



Integrated Pest Management Program

Department of Plant Science and Landscape Architecture
UConn Extension

Highlights from the 2019 Greenhouse Biological Control Conference Leanne Pundt, Extension Educator, UConn Extension

Links to available presentations are listed below plus other helpful links. You can also go to the UConn Greenhouse IPM website: http://ipm.uconn.edu/pa_greenhouse/ and look under educational programs:

Strategies for Success with Biological Controls: Planning and Forecasting by Ron Valentin, Director of Technical Business, Bioworks



Figure 1: Ron Valentin, Bioworks. Photo by L. Pundt

The demand for biological control agents is increasing, so growers need to be sure they have a consistent supply. Quality on Time and in Full (QUOTOIF) is critical. Starting too late is the number one reason biological control programs fail. You should be planning now for next spring. Start biologicals in propagation or order liners from growers who use biological controls.

Communication between the grower and BCA supplier is critical, as some natural enemies are reared in the greenhouse on host plants, so there is a 6 to 8 week lag time. Sachets with *cucumeris* are reared in a climate-controlled room. When you receive the sachets, store them in the greenhouse not in your office. Open up the shipping box so there is not a buildup of carbon dioxide. The release of *cucumeris* from the sachets peaks at about 3 to 4 weeks (at 68° F).

Check the temperature of the shipping box on arrival! Extremes (less than 32 °F) in the winter or above 100° F in the summer are serious issues and you should let your supplier know.

For more: Why You Should Plan and Forecast to Prevent Greenhouse Biocontrol Supply Shortages article from Greenhouse Grower by Ron Valentin

<https://www.greenhousegrower.com/production/why-you-should-plan-and-forecast-to->

[prevent-greenhouse-biocontrol-supply-shortages/](#)

Link to PDF file of presentation

<http://ipm.uconn.edu/documents/raw2/1511/ValentinCT%20meeting%20June%202019th%202019.pdf>

Proper Identification of Aphids, Thrips and Other Troublesome Pests, Suzanne Wainwright-Evans, Buglady Consulting <http://www.bugladyconsulting.com/>



Figure 2: Suzanne Wainwright-Evans, Buglady Consulting. Photo by L. Pundt

Aphid Identification

There are four major species of aphids affecting ornamentals: green peach aphid, cotton or melon aphid, potato aphid and foxglove aphid. Proper identification is needed to select the appropriate biological control agent.

The rice root aphid (*Rhopalosiphum abdominalis*) is a major aphid pest in cannabis/hemp. It can also be found on ornamentals such *Juncus* or rush grasses. Always check your

roots! <https://webdoc.agsci.colostate.edu/hempinsects/PDFs/Rice%20root%20aphid%20with%20photos.pdf>

In greenhouses, aphids give birth to living young. However, the cannabis or hemp aphid, (*Phorodon cannabis*) recognized by its “devil horns”, lays eggs in greenhouses.

Do not use color to identify aphids; for example, green peach aphids are not always green for there are pink or red forms. There can also be different color forms of cotton or melon aphid and potato aphids within a colony.

Use a microscope (such as a Dino-lite microscope) and keys to look at identifying characteristics.

For

more: https://cals.arizona.edu/crops/vegetables/advisories/docs/Aphids_Vegetables.pdf

Dino-lite Microscope <http://www.dino-lite.com/>

Aphids are not fungus gnats! Look at pattern of wing venation to tell the difference.
Identifying Some Pest and Beneficial Insects on Your Sticky Cards

<http://ipm.uconn.edu/documents/raw2/888/2019ticky%20Card%20PhotosIPM2.pdf>

Thrips Identification Not all biocontrol works for all species so proper identification is important. Are they western flower thrips, onion thrips, *Echinothrips*, chilli thrips, tobacco, banded or greenhouse thrips?

Echinothrips americanus pupate on leaf undersides, so do not rely on predatory mites but use BotaniGard WP instead.

In a recent survey, of Ontario floriculture greenhouses, 33% were onion thrips, and 65% western flower thrips and 1% *Echinothrips*. Management strategies vary depending upon the species.

Simple Key to Important Thrips Pests of Canadian Greenhouses

<https://onfloriculture.files.wordpress.com/2018/10/key-to-important-thrips-pests-of-ontario-greenhouses-2018.pdf>

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

Pest Thrips of United States Field Identification Guide:

https://www.ncipmc.org/action/chili_thrips_deck.pdf

Do not confuse springtails with thrips. Look for the furcula appendage that helps the springtail jump. Springtails may be more common now because of use of more microbials in growing media.

