

Research Report: HORTICULTURE 2017

Southern Ontario Pepper Breeding Project



FARMER-RESEARCHER BREEDERS (left to right)

Rebecca Ivanoff, Whole Circle Farm - Central Region
Greta Kryger, Greta's Organic Gardens - East Region
Annie Richard, Patchwork Gardens - East Region
Kathy Rothenmel, Mouse Seeds at Windkeeper Community Farm - East Region

WHY IT MATTERS

Ecological farmers in southern Ontario do not have access to an early ripening bell pepper that is available in organic seed or bred for organic production systems. **To meet this need, Greta, Rebecca, Annie and Kathy are selecting red and yellow peppers while building a network of regional vegetable seed breeders!**

BREEDING OBJECTIVE

To produce early ripening, blocky red and yellow bell peppers with good flavour for organic field production in southern Ontario

METHODS

This participatory pepper-breeding project started in 2016 using seed obtained from Dr. Michael Mazourek's breeding program at Cornell University, which he derived from a cross made between commercial varieties *Ace* and *Aristotle*.

The four growers in Ontario are working together and using mass selection to select best peppers for the project's goal of creating an early, blocky red pepper with good flavor that is adapted to organic growing systems in southern Ontario.

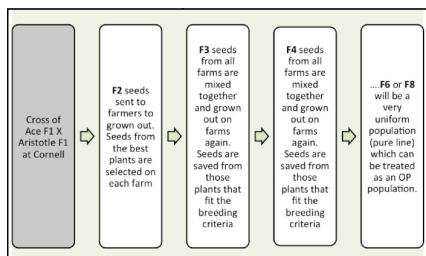


Figure 1. Selection method used to produce early ripening, flavourful, blocky red and yellow peppers.

The 2017 growing season was the second year of growing out the cross *Ace F1* x *Aristotle F1* (F3 seed) at the four different locations in the province (Ottawa, Wolfe Island, Battersea, Acton). Selecting for earliness, blocky shaped fruit with low shoulders, and bright red colour with good yield potential and good flavour.



Red pepper seedlings in the greenhouse.

RESULTS

The 2017 growing season was very challenging, with a wet spring and wetter summer on all of four farms.

At some point in the season, all four growers contended with plants being overwatered and some had standing water in their fields; they also reported some lodging of plants.

One grower's plants were left in the greenhouse too long, and went into the ground when they were leggy and stressed before being pounded by a lot of rain.



Stressed plant

Project Summary

Seeds Sown: 150+

Dates	Greta	Rebecca	Annie	Kathy
Seeds sown	Mar 23	Mar 31	Mar 21	Mar 30
Flower opening	Early July	NA	Jun 1	Jun 6
First ripened fruit	Aug 20	First week in Aug	Sep 4*	Aug 20/25

**Annie's first peppers ripened on Sep 5, before check plantings. This was later than others because all plants were stripped and allowed to "restart" due to the stressful growing conditions. Annie will not include 2017 seed in the 2018 grow-out because she does not feel confident that her selections under such poor growing conditions reflected the genetic potential of plants.*



Field layout at Annie's plot (left) and Kathy's farm (right).

SELECTION PROGRESS



Early ripening, blocky red peppers!

Greta and Rebecca are also selecting for early ripening, blocky yellow peppers.

Despite the challenging wet season, progress was made for both red and yellow blocky pepper lines.

- There is still some variability in plant stature and fruit shape and size, but less than the previous year.
- Yellow peppers were observed in all plots, though less reported than previous year.
- All four growers made selections and harvested seed.
- Collectively they harvested **over 40g of seed from red pepper selections**. These seeds, excluding Annie's, will be combined and redistributed for another round of mass selection in 2018.
- Greta and Rebecca continued to select a yellow blocky pepper line out of the mass selected population.



Greta describes how to scout and flag early ripening red peppers at an EFAO field tour hosted by Rebecca, Whole Circle Farm.

