Project Title: Identification of High Bush Blueberry Cultivars Suitable for Juice Production in NS

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Final Report

Applicant: Horticulture Nova Scotia, Blair House, Kentville Agricultural Center, Kentville, B4N 1J5

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Identification of High Bush Blueberry Cultivars Suitable for Juice Production in Nova Scotia

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Kim Best, Project Leader

ABSTRACT

A field trial including nine cultivars of highbush blueberry continued in 2015 to identify suitable cultivars for the juice market. This trial was planted by the cooperating grower in 2011 and studied by researchers for 4 years from 2012-2015. In addition to the comparison of the blueberry cultivars, cover crops that were established in 2012 were evaluated. In each season, the blueberry cultivars were harvested with yield and quality data collected. 'Draper', 'Elizabeth', 'Bluecrop', and 'Arlen' were the top yielding cultivars over the first three seasons. 'Draper', 'Superior', 'Bluecrop' and 'Jersey' were the top yielding in 2015. After a stressful establishment year, the plants had become more mature by the fourth season and thus yield dramatically improved over that from years 1 and 2 of the trial. Berries were pressed for juice in each of four seasons. Results were variable in 2012 which was thought to be related to the stressful, dry growing conditions. Juice production and quality improved in 2013 with increased juice yield of 10% on average across cultivars. Similar results were obtained in 2014 and 2015.

Project Objectives: To evaluate cultivars of highbush blueberries, particularly those which have not been grown in Nova Scotia in the past; to determine cultivars that would meet the quality requirements of the juice market and produce a suitable plant and berry for mechanically harvesting; to evaluate cover crop mixes suitable for in between rows in highbush blueberry plantings.

Materials and Methods: Two year old plants were transplanted by Dykeview Farms in the fall of 2011 as an in-kind contribution to this trial to enable harvesting the following and subsequent years on this trial. Cover crops were established between the rows of blueberry cultivars in 2012. Plots were harvested from 2012-2015, with the most significant yield produced in 2015. Cover crop evaluation and harvest, observational blueberry plant growth and habit data and fruit harvest data was collected each growing season.

Results and Discussion:

2012

The plants in this trial were established within a commercial blueberry planting at Dykeview Farms. The plants in the plot were allowed to fruit in the summer after planting which is not the standard practice on this farm in order to have some yield from the trial. However, not all plants were established well enough to produce much, if any fruit. Some plots were harvested between

August 8 and 29, 2012 with yield and quality data collected. ‘Bluecrop’ produced the highest yield. ‘Draper’ and ‘Bluejay’ produced moderate yields. Quality was average or better. Fruit samples from the plots were pressed for juice to determine recovery and attributes suitable for juice quality. As such small samples were available to press, this data may not be representative of the cultivar at maturity. 2012 was a warm summer with drier conditions than most recent years and although irrigation was provided, plant stress was evident. 2012 data tables are attached.

2013

The cover crops planted between the rows of blueberries filled in well in 2013. Samples were harvested to determine plant growth and tonnage as a representation of maintenance requirements such as mowing and whippersnipping. Three samples were collected from various replicates of the cover crop and averaged for kilogram of wet weight per metre square. Sub-samples were dried to determine dry matter content of the cover crops. The clover mixes produced the largest volume of plant material and could require increased maintenance. The grass mixes had a higher dry matter content as expected and were for the most part lower growing and required less maintenance. Blueberry plant stand, plants heaved by frost, presence of new shoot growth and plant height were measured prior to harvest. An observational rating for fruit load per plant and the suitability of the plant for mechanically harvesting was also collected at this time. Plant stand was high for most cultivars with the exception of ‘Superior’ which was the lowest at 79.5% resulting from poor plant establishment and stressful growing conditions in 2012. This cultivar suffered the most frost heaving and is one of the shortest groups of plants in the trial. It did however, have a suitable plant shape for mechanical harvest. Fruit harvest began July 30 for earlier cultivars and continued to September 26 for the latest cultivars. As in 2012, fruit samples from the plots were pressed for juice to determine recovery and attributes suitable for juice quality. Results were improved over 2012 with more juice recovered from the berries and the Brix/TA ratio becoming closer to expected results for some cultivars. 2013 data tables are attached.

