

EFAO 2021: Research Protocol

## No-till broccoli in northern Ontario - v2

Farmer-researcher(s): Ryan Spence and Isabelle Spence-Legault, Field Good Farms / Ferme j'me champ bien

Project type: Research trial

Research priorities: Soil health, Weed control

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### Objective

Ryan and Isabelle are working to reduce soil tillage wherever possible. Towards this goal in 2020, they trialed growing no-till fall broccoli into a crimped cover crop. However, the 2020 trial results found that broccoli yield was too low for the method to be viable. To continue to explore this question, they would like to try a different approach to no-till broccoli using landscape fabric.

### 2020 Research Report

<https://efao.ca/wp-content/uploads/EFAO-Spence-Legault-2020-final.pdf>

### Research Question

Can no-till beds with landscape fabric produce comparable yields to tilled beds for fall broccoli in northeastern Ontario?

### Experimental Design

#### Field layout

The garden to be used has not yet been in no-till production. In 2020, horse manure compost was applied, disc harrows were passed, and fall rye was seeded as a cover crop. The cover crop will be terminated using tarps for 6 weeks prior to planting or tillage early in the spring.

The field layout for the trial is **four one hundred foot beds, divided in half with each half bed randomly assigned to no-till treatment (T) or control (C).**

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|   |   |   |   |
|---|---|---|---|
| C | T | T | C |
| T | C | C | T |

### Measurements

#### Yield

For both harvests, Ryan and Isabelle will measure **broccoli head equivalents and total weight** from each plot separately. For 8 plots and 2 harvests, this is a total of 16 measurements of head equivalents and 16 measurements of total weight.

#### Weed pressure

They will measure weed pressure through observation, labour hours to control weeds.

#### Soil temperature

They will use HOBO data loggers to measure soil temperature under the different treatments.

#### Labour

Ryan and Isabelle will use their standard labour tracking methods to track labour required for the different methods. Labour will be tracked on a treatment level (i.e. total labour for all no-till plots and total labour for all control plots), but not on a plot level.

#### Cost of production

Using labour hours and yield data, they will calculate the cost of production for these two methods of broccoli production.

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### Photos

Ryan and Isabelle will take photos of each plot throughout the season.

### Research Plan

| Time         | Task  | Methods & Measurements or Action Item  |
|--------------|---|--|
| May 5        | Apply compost to treatment and control;<br>Mow control rye;<br>Tarp treatment rye | 2 wheelbarrows of compost/plot (16 total)<br>Measure labour hours for each plot<br>Bury soil temperature meter |
| May 19       | Mow control rye   | Bush hog rye<br>Measure labour hours for each plot   |
| June 7       | Rototill control  | Walk-behind tiller<br>Measure labour hours for each plot   |
| July 12      | Rototill control;<br>transplant control and treatment broccoli                    | Measure labour hours for each plot   |
| July 26      | Weed transplant and control   | Measure labour hours for each plot<br>Take photos and notes of weed pressure                                   |
| August 26    | Weed transplant and control   | Measure labour hours for each plot<br>Take photos and notes of weed pressure                                   |
| September 27 | Harvest 1   | Measure labour hours for each plot<br>Measure broccoli head equivalents for each <b>plot.</b>                  |
| October 4    | Harvest 2   | Measure labour hours for each plot<br>Measure broccoli head equivalents for each <b>plot.</b>                  |

\*Please note that if data is submitted after the submission deadline, EFAO staff cannot guarantee that your data will be analyzed and written up before the Research Symposium and/or the next growing season.

### Staff check-ins

Mid-September

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### Materials

Please list all materials, supplies and equipment that will be reimbursed for this project. If possible, please also indicate a short-list of any in-kind materials, supplies and equipment that you will use.

| Material              | Unit | Quantity Required | Total Cost* | Note |
|-----------------------|------|-------------------|-------------|------|
| 6' woven ground cover |      |                   | \$150       |      |
| Drip tape             |      |                   | \$30        |      |
| Organic broccoli seed |      |                   | \$30        |      |
| Organic potting mix   |      |                   | \$5         |      |
| <b>Total</b>          |      |                   | \$325       |      |

### Farmer-fee

\$500 in 2021, invoiced to EFAO after farmer-researcher submits data.

### Invoices for Farmer-Fees & Reimbursements

#### Research expenses

- Email an invoice along with copies of receipts for all qualified expenses to **research@efao.ca**.
- Expenses can be claimed anytime throughout the year.
- Deadline: December 31, 2021

#### Farmer-fee

- Email an invoice for your farmer-fee to **research@efao.ca**.
- Farmer-fees can be claimed after your data is submitted
- Deadline: December 31, 2021
- If you collect HST for your farm business, you can choose to add HST to your fee.

### Memorandum of Understanding

You agree to keep an active membership with EFAO throughout the duration of your trial.

<https://form.jotform.com/210625202854246>

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To check the status of your membership, log in here:

<https://efao.z2systems.com/np/clients/efao/login.jsp> or contact Martina, [martina@efao.ca](mailto:martina@efao.ca).