

RESEARCH PROTOCOL: HORTICULTURE 2017

Intercropping Onions and Brassica

Farmer-researcher

Ryan Thiessen, Creek Shore Farms

This document outlines the steps that Ryan will follow to execute his research trial, *Intercropping Onions and Brassicas*, including design, execution, data collection and data sharing. It also serves as a Memorandum of Understanding between Ryan and the EFAO. This work is in collaboration with Liette Vasseur at Brock University.

Research Question

Is onion growth affected by intercropped brassicas?

Experimental Design

In a paper pot transplanted system, the maximum spacing is 6" between plants. Ryan wants to try planting some brassicas, which would have to be every other "pot" in the chain, and onions seem like a good intercrop. Onions won't compete with the brassicas, may deter movement of cabbage loopers within row, and hopefully the brassicas won't affect the growth of the onions. Ryan will use 32 rows, each 90' with 27" spacing. The rows will be sectioned into 4 blocks with 8 rows each, and Ryan will assign treatments semi-randomly to each row. The design is semi-random to try to limit Diamondback Moth movement, with brassicas control beds randomized in the middle of each block; onion controls randomized on either side of the brassicas control; and broccoli with both spacing and cabbage with both spacing randomly assigned to the side beds.

Hypothesis: Intercropping will allow Ryan to optimize growing space and minimize pest pressure without impacting growth of onions or brassicas.

Semi-randomized complete block design with 4 blocks/replicates:

Broccoli with onion

Cabbage with onion

Onion alone

Broccoli alone

Cabbage alone

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
90'	8. Cabb age w/ 6" Onion	5. Broc coli w/ 4" Onion	2. Oni on 4"	3. Broc coli only	4. Cabb age only	1. Oni on 4"	7. Cabb age w/ 4" Onion	6. Broc coli w/ 6" Onion	7. Cabb age w/ 4" Onion	8. Cabb age w/ 6" Onion	2. Oni on 4"	4. Cabb age only	3. Broc coli only	1. Oni on 4"	5. Broc coli w/ 4" Onion	6. Broc coli w/ 6" Onion
	BLOCK 3								BLOCK 4							
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
90'	8. Cabb age w/ 6" Onion	6. Broc coli w/ 6" Onion	1. Oni on 4"	3. Broc coli only	4. Cabb age only	2. Oni on 4"	5. Broc coli w/ 4" Onion	7. Cabb age w/ 4" Onion	7. Cabb age w/ 4" Onion	8. Cabb age w/ 6" Onion	1. Oni on 4"	4. Cabb age only	3. Broc coli only	2. Oni on 4"	5. Broc coli w/ 4" Onion	6. Broc coli w/ 6" Onion

Methodological notes:

- Ryan's business as usual for pest control is nothing: no row cover or organic sprays
- All plantings must be thinned, or not... but there should be minimal double seeded onions or brassicas.
- Onion, cabbage and broccoli are all a single variety throughout the experiment
- Labour commitment will be hardest in September/October when the separate plots will have to be weighted and cleaned

Measurements:

- Quantity and weight of the onions: for each row, all onions will be harvested, cleaned, roots and greens trimmed evenly, and total onions and total weight per row will be recorded
- Symptom of etiolating in onion by observation
- Yield of cabbage and broccoli by observation and measurement, if time allows (experiment is focused on onion response)

- Percentage damage in broccoli
- Occurrence of Diamond back moth and cabbage looper (mainly)

Note that Diamond back moth data will be collected by Liette Vasseur's group at Brock University.

Statistical test:

- ANOVA with onion control and intercropping to test impact of intercropping and spacing on onions; ANOVA with brassicas controls and intercropping to test impact of intercropping and onion spacing on brassicas.

Research Expense Budget

- Paper pots, including unused because of trial design
- Seed

Around \$300 combined

- Additional research expenses pending approval

Memorandum of Understanding

Compensation for farmer-researcher:

- Farmer-fee of \$500 per farm
 - \$250 receivable upon acceptance of this Research Protocol and Memorandum Of Understanding (MOU)
Acceptance form: <https://goo.gl/forms/0wMjDHmoLzRwLJIE3>
 - \$250 receivable upon remittance of the experimental data and photos, no later than October 31, 2017
 - Reimbursement for approved research expenses
 - See budget above for approved research expenses
 - Fill out Reimbursement Form and send receipts (digital or hard copy)
Reimbursement form: <https://goo.gl/forms/6Rkj75dU7QGxBNDj2>
- Reimbursement for hotel stay at the Farmer-led Research Workshop, November 28, 2017 in conjunction with the EFAO Conference in Collingwood, Ontario

In addition to the compensation above, the EFAO will:

- Help set up Research Protocol, write and post Protocol in the Research Library
- Monitor progress of project, including check-ins and help with troubleshooting
- Deliver or mail a Farmer-Researcher farm gate sign
- Conduct training program related to on-farm research (training webinar link [here](#))
- Help analyze data, write and post a Research Report in the Research Library

Farmer-researcher will:

- Maintain current membership in EFAO
- Establish and conduct experiment as outlined in Research Protocol above
- Record data outlined in Protocol and/or data collection sheet

- Take high quality photos throughout the project
- Keep in contact with EFAO with updates, problems and questions
- Turn in data in a digital format and 3-10 best photos by October 31, 2017
- Complete feedback surveys related to the program
- Provide upto 1 hour of mentoring, including reviewing related protocols in 2017 and/or 2018, and phone consultation with fellow farmer-researchers on related projects.

If possible, the farmer-researcher will:

- Host a Field Day on their farm or participate in a “Field Day” webinar
- Attend and present at the Farmer-led Research Workshop November 28, 2017 in conjunction with the EFAO Conference in Collingwood, Ontario

Contact

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