Pepper Breeding Project

Southern Ontario Participatory Pepper Breeding Project

**BACKGROUND**

This project started in 2016 using seed obtained from Dr. Michael Mazurek’s breeding program at Cornell University of a cross made between commercial varieties Ace and Aristotle. The 2019 season was 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 progeny lines offer more stable lines, 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.

**METHODS**

**Breeding Goals**

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

**Breeding Methods**

For their yellow progeny line, Kim and Greta grew out 12 plants of each selection of the best yellow peppers from last year (4-5 selections). They covered each of the plots of 12 plants to allow peppers to self-pollinate. Once fruit formed, they removed the cover and marked the selfed fruit with nursery markers or flags. Progeny lines that did not meet the criteria were discarded, and the best plants of the best 2-3 plots were saved to grow out again next year. Note that the same process was planned to take place for the red progeny lines at Kitchen Table Seed House, but a crop failure due to weather prevented this.

In addition to the progeny lines, Rebecca, Greta, and Annie and Kathy also grew the mass selected population. They separated the breeding plots from each other, and all other peppers, by at least 45 meters or more. The mass selected population will always hold more genetic diversity and, therefore, be more variable. The progeny lines offer more stable lines, 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.

**RESULTS**

**Peppers at Greta’s farm were also slow to ripen; however two of the progeny lines were able to ripen much sooner than many other varieties. Greta selected two progeny lines for future evaluation.**

**Red Progeny Line**

Due to the wet, cold spring followed by a lot of heat and no rain, the red progeny lines were a crop failure at Kitchen Table Seed House.

**Yellow Progeny**

At Kim’s farm, all 12 varieties of peppers that she grew out for seed were very late to ripen, and some needed to be brought in before the last frost and hung to ripen in rafters. One of the progeny lines was significantly more uniform, early, and blocky than the rest. Despite the hard season, the progeny line that Kim selected was sweet and tasty and had a nice crunch to it.

**Acknowledgements**

We thank Dr. Michael Mazurek and the members of his plant breeding lab at Cornell University for their expertise and encouragement. Photo of Kim Delaney is courtesy of SeedChange.

**Next Steps**

SeedWorks Plant Breeding Club hopes to work next year with the Bauta Family Initiative on Canadian Seed Security to have their mass population trialed through the Canadian Organic Vegetable Improvement Project (CANOVI) network of trials. This will give them data on how well these peppers grow in organic fields across Canada and how well other farmers like the selection.

As Annie was not able to evaluate the red progeny lines this season, she will grow the lines in a heated greenhouse near Kingston. This will allow the group to evaluate the lines for uniformity and taste and hopefully be able to release a red stable variety sooner along with the yellow lines.