Farmer-Led Research 2019: **Southern Ontario Participatory Pepper Breeding Project**

SEED PRODUCTION & BREEDING COMMUNITY

Farmer-Researcher(s):

Annie Richard, Kitchen Table Seed House (East) and SeedWorks (West/East)
Greta Kryger, Greta's Organic Gardens (East)
Kathy Rothermel, Kitchen Table Seed House (East)
Kim Delaney and Aaron Lyons, Hawthorn Farm Organic Seeds (West)
Rebecca Ivanoff, SeedWorks (West/East)

EFAO Contact

Sarah Hargreaves, sarah@efao.ca, 226-582-0626 (chat and textable)
Rebecca Ivanoff, rebecca@efao.ca

This document outlines the steps that Kathy, Annie, Greta, Kim/Aaron, and Rebecca will follow to execute their research project, *Southern Ontario Participatory Pepper Breeding Project*, including design, execution, data collection and data sharing. It also serves as a Memorandum of Understanding between Kathy, Annie, Greta, Kim/Aaron, and Rebecca, and EFAO.

Background

This project started in 2016 using seed obtained from Dr. Michael Mazourek's breeding program at Cornell University of a cross made between commercial varieties Ace and Aristotle. The 2019 season will be the fourth year of growing out the cross Ace F1 x Aristotle F1 at three different locations in the province (Ottawa, Wolfe Island/Kingston, Acton/Hillsburgh/Guelph). The farmers are growing a Mass Selected Population and two different projects of Progeny Lines. The mass selected population will always hold more genetic diversity and, therefore, be more variable. The yellow and red progeny lines offers a more stable line of each colour, for growers who require that.

In Autumn 2018, the plant breeding club SeedWorks was formed. This project will continue forward under the auspices of this group.

For more information, please refer to:
Protocol 2017
Report 2017
Protocol 2018
Report 2018

Breeding Goals

To breed an early, blocky pepper with good flavour that is adapted to ecological growing systems in southern Ontario.

Breeding Methods

The group is continuing to work on both a wide populated of mass selected blocky red peppers, and two progeny lines, one of red and one of yellow. For all lines, the group will use the **Pepper Descriptor Form.**

For their yellow progeny line, Kim/Aaron and Greta will grow out 12 plants of each selection of the best yellow peppers from last year (4-5 selections). Each of the plots of 12 plants will be covered to allow peppers to self-pollinate. Once fruit has formed, they will remove the cover and mark the selfed fruit with nursery marker or flags. The same process will take place for the red progeny lines that Kathy and Annie will grow out at Kitchen Table Seed House. Progeny lines that do not meet the criteria will be discarded, and the best plants of the best 2-3 plots will be saved to grow out again next year.

Rebecca, Greta, and Annie and Kathy will also grow the mass selected population, in addition to the progeny lines. This year they will save the seeds from our favourite blocky, red, flavourful, red peppers, and save that seed as stock seed for our 2020 breeding work. They will also harvest seed from many more early ripening, blocky, flavourful peppers, which they can use for grow-outs in variety trials in 2020. They will be separated from each other, and all other peppers, by at least 45 meters.

They will continue to hold blind taste tests to confirm that selections are indeed more flavourful than their parent varieties.

Annie will also use seed from the mass selected population as a variety in a replicated variety trial she will be performing as part of a program run through the Bauta Family Initiative on Canadian Seed Security. Our population will be compared to Ace F1, Early Red Sweet, Peacework, King of the North, North meets South and Orange marmalade (SBGO 10408).

Breeding Timeline

They anticipate that our wide population will be ready to be released in another 2 years. They hope to use the variety trialing network set up by The Bauta Family Initiative on Canadian Seed Security across Canada to assess our mass selected population in 2020. They anticipate that our stable lines will be released in about 4 years.

Measurements

They will all fill in **this form.**

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)	Grower
Protect Net insect Netting	1 (FIINTE2, 2X100-17) 7.2 ' x 328' From Dubois		$295	N	Annie
Protect Net insect Netting	INSECT NETTING 2,1M X 50M 25G from Dubois	Sub total 205.00 plus HST 26.65 Grand total CAD 231.65	$231.65	N	Rebecca
Place to plant the mass selection and checks	1000 sq. feet of land at Ignatius' Community Gardens	$160.00	$160.00	N	Rebecca
Checks (Ace and Aristotle Seed)		$3.50 for each packet and $13.50 for shipping	$20.25 USD ($26.99 CDN)	N	Rebecca
Total cost			$713.64		

Research Calendar

Time	Task	Action Item
March 25th to April 15th	Seeding of pepper seed (progeny lines, mass selection and two check varieties)	Rebecca will email the team
May 20th to 27th	Transplant peppers into the field and cover them for isolation.	Rebecca will email the team
Mid August to mid September	Record date of first ripened fruit, start flagging plants with early ripening fruit.	Rebecca will email the team
Late August to late September	Take a photo of representative ripe fruit alongside check varieties	Rebecca will email the team
Late August to late September	Have a blind tasting of selected fruit alongside check varieties	Rebecca will email the team
Late August to late September	Take measurements of progeny lines as per the record sheet?	Rebecca will email the team
Late August to late September	Reminder to collect more seeds for a bulk supply in 2020	Rebecca will email the team

Deadline for data, progress report and photo submission

October 1, 2019 for the pepper breeding trial and October 31, 2019 for the pepper variety trial.

Memorandum of Understanding

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

Pledge for Breeders

You are free to use these seeds however you choose but by accepting them agree to not restrict the rights of others to save, replant, or breed with them.
By accepting these seeds you are becoming part of the story of farmer-breeders dedicated to on-farm plant breeding to meet the needs of ecological farming conditions in their regions.

Acknowledgements

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