2014

Plants were much better established in 2014 and in general, the mean yield improved by almost six times that from 2013. In 2012 and 2013, the plants were not pruned so as to have fruit to harvest for the trial, which is not the typical farm practice. In 2014, with 2 additional years of funding secured, plants were pruned by professional farm workers which greatly improved plant structure. This was expected to improve fruit set in 2015 as well. As in previous seasons, harvest was completed with yield and quality data collected as well as observational data collection on plant growth and habit. Early cultivar harvest began July 31 with later cultivars harvested until October 16. Due to the significant increase in yield in 2014, these data were not combined with 2012 and 2013 yield data. Overall, ‘Draper’, ‘Elizabeth’, ‘Bluecrop’ and ‘Arlen’ produced the highest yield. The average fruit size and weight were greater in 2014 as indicated by the mean weight and diameters of the largest and smallest berries. In the previous seasons, not enough yield was collected from some cultivars for pressing for juice. All cultivars had adequate samples for the juice evaluation in 2014. The Brix/TA ratio also improved in 2014 and was in the expected range on average, with a few cultivars still below. Samples from the cover crops were collected twice in 2015, June 3 and July 22 with two overall mowings between the rows

completed at this same time. This appeared adequate for growth control for all plots even though the clover mix plots continued to produce a much heavier forage crop. 2014 data tables are attached.

2015

Plants were becoming well established in 2015 and overall the mean yield improved by almost five times that from 2014. As in previous seasons, harvest was completed with yield and quality data collected as well as observational data collection on plant growth and habit. Early cultivar harvest began August 13 with later cultivars harvested until October 13. On August 26, 'Jersey', 'Bluecrop', 'Bluejay' and 'Draper' were mechanically harvested to evaluate fruit and plant quality in the system. No reduction in berry quality or visible stress to plants was observed. Due to the significant increase in yield again in 2015, annual data were not combined. Figure 1, attached, demonstrates the increase in yield of cultivars over the course of the trial and how some cultivars establish and produce more quickly than others. The average fruit size and weight were smaller in 2015 as indicated by the mean weight and diameters of the largest and smallest berries. This could be accounted for by the increased fruit set and yield in 2015. 'Draper', 'Superior', 'Bluecrop' and 'Jersey' produced the highest yield in 2015. This is despite 'Superior' having the lowest plant stand in the trial. Unfortunately, a good amount of the fruit from the 'Arlen' plots was harvested in error by the farm crew, thus reducing the yield. The Brix/TA ratio was not as good on average as in 2014. Most cultivars were either well above or well below the goal ratio of 17-25. Samples from the cover crops were collected twice in 2015, June 15 and August 17 with two overall mowings between the rows completed at this same time. This appeared adequate for growth control for all plots. It was observed that some clover had migrated by self seeding into grass only plots. These areas were avoided for cover crop sample collection. The average marketable blueberry fruit yield from plants within a cover crop treatment was calculated. C3, which included 50% common white clover, produced a much higher blueberry yield than the other treatments. Fruit yield was 35% more than the average of all treatments. This was followed by C2, which included 20% Huia white clover. All of the grass mixes produced similar yields of blueberries while C1, which included 20% common white clover, produced the lowest fresh blueberry yield. 2015 data tables are attached.

Conclusions and Summary: Nine cultivars of highbush blueberries planted in 2011 were evaluated over four seasons. Six cover crop mixes were established in 2012 and evaluated in subsequent seasons. Blueberry harvest data was collected over the four seasons with yield and quality evaluated. 'Draper', 'Superior', 'Bluecrop' and 'Jersey' produced the highest yield in 2015. Unfortunately, in 2015, 'Arlen' was harvested in error by the farm crew which reduced the trial yield. 'Draper', 'Elizabeth', 'Bluecrop' and 'Arlen' produced the most yield over the previous three year seasons. Samples of berries from the trial were pressed for juice. Results from 2012 were extremely variable and thought to be effected by plant stress caused by drought conditions. The results from 2013 were improved, although most cultivars had not yet achieved the expected results. The yield of juice from the fruit improved by 10% on average from 2012 to 2013. 2014 and 2015 juice results are more in line with expected results as plants have become more mature and better established with a significant yield improvement. Blueberry plant growth was evaluated over the 4 years of the trial for suitability for mechanical harvest. 'Chanticlear'

