

Canadian Agri-Science Cluster for Horticulture 3



Update to Industry

Final Report – 2018 – 2023

Activity title: The Canadian Berry Trial Network

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Activity Objectives:

The Canadian Berry Trial Network (CBTN) project involves testing new varieties and selections of strawberry, raspberry and blueberry in four provinces across Canada: British Columbia (BC), Ontario (ON), Quebec (QC) and Nova Scotia (NS).

- The objective for Phase I (2018-2019) was to initiate the project through an in-person meeting and the development of an experimental design. Phase I also included plant propagation, field preparation and the acquisition of research materials and supplies.
- The objective for Phase II (2019-2023) was to establish and evaluate standard varieties, new varieties and advanced selections of raspberry, blueberry and strawberry in the four provinces.
- The objective for Phase III (2020-2023) was to share the results of the trials with our industry partners and to discuss commercial opportunities for some of the new trial varieties and selections.

Research Progress & Results:

Replicated Trials

The CBTN performed strawberry and raspberry variety evaluations during 2019-2022. The high bush blueberry trials were established in 2022. The trials included numbered selections, new named cultivars, and industry standards. Summary results from the 2019-2022 growing seasons are presented below.

Day-Neutral Strawberry

Ten strawberry varieties were evaluated between 2019 and 2022. In general, the top performing varieties were:

PROVINCE	VARIETIES	CHARACTERISTICS			
		Season Start	Harvest	Yield	Fruit Size
Quebec (plasticulture)	BC 10-2-1	Very early	16 weeks (3 wk. pause)	300 g / plant	14 g
	AAC DYNAMIK	Early	16 weeks (2 wk. pause)	400 g / plant	12 g
	SEASCAPE	Early	16 weeks (3 wk. pause)	400 g / plant	12 g
Nova Scotia (plasticulture)	AAC DYNAMIK	Early	17 weeks (2 wk. pause)	200 g / plant	11 g
	K16-31 DN	Early-mid	16 weeks (4 wk. pause)	200 g / plant	13 g
	SEASCAPE	Early-mid	16 weeks (4 wk. pause)	300 g / plant	12 g
Ontario (plasticulture)	VALIANT	Fall harvest only	8 weeks	400 g / plant	14 g
	BC 10-2-1	Fall harvest only	8 weeks	400 g / plant	10 g
	ROYAL ROYCE	Fall harvest only	8 weeks	500 g / plant	14 g
British Columbia (on-farm trials)	BC 10-2-1	Early first flush (equivalent to 'Albion') and slightly later second flush (one week later than 'Albion').			
	SALMA	To be determined, but good fall fruit quality in establishment year (2022).			

The varieties planted in 2022 are: ALBION, SEASCAPE, AAC DYNAMIK, BC 10-2-1, K16-31 DN, K17-08 DN, MURANO, SHANNON M KENT, FLORIDA BEAUTY, UCD FINN, UCD MOJO, SALMA

June-bearing Strawberry

Twenty-five strawberry varieties were evaluated between 2019 and 2022. In general, the top performing varieties were:

PROVINCE	VARIETIES	CHARACTERISTICS			
		Season	Harvest	Yield	Fruit Size
Quebec (plasticulture)	CAVENDISH	Mid	4 weeks	300 g / plant	13 g
	SUMMER EVENING	Late	2 weeks	200 g / plant	13 g
	VALLEY SUNSET	Late	2 weeks	200 g / plant	18 g
Nova Scotia (matted row)	AAC LILA	Early-Mid	2 weeks	800 g / plant	20 g
	K14-4	Late	2 weeks	800 g / plant	20 g
	K16-21	Late	2 weeks	800 g / plant	20 g
Ontario (matted row)	DARSELECT	Early-mid	2.5 weeks	1400 g / m row	15 g
	JEWEL	Mid-late	2.5 weeks	1400 g / m row	12 g
	SUMMER EVENING	Late	2.5 weeks	1400 g / m row	11 g
PROVINCE	VARIETIES	CHARACTERISTICS			
British Columbia (on-farm trials)	UCD WARRIOR	Season	Harvest	Yield	Fruit Size
	UCD VICTOR	TBD in 2023, but good fall fruit quality in establishment year (2022).			

