

# EFAO HORTICULTURE 2020: Research Protocol

## No-till Sunflowers in the northern Ontario

Farmer-Researcher: Becky Porlier, The Colour Farm - North

Research Priorities: Soil Health, Cover Crops

EFAO Contact: Sarah Hargreaves, [sarah@efao.ca](mailto:sarah@efao.ca), 226-582-0626

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### Objective

To establish land for cut flower production on existing perennial pasture and grow no-till planted sunflowers in northern Ontario.

### Background

Sunflowers are a staple late summer, early fall crops that are very popular as a cut flower at local markets. They make up a significant part of The Colour Farm's total crop production and income, as they are very reliable, prolific, easy to grow and beautiful.

Becky is interested in no-till and wondering if they can maintain marketable yields of sunflowers in a no-till system. For The Colour Farm, the 2020 growing season marks the first at a new property where the soil has not been tilled in the past 30 years, and until 2012, was horse pasture. The fields have been mowed continually since 2012, aside from this past year. Turning permanent, long-term pasture into cultivated land poses an interesting challenge with perennial wild grasses to deal with.

### Experimental Design

Changed from transplanted to direct seeding on May 13, 2021 because of seed predation in the greenhouse.

**2020/2021 side-by-side: 15' x 30' section directly above Garden D**

Treatments:

- Tarp applied directly to perennial pasture and left for ~ 1 year followed by transplanting sunflowers in 2021
- This plot will be compared to research plots in Graden D with transplanted sunflowers at the main field in 2021

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## 2021 replicated trial: Garden D, beds 3' x 25' with a 1' walkway between

Treatments: 18 beds, 6 replicate blocks of **tillage**, **cover crop** and compost.

- Tillage (T): spring tillage
- **Cover crop mulch (CC)**: spring tillage before seeding cover cover and then mowing at base to terminate for mulch
- **Deep mulch (DM)**: 4" compost

Block 1			Block 2			Block 3			Block 4			Block 5			Block 6		
CC1	DM 1	T1	CC2	DM 2	T2	DM 3	T3	CC3	CC4	T4	DM 4	T5	CC5	DM 5	CC6	DM 6	T6

Becky will plant ProCut® sunflowers in all beds, with flower colours Double Quick Orange, Gol, Horizon, White and Red F1. Since the stem genetics is the same for all ProCut® colours, we are making the assumption that flower colour will not affect the results in this trial.

Measurements:

- Marketable yield (comparison only with no statistical analysis for the side-by-side)
- Cost of production (labour, direct costs)

## Statistical model

Garden D: Randomized complete block design with 6 blocks (one-way ANOVA)

## Research Plan

Time	Task	Methods & Measurements or Action Item
Spring	Lay out side-by-side plots and lay out tarps	<ul style="list-style-type: none"> <li>• Make map of area; take photos of before and after</li> <li>• Secure tarps</li> </ul>
Growing season ~ 1/month	Record observations, photos	<ul style="list-style-type: none"> <li>• 1/month:</li> <li>• Lift up tarp and take notes and photos of how the tarp is working</li> </ul>

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October 15, 2020	Submit observations and photos	Submit observations and photos to Sarah
After data is submitted to Sarah	Invoice	Send Sarah invoice for farmer-fee
2021		
Early spring	Bed prep for cover crop plots	<ul style="list-style-type: none"> <li>• Mark out all plot sections with pin flags and label flats with plot ID (see map above)</li> <li>• Till control plots and cover crop lots</li> <li>• Plant the cover crop of oats/peas/barley (~April 10))</li> <li>• Record all information</li> </ul>
~60 days post planting cover crops (milk stage for oats)	Terminate cover crops	<ul style="list-style-type: none"> <li>• <b>Mowing at base of cover crop with a string trimmer</b> at the milk stage for the oats.</li> </ul>
May 24 target	Seed	<ul style="list-style-type: none"> <li>• Mix seed from all colours before seeding</li> <li>• Seed mix-coloured sunflowers for transplanting in June</li> </ul>
June 7 target	Plant	<ul style="list-style-type: none"> <li>• Transplant sunflowers in all plots on the same day, if possible.</li> <li>• Record planting date and flower colour varieties for each bed.</li> </ul>
July 19-ish - 2 to 3 week window	Harvest and measure; harvests are every other day for ~ 2 weeks	<p><b>Marketable yield from each plot</b></p> <ul style="list-style-type: none"> <li>• Pre-label 19 buckets with plot ID (e.g. P4)</li> <li>• <b>(18 for Garden D + 1 for no-till site)</b></li> <li>• For each harvest, harvest all marketable stems into pre-labeled buckets (harvest at cracking bud stage)</li> <li>• Bring to the barn and count and record the number of stems.</li> </ul>
October 1 (or sooner)	Submit data and photos	Submit data and photos to Sarah
After data is submitted to Sarah	Invoice	Send Sarah invoice for farmer-fee

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### Materials

Please list all the equipment that you need for this project. Indicate “in-kind” under Total Cost for any materials that you already own or have access to. For pre-approved research expenses, for which you will be reimbursed, please indicate cost.

Material	Quantity Required	Total Cost*
Compost	12.5' long: 360 sq ft 4 inches (100 ft <sup>3</sup> ) at \$200/M <sup>3</sup> = 2.8 M <sup>3</sup> = \$560	\$230
Cover crop seed	Peas/Oats organic Krauss Farm and Feed 450 sq ft 1.24 lbs = 1 kg	\$20.00
Tarp	Dubois Agriculture silage tarp - 25' x 50'	\$121
ProCut® Sunflower Seed from Johnny's Seeding details <a href="#">here</a> .	7560 total transplants (105 tray 72s)	\$251.40 USD
Tiller rental	\$96.00 / day + tax	\$108.50
Flags and buckets?	pending	...
Total		<b>\$730.90</b>

\* For approved research expenses

**Farmer-fee:** \$250 in 2020 and \$500 in 2021, invoiced to EFAO after farmer-researcher submits data.

### Memorandum of Understanding

Farmer-researchers agree to keep an active membership with EFAO throughout the duration of their trial. Reimbursement for research expenses and farmer-fees will be paid to current members only.

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

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).