and ‘Superior’ appeared to be the most naturally suited to mechanical harvest with upright plant growth, however, ‘Chanticlear’ had not produced significant yield to date. ‘Superior’ plot yields improved from 2013 to 2015 with a significant yield increase in 2015 despite having the poorest plant stand in the trial. A number of other cultivars appeared to have acceptable plant growth to this point and performed well in terms of yield and quality. The natural plant habit of ‘Elizabeth’, ‘Bluecrop’ and ‘Arlen’ are not the most suitable for mechanical harvesting although this may be improved with pruning and training.‘Draper’ had the highest fresh fruit and juice yield and plant stand but a less desirable plant habit for mechanical harvest. The cover crop treatment C3, which included 50% common white clover, produced a much higher yield of marketable blueberries than the other treatments. In 2013 and 2014, the tonnage of forage crop produced by the clover mixes was much higher than the grass mixes although no additional maintenance was required. Forage yield was more similar among treatments in 2015. All treatments were observed to hold up well to foot traffic.

Executive Summary: Horticulture Nova Scotia continued to conduct a field trial including nine cultivars of highbush blueberry in 2015 to identify suitable cultivars for the juice market. This trial was planted in 2011 and studied for 3 years in 2012, 2013 and 2014. In addition to the comparison of the blueberry cultivars, cover crops that were established in 2012 where evaluated. In each season, the blueberry cultivars were harvested with yield and quality data collected. ‘Draper’, ‘Elizabeth’,‘Bluecrop’, and ‘Arlen’ were the top yielding cultivars over the first three seasons. ‘Draper’, ‘Superior’, ‘Bluecrop’ and ‘Jersey’ produced the highest yield in 2015. Unfortunately, in 2015, ‘Arlen’ was harvested in error by the farm crew which reduced the trial yield. Berries were pressed for juice in each of four seasons. Results were variable in 2012 which was thought to be related to the stressful, dry growing conditions. Results were improved in 2013 with increased juice yield of 10% on average across cultivars. Similar results were obtained in 2014 and again in 2015. The natural plant habit of ‘Elizabeth’, ‘Bluecrop’ and ‘Arlen’ are not the most suitable for mechanical harvesting although this may be improved with pruning and training.‘Draper’ had the highest fresh fruit and juice yield and plant stand but a less desirable plant habit for mechanical harvest. The cover crop treatment C3, which included 50% common white clover, produced a much higher yield of marketable blueberries than the other treatments.

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Table 1. Blueberry cultivar trial - yield and plant characteristics, 2015

Cultivar	Yield kg/ha	Yield lb/acre	Weight of largest berry (g)	Diameter of largest berry (mm)	Weight of smallest berry (g)	Diameter of smallest berry (mm)	Brix	Number of berries /pint
Draper	12674	11279	3.8	18.8	1.4	11.9	11.8	161
Superior	11672	10388	2.1	14.9	0.7	8.7	11.5	324
Bluecrop	9266	8246	3.0	17.3	1.1	10.3	13.0	236
Jersey	6896	6137	2.1	14.8	0.7	7.9	13.5	346
Elizabeth	6876	6120	2.2	16.7	0.8	10.8	14.5	239
Bluejay	5375	4784	2.6	15.9	1.4	8.7	13.4	223
Ozark Blue	3942	3508	3.1	19.1	0.9	11.5	12.8	215
Arlen	2380	2118	2.6	16.1	1.0	8.8	11.7	245
Chanticlear	1724	1534	2.8	17.0	0.7	8.5	11.3	173
Grand Mean	**6756**	**6012.8**	**2.69**	**16.72**	**0.96**	**9.65**	**12.62**	**240.1**

Table 2. Blueberry cultivar trial - Results from Juice Press, 2015

Cultivar	pH	Brix	TA	Brix/TA ratio +	% Yield (corrected for loss)
Draper	3.3	11.9	1	11.8	76.7
Superior	3.2	11.2	0.9	13	72.7
Bluecrop	3.4	11.6	0.9	13.6	73.9
Jersey	3.9	14.4	0.4	41.1	74.1
Elizabeth	3.2	13.5	1.2	11.5	66.7
Bluejay	3.6	13.9	0.6	23.5	73.4
Ozark Blue	3.1	13.3	0.9	14.1	69.9
Arlen	3.4	13	0.8	15.9	67.8
Chanticlear	3.8	11.4	0.3	36	77.5
Grand Mean	**3.44**	**12.67**	**0.77**	**16.52**	**72.52**

