

# Farmer-Led Research 2019: Evaluation of Winter-Hardy Field Peas for use as a Winter Cover Crop in Ontario



COVER CROPS



POLLINATOR  
SERVICES



SEED PRODUCTION  
& BREEDING



SOIL HEALTH



WEED CONTROL

Farmer-Researcher(s):

Duane Falk, Mimosa Breeding and Research (West)

EFAO Contact

Sarah Hargreaves, [sarah@efao.ca](mailto:sarah@efao.ca), 226-582-0626 (chat and textable)

Rebecca Ivanoff, [rebecca@efao.ca](mailto:rebecca@efao.ca)

This document outlines the steps that Duane Falk will follow to execute his research project, *Evaluation of Winter-Hardy Field Peas for use as a Winter Cover Crop in Ontario*, including design, execution, data collection and data sharing. It also serves as a Memorandum of Understanding between Duane Falk and EFAO.

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## Background

A strong interest by organic and conventional farmers including larger market and CSA gardeners, in winter cover crops, particularly nitrogen-fixing cover crops, has stimulated Duane to investigate the possibility of using winter peas in that role.

## Experimental Design

Duane will evaluate a number of different varieties of winter-hardy field peas to determine if any of them have sufficient cold tolerance and suitable agronomics to work as winter cover crops in Ontario.

## Methods and Materials

Duane will conduct this project as a replicated (3 or 4 replicates), complete randomized block design using large plots planted with a seed drill. Duane will try to get up to 10 entries from various sources having very hardy material. Controls would be cereals of known winter hardy levels (ie oats, winter barley, winter wheat, winter rye) included in border plots.

## Breeding Timeline

Duane hopes that there is good differential winter kill in the first winter to identify the best potential lines. He will then narrow the varieties down to the best few in the second year, at which point the trials would be run at a wider range of environments. The winters of 2019/20 and 2010/21 are crucial, and the project could be wrapped up in the summer of 2021 if all goes well. If there is no differential winter kill (all or no survival) in 2019/20, it would add one additional year to the project so that it would finish in summer 2022.

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## Measurements

- Winter survival as percentage of emerging plants in the fall that are alive and vigorous in the spring
- Biomass yield dry matter yield of above-ground plant parts at various times during the growing season as samples from small quadrats in each trial plot.
- Mature grain yield as yield of dry peas at final harvest.
- Ground coverage will be measured as amount of exposed soil vs herbage in small quadrats in each trial plot at various times during the growing season.

## Research Expense Budget

| Material   | Quantity                     | Unit                     | Total Cost  | EFAO's Tool Library (Y/N) |
|--|------------------------------|--------------------------|---|---------------------------|
| Seed (1-5 kg) of a number of varieties of winter field peas (most likely brought in from USA and Europe) | 10 varieties                 | 1-5kg @ \$3/kg - \$10/kg | Up to \$150<br>-includes shipping<br>-many from US which need customs clearance | n/a                       |
| cereal grain (3-10 kg) (from Ontario sources),   | 3-10                         | \$25/25kg bag            | Up to \$75  | n/a                       |
| land rental costs  | ½-1 acre                     | \$1500/acre              | Up to \$500   | n/a                       |
| equipment costs (fuel, etc)  | Covered in land rental costs |                          |   | n/a                       |
|  |                              |                          | Total inputs could be \$500-\$700.  |                           |

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## Research Calendar

| Time                        | Task  | Action Item          |
|-----------------------------|---|----------------------|
| Late April/early May        | Seeding increase plots                          | Rebecca will email   |
| Mid June/mid July           | Sampling of biomass                             | Rebecca will email   |
| Mid June/mid August         | Notes on disease and plant type of each variety | Rebecca will email   |
| Late July/mid August        | Harvesting mature pea seed                      | Rebecca will email   |
| August                      | Cleaning seed<br>Analyzing data                 | Rebecca will email   |
| Late August/early September | Planting plots for winter survival              | Rebecca will email   |
| Mid October                 | Collecting data on fall establishment of plants | Rebecca will email   |
| Mid April/mid May (2020)    | Winter survival scoring                         | (Rebecca will email) |

Deadline for data, progress report and photo submission

Preliminary report, photos, etc should be available in early September,

Final report (2019), including fall establishment for following season, in late October.

## Memorandum of Understanding

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

## Acknowledgements

We thank members of the Advisory Panel, Jason Hayes, Matt Jones, Ken Laing, Annie Richard, Darrell Roes, Steven Wolgram and Dr. Ralph Martin, for their thoughtful input that helped guide the design of this trial. Dr. Kevin McPhee, Montana State University has been very helpful in identifying sources of more winter hardy varieties for testing. Mr. Mark Olsen, Alberta Agriculture and Forestry, has been very supportive in supplying seed of Spector and Windham winter peas for preliminary trials in 2018.

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## Funding

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The Robert and Moira Ideas Foundation,  
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Ontario  
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Fondation Trillium  
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An agency of the Government of Ontario  
Un organisme du gouvernement de l'Ontario