

Is it possible to breed an early, blocky pepper with good flavour that is adapted to organic systems in southern Ontario?



MULTI-FARM



SEED PRODUCTION & BREEDING



Farmer-Researchers

Rebecca Ivanoff
Unaffiliated - Central

Greta Kryger
Greta's Organic Gardens - East

Annie Richard & Kathy Rothermel
Kitchen Table Seed House - East

Project Timeline: 2016 - 2020

In A Nutshell

Four growers continued to select and stabilize peppers for their breeding project. Progress was made towards stabilizing the developing variety.

Progress to Date:

- Growers made progress towards stabilizing the lines of red and yellow peppers
- A red pepper from this developing line won a blind taste test and was generally rated with great flavour
- Measurements confirmed blocky-ness
- Growers will formalize the stabilization and aim to send the variety to market in 2020

METHODS

Breeding goal

To breed an early ripening, blocky red and yellow pepper with low shoulders, bright colour, good yield and good flavour that is adapted to organic growing systems in southern Ontario.

Summary

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 2018 season was the third year of growing out the cross Ace F1 x Aristotle F1 at three different locations in the province (Ottawa, Wolfe Island, Hillsburgh).

They are growing a **Mass Selected Population** and **Progeny Line**. The mass selected population will always hold more genetic diversity and, therefore, be more variable. The progeny line offers a more stable line, for growers who require that.

RESULTS TO DATE

Mass Selected Population

Table 1

Summary for Mass Selected Population (F3)			
Activity	Annie and Kathy	Rebecca	Greta
Seeds sown	Apr 14	Apr 13	Mar 27
Transplant date	May 24	Jun 13	June 10
# Plants transplanted	85	116	140
First fruit ripened	Aug 17	Sep 10	Aug 23
Flavour rating	5/5	4/5	4/5
Crunchiness rating	4/5	4/5	4/5



Left: Pepper patch in Rebecca's garden.

Right: A selection of yellow peppers for measurement.

Table 2

Measurements of blocky-ness for the mass selected population		
Plant	Length (cm)	Width (cm)
A	10	8
B	9.5	8.5
C	11	9
D	10	10
E	11	10

Blind Taste Test at Farmers Market in Kingston



- 51 votes for the pepper from mass selected population - **winner!**
- 31 votes for a commercial variety
- 30 votes for a commercial variety
- 29 votes for Ace, a project check variety

Progeny Line Selection

Table 3

Summary for Progeny Line Selections			
Activity	Annie and Kathy	Rebecca	Greta
Pepper type and generation	Red F3	Yellow F3	Yellow F3
Seeds sow	Apr 14	Apr 13	Mar 27
Transplant date	May 25	Jun 8	June 10
# Plants transplanted	6 x 12 = 72	6 x 12 = 72	6 x 12 = 72
First fruit ripened	Aug 15	-	Aug 15
Flavour rating	5/5	-	5/5
Crunchiness rating	4/5	-	4/5

Table 4

Measurements of blocky-ness for the progeny line selection at Annie's (red) and Greta's (yellow)			
Colour	Plant	Length (cm)	Width (cm)
Red	1	9	7
Red	2	8.5	8
Red	7	9.3	8
Red	11	8	7
Yellow	1	10	8
Yellow	2	9	9
Yellow	3	11	10
Yellow	4	11	11

SUMMARY

- Overall, despite the challenging hot/dry season, the growers observed progress for red and yellow pepper lines: **peppers are tasty and blocky!**
- There is still some variability in plant stature and fruit shape and size, but all growers observed less than the previous year.
- All growers observed yellow peppers in the red pepper plots, though there were fewer reported than in previous years. The yellow peppers will likely remain in the population at a low rate, unless the mass selected population stabilizes through selfing.
- Growers harvested seeds from the mass selection from two of the three plots.
- Two growers continue to select and stabilize a yellow blocky pepper line out of the mass selected population while the other two growers continue on to stabilize a red line.

NEXT STEPS

- Combine seed harvested from mass selection and redistribute for growing and selecting another round of peppers from the mass selection population in 2019.
- Formalize how to stabilize selections in order to assess market readiness.
- Continue to hold blind taste tests to confirm that selections are indeed more flavourful than their parent varieties.
- Decide potential to grow out seed for distribution to market for the 2020 season.

Breeder's Pledge

I have the freedom to use the seeds generated from my farmer-led research project in any way I choose. In return, I pledge not to restrict others' use of these seeds or their derivatives by patents or other means, and to include this pledge with any transfer of these seeds or their derivatives.