+Expected Brix/ TA ratio was 17-25

Table 3. Blueberry cultivar trial - quality, 2015

	Attribute Ratings[z]									
Cultivar	Fruit appear -ance	Calyx quality	Firm -ness	Bruis- ing	Durability of bloom	Colour	Flav- our	Text- ure	Size of stem scar	Overall quality
Draper	4	3	4	4	4	4	3	4	3	4
Superior	3	4	3	3	3	3	3	3	4	3
Bluecrop	3	3	4	4	3	4	4	4	4	4
Jersey	3	3	3	4	3	3	3	3	4	3
Elizabeth	3	3	3	3	3	4	3	3	3	3
Bluejay	4	3	3	4	3	3	3	3	3	3
Ozark Blue	4	3	4	4	3	4	3	4	4	4
Arlen	3	4	3	3	3	3	3	3	4	3
Chanticlear	3	3	2	3	3	3	3	2	3	3
Grand Mean	**3.3**	**3.3**	**3.1**	**3.5**	**3.1**	**3.4**	**3.2**	**3.1**	**3.3**	**3.5**

[z]Ratings of 1 - 5 with 5 = most desirable and 3 = average

Table 4. Blueberry cultivar trial - Cover crop harvest samples, 2015

Cover crop	Mix	Yield kg/m2 (at harvest)	% Dry Matter
C1	Scotian Gold Common Clover	0.6	28.7
C2	Huia Clover Mix	0.6	26.5
C3	Scotian Gold 50% Clover Mix	0.5	26.8
G1	Quality Seed Mix	0.5	39.2
G2	Scotian Gold Grass Mix	0.5	36.5
G3	Canada Green Mix	0.4	34.7
Grand Mean		**0.52**	**32.05**

Scotian Gold is a local forage seed supplier.

Table 5. Blueberry cultivar trial- yield and plant characteristics by cover crop, 2015

Cover crop	Yield kg/ha	Yield lb/acre	Weight of largest berry (g)	Diameter of largest berry (mm)	Weight of smallest berry (g)	Diameter of smallest berry (mm)	Brix	Number of berries/ pint
C3	9288	8266	2.8	17.3	1.4	10.3	13.1	250
C2	6504	5789	2.6	16.6	1	9.5	12.3	258
G2	6497	5782	2.9	16.1	0.9	9	11.8	230
G3	6469	5758	2.6	17.2	0.8	10	12.5	239
G1	6282	5591	2.7	16.8	0.8	9.6	12.6	245
C1	5495	4891	2.6	16.3	0.9	9.5	13.3	241
Grand Mean	**6756**	**6012.8**	**2.69**	**16.72**	**0.96**	**9.65**	**12.62**	**243.8**

Table 6. Blueberry cultivar trial - quality by cover crop, 2015

	Attribute Ratings[z]									
Cultivar	Fruit appear -ance	Calyx quality	Firm -ness	Bruis- ing	Durability of bloom	Colour	Flav- our	Text- ure	Size of stem scar	Overall quality
C3	3	3	3	4	3	4	3	3	3	4
C2	3	3	3	4	3	3	3	3	4	3
G2	3	3	3	3	3	3	3	3	4	3
G3	3	3	3	3	3	3	3	3	3	3
G1	3	3	3	4	3	4	3	3	4	3
C1	3	3	3	3	3	3	3	3	3	3
Grand Mean	**3.3**	**3.3**	**3.1**	**3.5**	**3.1**	**3.4**	**3.2**	**3.1**	**3.5**	**3.3**

[z]Ratings of 1 - 5 with 5 = most desirable and 3 = average

Table 7. Blueberry cultivar trial - Field measurements and observational data, 2015

Cultivar	% Stand	% Plants Frost Heaved	Plant Height (cm)	# New shoots/plant	Plant shape[z]
Draper	100	0	90	3.9	2
Superior	75	0	82	8.9	3
Bluecrop	100	0	114	1	3
Jersey	100	0	101	1.1	3
Elizabeth	100	0	125	0.8	3
Bluejay	96	0	97	3.5	3
Ozark Blue	71	0	115	1.4	3
Chanticlear	92	0	103	0.8	3
Arlen	96	20.8	118	0.3	3
Grand Mean	**92.1**	**2.31**	**104.90**	**2.40**	**2.9**