Not all thrips are pests; six-spotted thrips (*Scolothrips sexmaculatus*) is predatory on spider mites.

Biological Controls at DS Cole, Chris Schlegel, Head Grower



Figure 3: Chris Schlegel, DS Cole, Photo by L. Pundt

With 5 acres of greenhouses, DS Cole roots over 10 million cuttings each year. They apply nematodes to most liners using a high volume sprayer used at low pressure with filter removed. Viability of the nematodes is checked with each application at the spray nozzle. They use cucumeris on most liners and many finished crops for thrips and spider mites. However, drenching against aphids is still needed on aphid prone crops such as Calibrachoa, fuchsia and combination hanging baskets. For long-term crops and stock plants, they replace the mini-sachets about every two months. Thrips were a major pest of fall ornamental peppers when they were grown inside. But, now they are finished outdoors, Orius and other natural predators keep thrips levels low. For poinsettias, Eretmocerus cards are hanged on support rings or sticky cardholders. They collect their own cattail pollen as a supplemental food source for *swirskii*.

Link to PDF file of

presentation: <http://ipm.uconn.edu/documents/raw2/1514/DSColeBiologicalcontrols.pdf>

Supplemental Foods and their Applications, Steven Arthurs, BioBee USA



Figure 4: Steven Arthurs, BioBee, Photo by L. Pundt

Supplemental foods can be used to support early establishment of biological control agents, increase their longevity and reproduction and promote the effectiveness of biological controls. Types of supplemental foods include banker plants, pollen, *Ephestia* (sterile eggs of flour moth) and artemia (cysts of the brine shrimp). A pollen gun can be used to distribute cattail pollen.

Consider application method for releases of *persimilis* (not all bottles are the same). In Florida, they place *persimilis* in palm leaf axils every two weeks. See his presentation for studies assessing the effects of blower speed on predatory mites. Research ongoing on the

use of drones to release biological control agents. Drones would save on labor costs but you lose accuracy.

Link to PDF file of

presentation: <http://ipm.uconn.edu/documents/raw2/1512/Advanced%20biocontrols%20supplemental%20feeding%20and%20application%20strategies.pdf>

Grower Case Studies: What's Working, Suzanne Wainwright Evans, Buglady Consulting <http://www.bugladyconsulting.com/>

Start using biologicals in propagation when the plants are small and spaced pot to pot, so it is easy to release biological control agents. Use beneficial nematodes, cucumeris and BotaniGard WP for fungus gnats and western flower thrips. Some IGR's may affect egg laying of predatory mites. Mini-sachets of cucumeris are used in hanging baskets for both thrips and broad mite susceptible crops such as New Guinea impatiens. Broadcast cucumeris first and then place mini-sachets. Sachets should last 5 to 6 weeks. Outdoors, group pepper banker plants into "islands" for large areas of outdoor garden mum production. Use both banker plants and floral resource plants. Scouts need to be training to identify naturally occurring beneficials. For example, syrphid or flower fly larvae are not pest caterpillars!

Go to Am Hort Plug and Cutting Conference
<https://www.americanhort.org/page/Plug2019>
for Production Tour of Metrolina Greenhouses

The Future of Biologicals

Marketing is needed to promote our use of biological controls.
Nematodes to the space station <https://astronematode.com/>

Parabug drones for predatory mites, lacewings <https://www.parabug.solutions/>



Figure 5: Using Sieves to Check Quality of *Amblyseius mites*. Photo by L. Pundt

Using sieves to check quality of *Amblyseius* Mites:

Take several sachets or scoop of bulk product and run test through sieve
Sieve tests (1 mm) out most of the bran (or vermiculite)
Ratio between predatory mite and bran mite should be 1:10
You want to see different life stages of the mite

Where to Purchase Sieves: Amazon or Cole-Parmer directly

[Cole-Parmer 3" Diameter Stainless Steel Full Height Sieve Pan](#)

[Cole-Parmer 3"-Diameter Sieve, Full Height Stainless Steel, No. 18 \(1.00mm\)](#)

[Cole-Parmer 3"-Diameter Sieve, Full Height Stainless Steel, No. 25 \(710 \$\mu\$ \)](#)

[Cole-Parmer 3" Diameter Stainless Steel Sieve Cover](#)

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