

## DEMONSTRATION SITE: DISEASE & PEST CONTROL 2018

### Ecology in action for Dahlia production: Luring cucumber beetles and their predators

#### Farmer-researcher

Jessica Gale, Sweet Gale Gardens

This document outlines the steps that Jessica will follow to execute her demonstration site, *Ecology in action for Dahlia production: Luring cucumber beetles and their predators*, including design, execution, data collection and data sharing. It also serves as a Memorandum of Understanding between Jessica and EFAO.

#### Background

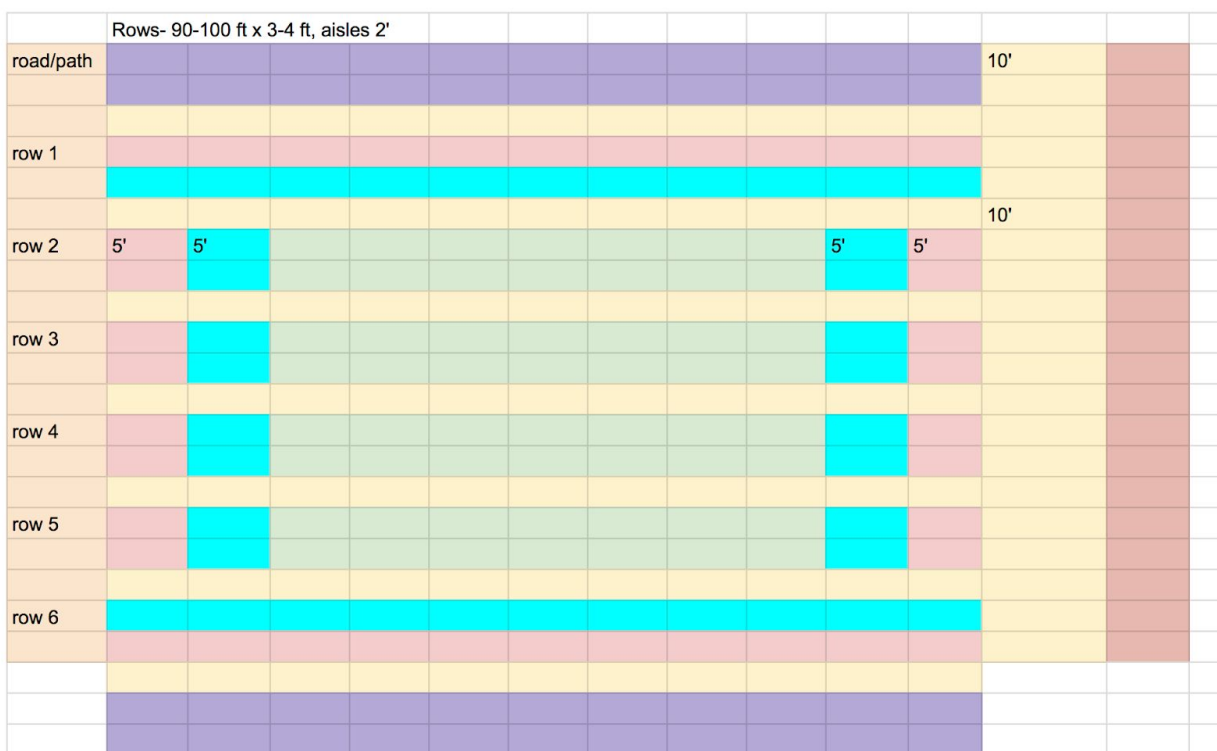
Dahlias are one of the top 5 crops of small scale flower farmers focused on local markets. Dahlias, however, are ephemeral crops that can be delicate and difficult to ship. They also face higher pest pressure than other flower crops, including from common agricultural pests like tarnished plant bug, spotted cucumber beetle and southern corn rootworm. The cucumber beetle is particularly damaging because many field grown dahlias bloom when cucurbit crops (the insect's preference) are less enticing to the pests.

One method to manage pest pressure is with trap crops. Trap crops lure the spotted cucumber beetles to them, after which the beetles are killed on or near the trap crop. There is very little known about how to take advantage of the beetles' natural enemies, including the tachnid fly. This fly predaes on cucumber beetles, tarnish plant bug and other agricultural pests. It regularly eats pollen and nectar from flowers and deposits its eggs near the head of prey or inserts them internally. As the eggs hatch, the host provides food to growing larva.