[z]Ratings of 1 - 5 with 5 = most desirable and 3 = average

Table 8. Blueberry cultivar trial - yield and plant characteristics, 2014

Cultivar	Yield kg/ha	Yield lb/acre	Weight of largest berry (g)	Diameter of largest berry (mm)	Weight of smallest berry (g)	Diameter of smallest berry (mm)	Brix
Draper	8334	7417	3.9	20.4	1.3	11.6	13.2
Elizabeth	4875	4339	2.5	17.1	1.1	11.2	15.0
Bluecrop	2461	2191	3.8	18.1	1.5	12.0	12.7
Arlen	2219	1975	2.7	17.9	1.1	11.5	12.4
Superior	2142	1906	3.1	18.3	1.2	11.5	12.4
Jersey	1712	1524	1.8	15.8	0.9	9.4	14.3
Bluejay	906	806	2.7	16.9	1.2	11.0	14.0
Chanticlear	340	303	3.4	19.8	1.4	12.9	13.4
Ozark Blue	284	253	3.6	18.8	1.8	12.6	12.5
Grand Mean	**2586**	**2301.6**	**3.05**	**18.13**	**1.28**	**11.51**	**13.33**

Table 9. Blueberry cultivar trial - Results from Juice Press, 2014

Cultivar	pH	Brix	TA	Brix/TA ratio +	% Yield (corrected for loss)
Draper	3.4	13.1	0.7	20	81.2
Elizabeth	3.4	15.6	1.3	12.6	69.2
Bluecrop	3.3	12.9	0.9	14.9	71.5
Arlen	3.2	12.7	1.2	12	75.2
Superior	3.3	13.3	0.9	15.1	80.5
Jersey	3.6	16.4	0.7	23.4	66.9
Bluejay	3.5	14.4	0.7	19.7	76.3
Chanticlear	3.8	13.8	0.4	36.2	77.1
Ozark Blue	3.1	13.5	1.2	11.7	74.1
Grand Mean	**3.41**	**13.96**	**0.87**	**18.40**	**74.67**

+Expected Brix/ TA ratio was 17-25

Table 10. Blueberry cultivar trial - quality, 2014

	Attribute Ratings[z]									
Cultivar	Fruit appear -ance	Calyx quality	Firm -ness	Bruis- ing	Durability of bloom	Colour	Flav- our	Text- ure	Size of stem scar	Overall quality
Draper	4	4	4	4	3	4	4	4	3	4
Elizabeth	3	3	3	3	3	3	4	3	3	3
Bluecrop	3	3	4	3	3	4	4	4	3	4
Arlen	4	4	4	4	3	4	4	4	4	4
Superior	3	3	3	3	3	3	4	3	3	3
Jersey	3	3	4	3	3	3	4	3	4	3
Bluejay	4	4	4	3	3	4	4	3	3	4
Chanticlear	3	3	3	3	3	3	3	3	3	3
Ozark Blue	4	3	4	4	3	4	4	4	3	4
Grand Mean	**3.4**	**3.3**	**3.6**	**3.5**	**3.2**	**3.4**	**3.7**	**3.5**	**3.3**	**3.4**

[z]Ratings of 1 - 5 with 5 = most desirable and 3 = average

Table 11. Blueberry cultivar trial - Cover crop harvest samples, 2014

Cover crop	Mix	Yield kg/m2 (at harvest)	% Dry Matter
C1	Scotian Gold Common Clover	1.1	21.3
C2	Huia Clover Mix	1.4	18.2
C3	Scotian Gold 50% Clover Mix	1.3	18
G1	Quality Seed Mix	0.3	30.9
G2	Scotian Gold Grass Mix	0.2	31.7
G3	Canada Green Mix	0.2	34.4
Grand Mean		**0.70**	**25.70**

Scotian Gold is a local forage seed supplier.