The varieties planted in 2022 are: WENDY, CAVENDISH, JEWEL, VALLEY SUNSET, AAC AUDREY, AAC EVELYN, AAC KATE, AAC LILA, SONATA, PUGET CRIMSON, FLORIDA PEARL, K09-4, K12-12, K14-4, K15-11, K16-21, K18-21, RG28-6-18.

Raspberry

Fifteen raspberry varieties were evaluated in 2020-2022. In general, the varieties with potential were:

PROVINCE	VARIETY	CHARACTERISTICS			
		Season	Harvest	Yield	Fruit Size
Quebec	K14-03	Floriscane	8 weeks	2.6 kg / m row	3.1 g
	AAC EDEN	Floriscane	9 weeks	2.1 kg / m row	3.9 g
	POLKA	Primocane	15 weeks	3.7 kg / m row	2.4 g
	K14-19	Primocane	15 weeks	2.6 kg / m row	2.9 g
Nova Scotia	NOVA	Floriscane	3 weeks	700 g / plant	2.5 g
	KILLARNEY	Floriscane	4 weeks	900 g / plant	2.6 g
	POLKA	Primocane	10 weeks	800 g / plant	3.2 g
	K14-13	Primocane	10 weeks	600 g / plant	3.5 g
Ontario	-	<i>Results were not conclusive due to poor establishment of variety trials in Ontario. No recommendations can be made at this time.</i>			
British Columbia (on-farm trials)	BC 10-71-27	Floriscane	Early	TBD in 2023	
	BC 10-79-33	Floriscane	Mid-Late	TBD in 2023	
	BC 1653.7	Floriscane	Mid-Early	TBD in 2023	
	BC 1613.46	Floriscane	Mid-Early	TBD in 2023	
	BC 1855.11	Floriscane	Mid-Late	TBD in 2023	
	BC 1855.14	Floriscane	Mid	TBD in 2023	
	BC 1543.53	Floriscane	Mid-Late	TBD in 2023	
	BC 15-53-15	Floriscane	Mid	TBD in 2023	
	BC 15-53-3	Floriscane	Mid	TBD in 2023	
	BC 10-84-9	Floriscane	Mid-Early	TBD in 2023	

There were no new raspberry varieties planted in 2022.

Blueberry

Seventeen blueberry varieties were planted in 2022 to be evaluated under the next CBTN. They are:

VARIETY	ORIGIN
<i>Early</i>	
PATRIOT	Maine, 1957
DUKE	New Jersey, 1987
TITANIUM	Oregon Blueberry Farm, 2013
PEACHYBLUE	Fall Creek Farm and Nursery, 2020
ARABELLABLUE	Fall Creek Farm and Nursery, 2020
<i>Mid-Season</i>	
BLUECROP	New Jersey, 1952
DRAPER	Michigan State University, 2003
CALYPSO	Michigan State University, 2013
OSORNO	Michigan State University, 2013
VALOR	Fall Creek Farm and Nursery, 2016
LORETOBLUE	Fall Creek Farm and Nursery, 2020
MEGASBLUE	Oregon Blueberry Farm, 2014
<i>Late</i>	
AURORA	Michigan State University, 2003
LUNABLUE	Fall Creek Farm and Nursery, 2020
<i>Unreleased</i>	
BC 12-6-8	British Columbia (M. Dossett)
BC 14-8-76	British Columbia (M. Dossett)
BC 14-42-174 (BC only)	British Columbia (M. Dossett)

BC 14-42-106 (BC only)	British Columbia (M. Dossett)
BC 14-42-270 (BC only)	British Columbia (M. Dossett)
BC 14-45-18 (BC only)	British Columbia (M. Dossett)
BC 14-45-79 (BC only)	British Columbia (M. Dossett)
BC 14-54-7 (BC only)	British Columbia (M. Dossett)
BC 1613.10 (BC only)	British Columbia (M. Dossett)
BC 1638.20 (BC only)	British Columbia (M. Dossett)
BC 1638.29 (BC only)	British Columbia (M. Dossett)
BC 1638.38 (BC only)	British Columbia (M. Dossett)
BC 1638.39 (BC only)	British Columbia (M. Dossett)
ORUS 264-1	US Department of Agriculture / Oregon State University (C. Finn)
ORUS 292-2	US Department of Agriculture / Oregon State University (C. Finn)

