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.

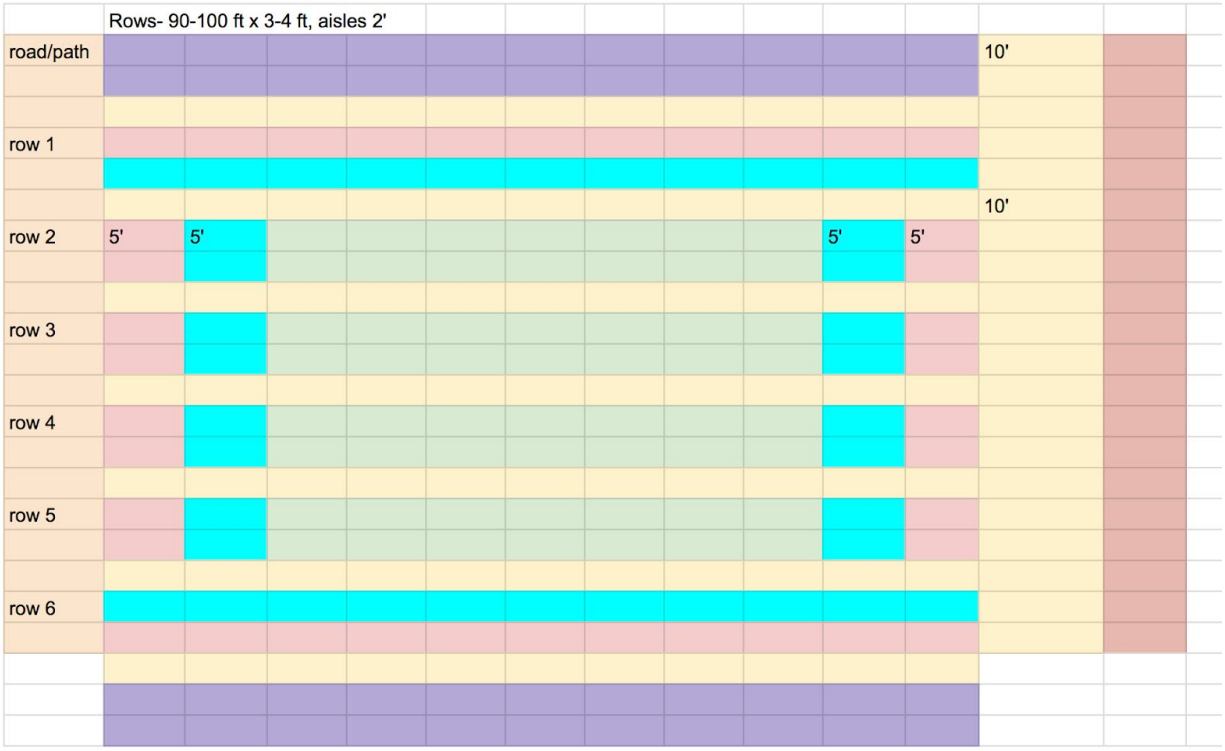
Background
Dahlias are one of the top 5 crops of small scale flower farmers, focused on local markets. Dahlias, however, are a ephemeral crops that can be delicate and difficult to ship. They also face higher pest pressure than other flower crops, including common agricultural pests like tarnished plant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

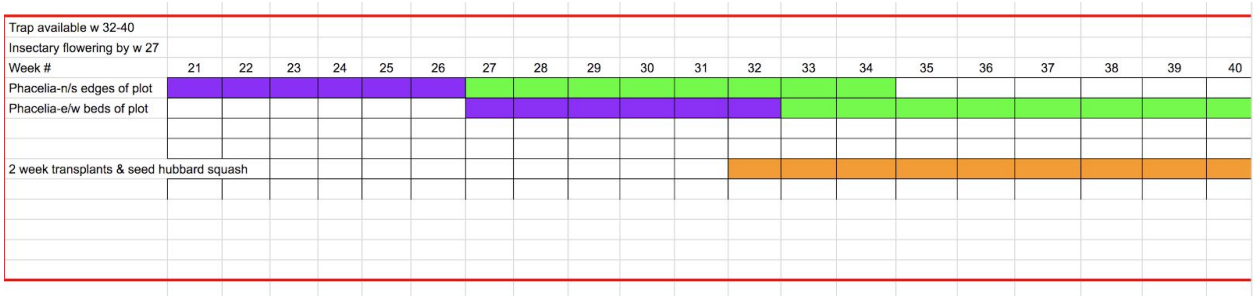
One method to manage pest pressure is with trap crops. Trap crops lure the spotted cucumber beetles to them, after which the beetles are killed on or near the trap crop. There is very little known about how to take advantage of the beetles natural enemies, including the tachnid fly. This fly predates on cucumber beetles, tarnish plant bug and other agricultural pests. It regularly eats pollen and nectar from flowers and deposits its eggs on near the head of prey or inserts them internally. As the eggs hatch, the host provides food to growing larva. Traditional methods that kill beetles on the trap crop controls would also eliminate potential future predator populations by killing hosts; collateral predator populations can be also killed accidently in broad-spectrum insecticides.

In her exploration of ecological systems for cucumber beetles and tarnish plant bug, Jessica seeks to create a balance: providing an alternative trap crop for the beetles to focus their attention to 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





Methods & Measurements

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
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)
Hubbard squash seed	130 seeds		$32.95	N
Phacelia seed	$8.94 a pound, 2 lbs needed		in-kind	N
Sticky traps, yellow			$30	N
Posts to hang traps on	10?		$10	N
Organza fabric	1		$20	N
Insect id services				N
Straw mulch	4 bales per row, 6-8 rows, $4ish a bale		$100	N
Alyssum seed	to grow out 80-150 plants, about 1 every 5 ft		in-kind	N
Total			$202.73	

Memorandum of Understanding

Please refer to **efao.ca/research-mou** for Memorandum of Understanding.

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