Table 12. Blueberry cultivar trial - Field measurements and observational data, 2014

Cultivar	% Stand	% Plants Frost Heaved	Plant Height (cm)	# New shoots/plant	Plant shape[z]
Draper	100	8.3	91	2.2	2
Elizabeth	100	0	114	0.8	3
Bluecrop	100	0	104	0.6	3
Arlen	100	4.2	105	0.1	3
Superior	75	0	75	4.8	3
Jersey	100	0	94	0.9	3
Bluejay	96	45.8	180	2.2	3
Chanticlear	92	0	96	0.8	4
Ozark Blue	83	4.2	101	0.8	3
Grand Mean	**94.0**	**6.90**	**106.70**	**1.50**	**2.9**

[z]Ratings of 1 - 5 with 5 = most desirable and 3 = average

Table 13. Blueberry Cover Crop Seed Mixes

Code	Cover Crop Mix	Components
C1	Scotian Gold Common Clover Mix	20 % Common White Clover 8 % Royal Kentucky Blue 20 % Fiesta 4 Perennial Rye 16 % Windward Clewing Fescue 16 % Crossbow Creeping Red 20 % Transist Intermediate Rye
C2	Huia Clover Mix	20 % Huia White Clover 8 % Royal Kentucky Blue 20 % Fiesta 4 Perennial Rye 16 % Windward Clewings Fescue 16 % Crossbow Creeping Red 20 % Transist Intermediate Rye
C3	Scotian Gold 50% Clover Mix	50 % Common White Clover 5 % Royal Kentucky Blue 10 % Windward Clewing Fescue 10 % Crossbow Creeping Red 25 % Transist Intermediate Rye
G1	Quality Seed Mix	20 % Primary Perennial Ryegrass 20 % Rhino Hard Fescue 20 % Jamestown IV Clewing Fescue 10 % Sitka Tall Fescue 30 % Corsair Kentucky Bluegrass
G2	Scotian Gold Grass Mix	10 % Royal Kentucky Blue 25 % Fiesta 4 Perennial Rye 20 % Windward Clewings Fescue 20 % Crossbow Creeping Red 25 % Transist Intermediate Rye
G3	Canada Green Mix	40 % Creeping Red Fescue 20 % Kentucky Bluegrass 20 % Perennial Ryegrass 20 % Annual Ryegrass

C= Clover; G=Grass

Table 14. Blueberry cultivar trial - yield and plant characteristics, 2013

Cultivar	Yield kg/ha	Yield lb/acre	Weight of largest berry (g)	Diameter of largest berry (mm)	Weight of smallest berry (g)	Diameter of smallest berry (mm)	Brix
Bluecrop	941	837	2.9	19.0	1.3	12.9	14.4
Draper	916	815	3.5	20.4	1.5	14.0	13.9
Arlen	745	663	2.8	18.3	1.3	13.2	13.2
Elizabeth	636	566	3.0	18.4	2.2	11.5	13.2
Jersey	340	303	1.8	15.0	1.3	11.5	14.0
Superior	153	136	2.0	16.3	1.0	11.1	11.5
Chanticlear	114	102	3.0	17.8	1.0	11.5	12.0
Ozark Blue	66	58	3.6	18.0	2.2	14.0	14.0
Bluejay	8	7	2.0	16.0	1.0	13.0	14.0
Grand Mean	**435**	**387**	**2.73**	**17.68**	**1.42**	**12.52**	**13.35**

Table 15. Blueberry cultivar trial - Results from Juice Press, 2013

Cultivar	pH	Brix	TA	Brix/TA ratio +	% Yield (corrected for loss)
Bluecrop	2.9	13.7	1.36	10.1	80
Draper	2.8	15.1	1.38	10.9	81
Arlen	2.7	13.7	1.6	8.6	80.4
Elizabeth	2.8	14.1	2.0	7.1	78.6
Jersey	3.2	14.3	0.8	17.9	75.8
Superior	2.9	12.9	1.51	8.5	N/A
Chanticlear	3.5	13	0.5	26	78.2
Ozark Blue	2.8	12.4	1.31	9.5	N/A
Bluejay	3.0	15.2	1.21	12.6	N/A
Grand Mean	**2.96**	**13.82**	**1.29**	**12.36**	**79.00**

