the Use of Biological Fungicides in a Biologically Based IPM Program, Michael Brownbridge, Bioworks



The development of resistance, market trends and restrictive REI's have helped fueled more grower interest in biopesticides. However, there is a perception that they are less effective. Proper timing, and placement are important to increase their effectiveness. Biological fungicides are EPA registered fungicides that work with multiple modes of action. A holistic approach is needed to be successful.

Reducing the risk of disease can increase biopesticide efficacy. Remember your disease triangle and use prevention and proper sanitation practices to reduce disease pressure. Avoid abiotic stresses such as under and overwatering, under and overfertilization.

Most biofungicides work by contact so proper coverage is needed. When applying microbials, spray to glisten. Smaller droplet sizes such as when using ULV, will give you better spray coverage. Place water sensitive cards throughout the crop, especially under the leaves. Remove the cards after spraying to check them.

To prevent root diseases, Rootshield Plus can be applied at seeding, sticking or transplant. Rootshield Plus increases abiotic stress resistance, helping to reduce shrinkage in retail and shipping.

For compatibility of biopesticides when tank mixing, see the [Bioworks](#) website.

Grower Case Studies – What’s Working, Suzanne Wainwright Evans

There are commercially available BCAs that can be successful against fungus gnats, aphids (GPA), western flower thrips, onion thrips, whiteflies, two spotted spider mites and broad mites.

Because plant material may be introduced with resistant pests already present, (as well as pesticide residues), using dips can help reduce pest pressure before releasing bcas.

See: Utilizing Dips: Clean Up Incoming Plant Material from Bioworks
https://bioworksinc.com/wp-content/uploads/20201222_UtilizingDips.pdf

Conservation of natural enemies is important and most natural enemies love plant diversity not monocultures. Some growers use of banker plant islands in outdoor garden mum production to help with the establishment of natural enemies reducing pest problems. Island beds or beneficial gardens with sunflowers, gomphrena, yarrow and other perennials to attract natural enemies can be used with releases of lacewing eggs, and *Orius*. Predatory mites are used in garden mum propagation for spider mites. Speaking of spider mites, the use of *cucumeris* sachets in New Guinea Impatiens hanging baskets for broad mites also suppresses spider mites.

Commitment is needed to make banker plant systems work. Fava beans supporting pea aphids for *A. ervi* is another banker system. Pea aphids tend to be “nervous” and drop off the plant when touched, so the banker plants shouldn’t be moved around too much. It is best to place the fava beans where you want them to be, and then place the pea aphids on them. To start new bankers, gently place the younger plants next to the older banker plants, so the pea aphids will move to the younger plant.

Western flower thrips notorious ability to develop resistance has driven many biological control programs. But, do you know what thrips species you are actually dealing with? See Simple Key to Important Thrips Pests of Canadian Greenhouses <https://onfloriculture.com/wp-content/uploads/2018/10/key-to-important-thrips-pests-of-ontario-greenhouses-2018.pdf>

From: On Floriculture Blog: The Latest Floriculture IPM Information from Sarah Jandricic, Greenhouse Floriculture IPM Specialist, OMAFRA
<https://onfloriculture.wordpress.com/>

If you are just starting or thinking about starting a biological control program, Suzanne, Ronald, and John Sanderson wrote this series for GrowerTalks:

- Sanderson, J. S. Wainwright-Evans, and R. Valentin. Best Practices for Biocontrols, Part 1. Grower Talks. 84 (10):40-42. February 2021.
<https://www.growertalks.com/Article/?articleid=25071>
- Sanderson, J. S. Wainwright-Evans, and R. Valentin. 2021. Release the Beasts., Part 2. Grower Talks. 84 (11): 64-66. March 2021.
<https://www.growertalks.com/Article/?srch=1&articleID=25126&highlight=sanderson>
- Sanderson, J., S. Wainwright Evans, and R. Valentin. 2021. Best Practices for Biocontrols, Part 3. GrowerTalks. 84 (12) 60-64. April 2021.
<https://www.growertalks.com/Article/?srch=1&articleID=25175&highlight=sanderson>
- Sanderson, J., S. Wainwright-Evans, and R. Valentin. 2021. Best Practices for Biocontrols, Part 4. GrowerTalks. 85 (1):62-66. May 2021.
<https://www.growertalks.com/Article/?srch=1&articleID=25217&highlight=sanderson>
- Sanderson, J., S. Wainwright-Evans, and R. Valentin. 2021. Best Practices for Biocontrols, Part 5. GrowerTalks. June 2021.
issue: <https://www.growertalks.com/Article/?articleid=25255>

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