British Columbia On-Farm Trials

Evaluation of blueberry, raspberry and strawberry variety performance was performed via a combination of replicated yield trials on research sites and unreplicated observational blocks at grower sites from 2019-2023. Over the course of CAP, 24 June-bearing ([DARSELECT](#), [JEWEL](#), [CAVENDISH](#), [SUMMER DAISY](#), [AAC LILA](#), [AAC AUDREY](#), [AAC EVELYN](#), [AAC KATE](#), [VALLEY SUNSET](#), [WENDY](#), [SONATA](#), [SUMMER EVENING](#), [FLORIDA BRILLIANCE](#), [PUGET CRIMSON](#), [RG 28-6-18](#), [K04-12](#), [K04-21](#), [K12-12](#), [K12-14](#), [K16-21](#), [K15-11](#), [K18-21](#), [K09-4](#), and [K14-4](#)) and 13 day-neutral ([ALBION](#), [SEASCAPE](#), [CABRILLO](#), [AAC DYNAMIK](#), [MURANO](#), [SHANNON M KENT](#), [FLORIDA BEAUTY](#), [SALMA](#), [UCD FINN](#), [UCD MOJO](#), [BC 10-2-1](#), [K16-31](#), [K17-08](#)) strawberry varieties and selections were evaluated either in replicated trials, unreplicated trials, or both. Despite evaluating a very large number of new strawberry varieties and selections over the course of CAP, only [UCD VICTOR](#) and [UCD WARRIOR](#) showed any promise as June-bearers in BC; for day-neutrals, [BC 10-2-1](#) continued to perform the best in both replicated and unreplicated trials while [SALMA](#) showed some potential based on fall fruit quality in the establishment year (2022), but a full evaluation of this variety's potential will not occur until the 2023 season.

For raspberry, newly released Washington State University (WSU) variety, [CASCADE PREMIER](#), as well as another selection from the same program, [WSU 2188](#), performed well under commercial farms in BC. [WSU 2068](#) and [WSU 2069](#) were also evaluated on farm but did not perform as well as the other WSU genotypes. Via a combination of replicated and unreplicated trials, 17 floricanne fruiting ([NOVA](#), [KILLARNEY](#), [TULAMEEN](#), [MEEKER](#), [CHEMAINUS](#), [AAC EDEN](#), [K14-03](#), [K14-04](#), [BC 10-84-9](#), [BC 10-71-27](#), [BC 10-79-33](#), [BC 1653.7](#), [BC 1613.46](#), [BC 1855.14](#), [BC 1855.11](#), [BC 15-53-15](#), and [BC 15-53-3](#)) and 5 primocane fruiting ([HERITAGE](#), [K14-09](#), [K14-14](#), [K14-14](#), [K14-19](#)) raspberry varieties and selections were evaluated. Large-scale commercial plantings of the BC selections listed above were established on commercial farms in 2022 and will undergo first evaluations in 2023.

On-farm blueberry evaluations included varieties from Fall Creek Farm and Nursery ([CARGO](#), [LAST CALL](#), [TOP SHELF](#), [CLOCKWORK](#), [BLUE RIBBON](#), and [VALOR](#)) and Michigan State University ([CALYPSO](#), and [OSORNO](#)). Via a combination of replicated and unreplicated trials, selections from the BC breeding program ([BC 14-40-158](#), [BC 14-40-117](#), [BC 12-6-35](#), [BC 14-42-1](#), [BC 14-42-47](#), [BC 14-58-187](#), [BC 14-58-265](#), [BC 14-42-174](#), [BC 14-42-106](#), [BC 14-42-270](#), [BC 14-45-18](#), [BC 14-45-79](#), [BC 14-54-7](#), [BC 1613.10](#), [BC 1638.20](#), [BC 1638.29](#), [BC 1638.38](#), and [BC 1638.39](#)) and the University of Arkansas breeding program (A246B, A12) were evaluated. Large-scale plantings of three BC breeding program selections ([BC 14-40-158](#), [BC 14-40-117](#), and [BC 18-18-154](#)) were established on commercial farms in 2022 based on superior performance in previous trials. For the majority of the varieties and breeding selections listed above, intensive evaluation of fruit quality during cooler storage was conducted from 2019-2021.