N/A = Not enough berries for analysis
+Expected Brix/ TA ratio was 17-25

Table 16. Blueberry cultivar trial - quality, 2013

	Attribute Ratings[z]									
Cultivar	Fruit appear -ance	Calyx quality	Firm -ness	Bruis- ing	Durability of bloom	Colour	Flav- our	Text- ure	Size of stem scar	Overall quality
Bluecrop	4	4	3	4	4	4	4	3	2	4
Draper	4	4	4	4	4	4	4	4	2	4
Arlen	4	3	4	4	4	4	3	3	4	4
Elizabeth	3	2	4	4	3	4	3	3	2	3
Jersey	4	3	3	4	3	4	4	3	3	4
Superior	3	3	3	4	4	4	3	3	3	3
Chanticlear	3	3	3	4	3	4	4	3	4	3
Ozark Blue	3	2	3	5	4	4	3	3	2	3
Bluejay	3	4	4	4	3	4	3	4	4	4
Grand Mean	**3.4**	**3.1**	**3.4**	**4.1**	**3.5**	**4**	**3.4**	**3.2**	**2.8**	**3.5**

[z]Ratings of 1 - 5 with 5 = most desirable and 3 = average

Table 17. Blueberry cultivar trial - Cover crop harvest samples, 2013

Cover crop	Mix	Yield kg/m2 (at harvest)	% Dry Matter
C1	Scotian Gold Common Clover	5.7	27.8
C2	Huia Clover Mix	5.6	18.7
C3	Scotian Gold 50% Clover Mix	5.6	23.2
G1	Quality Seed Mix	1	41.7
G2	Scotian Gold Grass Mix	1.4	31.8
G3	Canada Green Mix	1.7	31.6
Grand Mean		**3.50**	**29.13**

Scotian Gold is a local forage seed supplier.

Table 18. Blueberry cultivar trial - Field measurements and observational data, 2013

Cultivar	% Stand	% Plants Frost Heaved	Plant Height (cm)	# New shoots/plant	Fruit Load[z]	Plant shape[z]
Jersey	100	12.5	77	0	1.3	3
Bluecrop	96	4.3	95	0.3	1.5	3
Bluejay	96	30.4	73	1.4	0.1	3
Ozark Blue	83	35	77	0.3	0.5	3
Draper	100	12.5	90	0.4	0.4	1
Chanticlear	92	13.6	74	0.5	0.6	4
Elizabeth	100	4.2	88	0.7	1.4	2
Superior	79.5	31.6	55	0.5	1.2	4
Arlen	100	29.2	95	0.6	1.3	2
Grand Mean	**94.0**	**19.25**	**80.23**	**0.52**	**0.92**	**2.8**

[z]Ratings of 1 - 5 with 5 = most desirable and 3 = average

Table 19. Blueberry cultivar trial - yield and plant characteristics, 2012

Cultivar	Yield kg/ha	Yield lb/acre	Weight of largest berry (g)	Diameter of largest berry (mm)	Weight of smallest berry (g)	Diameter of smallest berry (mm)	Brix
Bluecrop	58	51	2	15	1	12	13.1
Draper	37	33	2	17	1	14	13.8
Bluejay	26	24	1	14	1	10	13.0
Superior	6	5	1	11	1	9	13.5
Ozark Blue	4	4	2	14	N/A	N/A	13.3
Arlen	4	3	1	13	1	13	12.0
Chanticlear	2	2	1	12	N/A	N/A	16.0
Grand Mean	**19.6**	**17.4**	**1.4**	**13.7**	**1.0**	**11.6**	**13.52**

N/A = Not enough berries for analysis

Table 20. Blueberry cultivar trial - Results from Juice Press, 2012

Cultivar	pH	Brix	TA	Brix/TA ratio +	% Yield (corrected for loss)
Bluecrop	3	15	1	11	66
Draper	3	16	1	14	76
Bluejay	3	16	1	20	59
Superior	N/A	N/A	N/A	N/A	N/A
Ozark Blue	3	12	2	7	71
Arlen	3	14	2	7	70
Chanticlear	3	13	1	9	73
Grand Mean	**3.0**	**14.3**	**1.3**	**11.3**	**69.2**

N/A = Not enough berries for analysis
+Expected Brix/ TA ratio was 17-25

Table 21. Blueberry cultivar trial - quality, 2012

	Attribute Ratings[z]									
Cultivar	Fruit appear -ance	Calyx quality	Firm -ness	Bruis- ing	Durability of bloom	Colour	Flav- our	Text- ure	Size of stem scar	Overall quality
Bluecrop	3	3	4	4	3	3	3	3	3	3
Draper	3	3	4	4	3	3	4	3	3	4
Bluejay	4	4	3	4	3	4	4	3	4	4
Superior	4	3	4	3	3	4	4	3	4	3
Ozark Blue	3	3	3	3	3	3	3	3	3	3
Arlen	3	3	3	4	3	3	4	3	4	3
Chanticlear	4	4	4	4	4	4	4	4	4	4
Grand Mean	**3.4**	**3.3**	**3.5**	**3.7**	**3.3**	**3.5**	**3.6**	**3.2**	**3.6**	**3.4**