FUNDING
Ontario Trillium Foundation

Fondation Trillium de l'Ontario

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SEEDING
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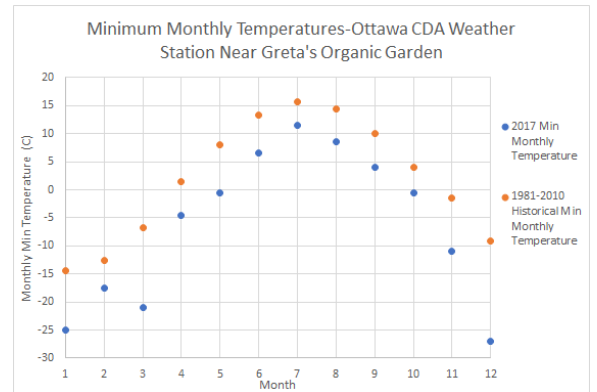
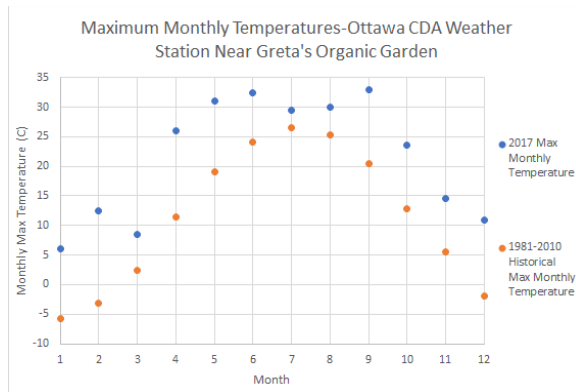
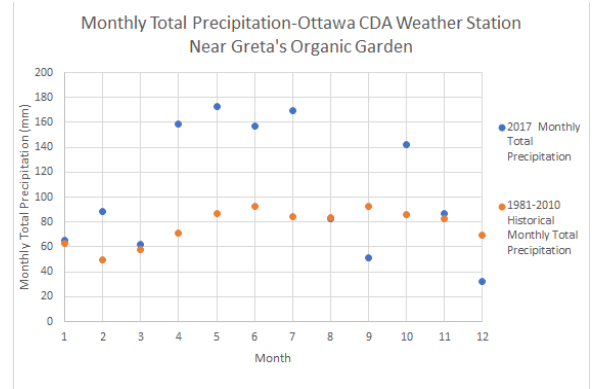
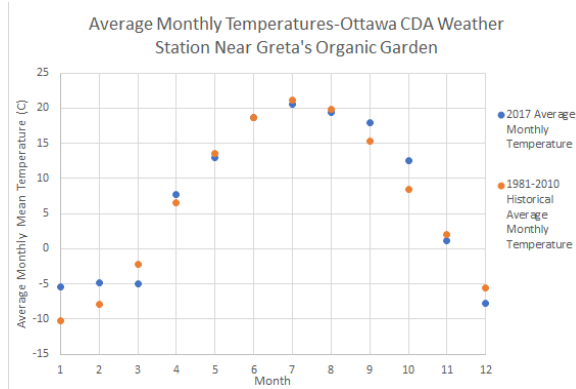
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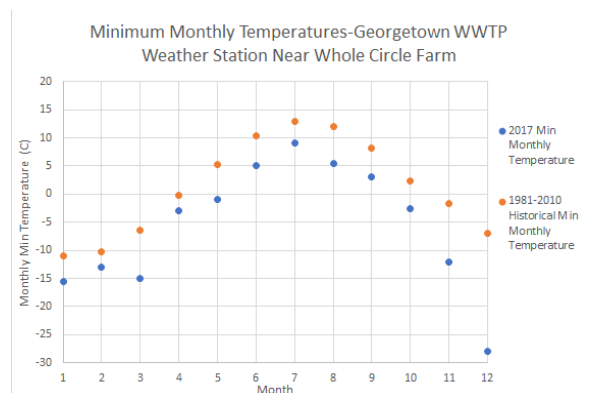
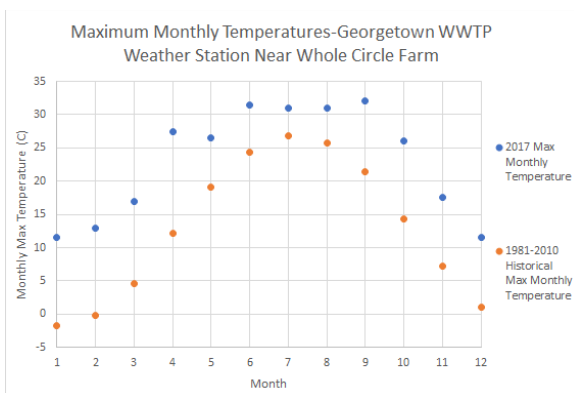
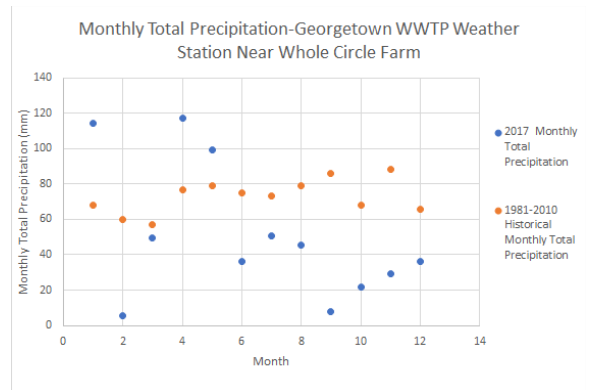
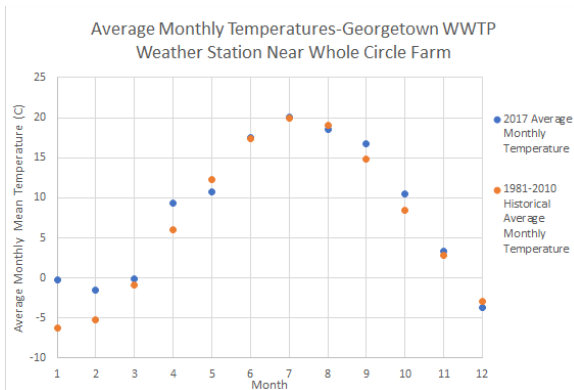


Weather Data: Monthly temperatures and precipitation for 2017 and historical averages.

Ottawa CDA was selected as the weather station for Greta's Organic Garden. It is located 8.65 km from the farm.



Georgetown WWTP was selected as the weather station for Whole Circle Farm. It is located 17.43 km from the farm.



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Hartington IHD was selected as the weather station for Mouse Seeds at Windkeeper Community Farm and Patchwork Farm. It is located 35.40 km from Windkeeper Community Farm and 24.7 km from Patchwork Farm.