Key Message(s):

The Canadian Berry Trial Network was successfully established during the 2018-2023 project cycle. The role of the CBTN is to evaluate new and upcoming varieties of strawberry, raspberry, and blueberry in BC, ON, QC, and NS. The network was created in 2018, and the first trials were planted in 2019. Almost sixty varieties in total were planted during the first project cycle. Strawberry and raspberry trials were harvested over three field seasons. A yield stability analysis was performed to identify varieties with consistent performance across variable climates. The results showed that there are some new strawberry varieties that are worth considering for commercial production, but that several established varieties of strawberry and raspberry are still reliable choices. A summary of these results can be viewed in the

presentation materials from grower meetings attended in 2022-2023, accessible [here](#). Blueberry trials were established in 2022, and evaluation is ongoing. The CBTN is set to begin its second project cycle in 2023-2024. The goal for the CBTN II (2023-2028) is to once again perform strawberry, raspberry, and blueberry variety trials in the four partner provinces. We thank our collaborators for their valued input and support, in particular the grower associations who have contributed funding to this research.

Overall benefit to industry:

The Canadian Berry Trial Network was successfully established during the 2018-2023 project cycle. The network includes berry genetics and production researchers who are advised by berry specialists and industry association representatives in British Columbia, Ontario, Quebec, and Nova Scotia. The role of the CBTN is to evaluate new and upcoming varieties of strawberry, raspberry, and blueberry in each of the four provinces. The network was formed in 2018, and the first trials were planted in 2019. Almost sixty varieties in total were planted during the first project cycle. Strawberry and raspberry trials were harvested over three field seasons, while blueberry trials were established in the final project year. This network will continue through 2023-2028, pending approvals from the Sustainable Canadian Agricultural Partnership. We sincerely thank our collaborators for their valued input and support, in particular the grower associations who have contributed funding to this research. We also thank the Fruit and Vegetable Growers of Canada for coordinating the Horticulture Clusters.

Performing objective, science-informed variety trials is challenging but valuable. Our trials have included industry standard varieties, new cultivars from international breeding programs, and new selections from Canadian breeding programs. These side-by-side comparisons have shown us that new varieties are not always competitive against established cultivars. For example, JEWEL and CAVENDISH were among the highest yielding varieties in the June-bearing strawberry trials. Similarly, POLKA and NOVA were among the highest yielding florican and primocane raspberries, respectively. These results suggest that growers can be confident in returning to standard varieties that are tried and true. However, some new releases have merit, and we encourage growers to test these varieties in their own production systems. For example, the new day-neutral strawberries AAC DYNAMIK and BC 10-2-1 were found to have competitive yields and fruit quality attributes compared with the industry standards ALBION and SEASCAPE. Varieties to consider for each province and crop type are listed under the 'Results and Progress' section.

Our results have also shown that there can be large differences in which variety wins where from one year to the next. As such, we performed analyses to identify varieties with stable yields across years and locations. For example, the day-neutral strawberries AAC DYNAMIK, BC 10-2-1, K16-31 DN, and SEASCAPE had either average or above-average yields over at least two years and three locations. The results of these analyses were summarized and presented at a number of grower events during 2022-2023. The presentation materials are available in the CBTN Google Drive, accessible [here](#). We encourage growers to consider trying out some of the varieties listed in the linked presentations and the 'Results and Progress' section, as these have shown some level of climate adaptability.

This project identified four numbered strawberry selections that may have commercial potential. They are the day-neutral strawberries BC 10-2-1 and K16-31 DN, as well as the June-bearing strawberries K16-21 and K14-04 (aka K14-4). These varieties were found to have generally competitive yields and favourable fruit quality attributes in the Eastern provinces. Test plants of these varieties are now available from commercial nurseries in Canada. We encourage growers to take advantage of this testing opportunity and determine whether any of these varieties will be suited to your specific production systems. Please contact Beatrice Amyotte if you are interested to know more.

The second CBTN project cycle will be initiated in 2023-2024. The CBTN II will first focus on evaluating the establishment, adaptation, and productivity of the highbush blueberry trials planted in 2022. We will also evaluate the existing raspberry and strawberry trials for one more season. Next, we will plant new trials of strawberry and raspberry to evaluate the newest varieties and test selections from Canadian and international breeding programs. We will once again strive to deliver results to you, our stakeholders, in several different ways. We will host in-person visits of our field trials, give virtual update presentations, and attend grower meetings in each province. We will continue to post presentation materials in our [CBTN Google Drive](#) and be available by phone or email to answer your questions.

Please contact us for any questions you have about the CBTN I or CBTN II, or if you'd like to schedule a field tour:

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