[z]Ratings of 1 - 5 with 5 = most desirable and 3 = average

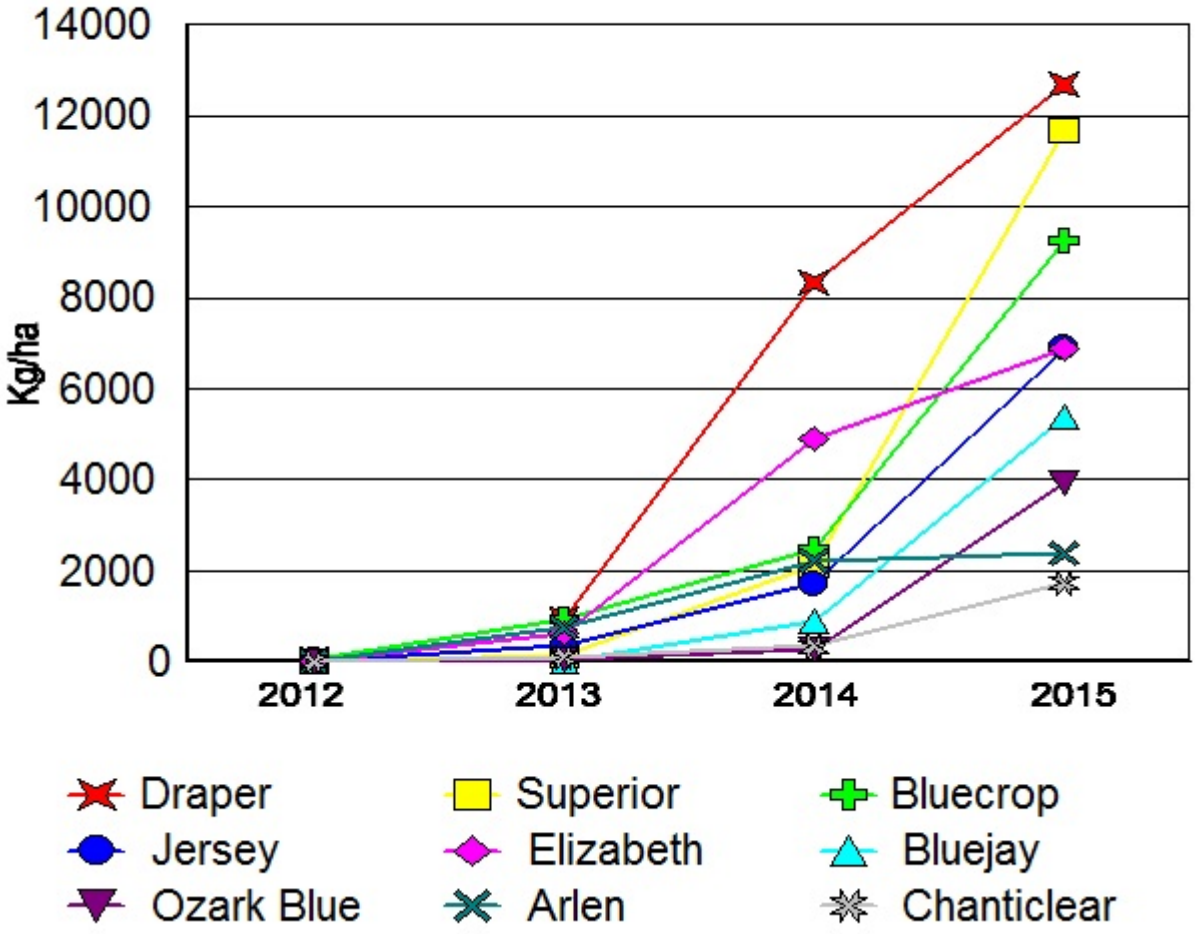

Figure 1: Production of blueberry cultivars over 4 seasons