In her exploration of ecological control for cucumber beetles and tarnish plant bug, Jessica seeks to create a balance: provide an alternative trap crop for the beetles while also attracting their predators with pollen- and nectar-rich crops (phacelia and alyssum). By providing a supply of beneficial blooms, predators will hopefully be attracted to the site prior to beetle arrival. Then a constant selection of blue hubbard seedlings and phacelia blooms will continue as the dahlias bloom, providing additional food sources throughout the dahlia blooming cycle.

#### Demonstration Set-up & Timing for Plantings

Legend
Dahlias, with straw mulch and alyssum interplanted
Cover crop
Squash
Cover crop of winter wheat
Other flower crops
General cover cropped field



Trap available w 32-40																				
Insectary flowering by w 27																				
Week #	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Phacelia-n/s edges of plot	[Green]						[Green]													
Phacelia-e/w beds of plot	[Green]						[Green]													
2 week transplants & seed hubbard squash												[Orange]								

### Methods & Measurements

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Starting 2 weeks after first blooms, and every week thereafter for 6-8 weeks, Jessica will measure:

1. Dahlia quality at the monitoring sites
2. Insect pressure at monitoring sites on her farm
3. Overall harvest of sellable dahlias
4. Insect pressure at monitoring sites on an neighbouring dahlia farm

Specifically, on Mondays, Jessica will:

- Harvest 5 stems at the monitoring points. She will categorize the blooms as:
  - Sellable
  - Not sellable
  - Not open enough to call
- Place sticky traps at the monitoring sites, one per site.
  - Before Jessica begins, she will make a map of the locations with a number or letter code for each location.
  - **Placement:**
    - Label all sticky cards with date placed and location
    - Place 3 traps at 5, 15, 30' from the trap crops
- Take photos and notes
- Then go through and cut the whole patch and harvest everything
  - Count total sellable and and total waste

On Tuesdays, Jessica will:

- Harvest any other ready stems at the monitoring stations
- Collect the sticky traps
  - If the traps haven't collected many beetles, Jessica will leave them out for 48-72 hours; always recording the date collected on the sticky trap
  - Sticky traps can be kept for counting at a later date by wrapping in plastic wrap..
- Then go through and cut the whole patch and harvest everything
  - Count total sellable and and total waste

End of season, Jessica will:

Informally survey dahlia growers in her region for their thoughts on pest pressure. These growers are experienced flower growers and will have a better idea of "average" damage.

### Emergency Management

Because there is no known precedence for this trial, Jessica's emergency back up plan includes the common practice of using organza fabric to provide barrier protection to blooms. This will be purchased as backup in case needed.

### Statistical test

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Statistical tests are not possible given that this is a demonstration site with no replication. The intent of this study was to show proof-of-concept that trap crops for cucumber beetles + cover crops that attract their predators can produce a marketable Dahlia crop.

**Materials and Research Expense Budget.** Prices are approximate; NA or in-kind for any materials that you already own or have access to. Please indicate if you intend to give any of the supplies to EFAO's Tool Library for others to use after you are finished with them.

Material	Quantity	Unit	Total Cost	EFAO's Tool Library (Y/N)
<a href="#">Hubbard squash seed</a>	130 seeds		\$32.95	N
Phacelia seed	\$8.94 a pound, 2 lbs needed		in-kind	N
<a href="#">Sticky traps</a> , yellow			\$30	N
Posts to hang traps on	10?		\$10	N
Organza fabric	1		\$20	N
<a href="#">Insect id services</a>				N
Straw mulch	4 bales per row, 6-8 rows, \$4ish a bale		\$100	N
<a href="#">Alyssum seed</a>	to grow out 80-150 plants, about 1 every 5 ft		in-kind	N
<b>Total</b>			\$202.73	

### Memorandum of Understanding

Please refer to [efao.ca/research-mou](http://efao.ca/research-mou) for Memorandum of Understanding.

### Acknowledgements

We thank Dr. Elizabeth Lamb, Abby Seaman and Dr. Amara Dunn (Cornell University, New York) and Dr. Jaime Piñero (Lincoln University, Missouri) for their time and expertise wading through the intricacies of integrated pest management. We also thank members of the Advisory Panel, Jason Hayes, Rebecca Ivanoff, Angie Koch, Ken Laing, Annie Richard, Darrell Roes, Steven Wolgram and Dr. Ralph Martin, for their thoughtful input that helped guide the design of this trial.

### Contact

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## Funding

Funding for this project was made possible by support from the Ontario Trillium Foundation and George Weston Limited and Loblaw Companies Limited.

