

Farmer-Led Research 2019: **Cut flower isolation distance**



SEED PRODUCTION
& BREEDING

Farmer-Researcher:

Kim Delaney, Hawthorn Farm Organic Seeds (West)

EFAO Contact

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This document outlines the steps that Kim will follow to execute her research project, *Cut flower isolation distance*, including design, execution, data collection and data sharing. It also serves as a Memorandum of Understanding between Kim and EFAO.

Background

With local cut flower production blooming in Ontario, there's a need for more information on how to grow cut flower seed to meet the demands from growers. However, isolation distance for cut flower seed production is notoriously undocumented and, often, proprietary. Currently, Kim uses an isolation distance of 800 ft for her cut flower seed production but she'd like reduce this distance in order to free up space for greater flexibility in production.

Methods & Design

Kim will test isolation distance using *Cosmos*, a flowering plant used for cut flower production that produces simple flowers and is insect (bee) pollinated.

Specifically, Kim will grow two plots of **white Cosmos**:

- Plot one at an isolation distance of **400 ft** from pink (dominant) *Cosmos*
- Plot two at an isolation distance of **600 ft** from pink (dominant) *Cosmos*

For each isolation distance, she will harvest seed starting in August until first frost, mix all seed harvested, and quantify the seed (weigh, count).

In 2020, she will grow out at least **200** randomly selected seed from each isolation distance. After reaching out to seed experts across the continent, Kim chose 200 seed minimum based on this response from a breeder at Johnny's Seeds.

"I don't think there's really a solid genetics answer to the question. They'll really just want to plant as many plants as they can handle...If it were my experiment, I probably wouldn't want to do less than 200 plants, but that's kind of a randomly picked number."

She will calculate the **% outcrossing by comparing:**

number of plants with white flowers / number of plants with pink flowers.

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This trial differs from standard research trials in that Kim is testing two new isolation distances with no replicates, and she is not testing her “business-as-usual”/control distance of 800 ft. These deviations are for practical reasons, as Kim doesn’t have space to test three distances in replicate. We justify these deviations because, even though Kim will not directly compare to 800 ft, it is a standard distance that Kim has used for over a decade and is commonly used by other cut flower seed growers.

Further, we justify the lack of replicates because these results will test 600 ft and 400 ft under conservative circumstances including:

- Kim’s farm has very high pollinator pressure. It has been certified organic since 1996 and no sprays were used since the 1960’s. It also has approx. 90 acres of wild habitat so pollinators are abundant. There are also 24 honey bee hives on the 100 acre property.
- *Cosmos* has simple flowers that are very attractive to bees and easy to pollinate
 - If Kim detects no crossing at 400 or 600 ft, then there’s added confidence with double flowers, which are harder to pollinate
- For both plots (400 ft and 600 ft isolation distances), Kim will plant a barrier that is unattractive to bees, e.g. bush beans or other unappealing flower

Measurements

Kim will record basic management information like date planted, location, barrier species planted for each distance, and statistics on seed harvested (weight and/or count). In 2020, Kim will record information about # of seeds planted, and outcrossing data.

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)
Seed	In-kind	-	-	N

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Research Calendar

Time	Task	Action Item
Monthly	Monthly check ins	Sarah will email

Deadline for data, progress report and photo submission

October 1, 2019

Memorandum of Understanding

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

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