

Results of Testing Highbush Blueberry Cultivars in The Netherlands

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Abstract

In March 1998, two-year old plants of 17 Highbush Blueberry cultivars were planted at the Experimental Station in Horst. The cultivars 'Earliblue', 'Blueray', 'Bluecrop', 'Coville' and 'Elliott' were planted as reference cultivars. The new tested cultivars were 'Nui', 'Puru', 'Reka', 'Sunrise', 'PBBB', 'Nelson', 'Toro', 'Sierra', 'Chandler', 'Bluegold', 'Caroline Blue' and 'Brigitta Blue'. Some of the cultivars were already planted in a demonstration field at the Experimental Station. As a result of this trial the cultivars 'Reka', 'Chandler' and 'Brigitta Blue' are recommended for commercial plantings in the open field. In this trial the bushes of 'Reka' were productive and the berries had a good shelf life. 'Chandler' (No. 139) was very productive and the average fruit size was very large. 'Brigitta Blue' was also very productive and the berries kept very well in storage. The cultivars 'Caroline Blue', 'Toro', 'Sunrise' and 'Nelson' are less suitable for commercial plantings. Although the fruit quality of 'Elliott' is less than other cultivars, it is still recommended because of the late ripening harvest. Maybe stored berries of 'Brigitta Blue' can beat the fresh berries of 'Elliott' because of the better fruit quality and shelf life for the fresh market. The other cultivars are not recommended because of poor production ('Earliblue', 'Nui', 'PBBB', 'Sierra' and 'Bluegold'), small fruit size ('Coville') or poor shelf life ('Puru', 'Blueray'). For advancing the harvest period in a Greenhouse or plastic Tunnel 'Nui' has proven in practice to be a recommendable cultivar. This was not tested in this trial.

INTRODUCTION

In 1923 Mr. Borgesius from Assen in the Netherlands imported the first Highbush Blueberry plants into Europe. Shortly after, in 1924, Mr. Heermann introduced the Highbush Blueberry into Germany. Sweden and Poland followed soon. Since then, researchers are testing Highbush Blueberry cultivars for the climate and culture in the Netherlands. The latest trial on testing new cultivars started in 1998 and ended in 2002, earlier than planned because of the closing of the Experimental Station in Horst. This was a result of the privatization and centralization of Horticultural research by the Dutch Government.

MATERIALS AND METHODS

In March 1998 a new trial for testing Highbush Blueberry cultivars for the climate and culture in the Netherlands, was set up with 2-year old plants of 17 different cultivars at the Experimental Station "Meterikse Veld" in Horst. The purpose of this trial was to find better and earlier or later ripening cultivars. As reference cultivars, the cultivars 'Earliblue', 'Blueray', 'Bluecrop', 'Coville' and 'Elliott' were planted. The new tested cultivars were 'Nui', 'Puru', 'Reka', 'Sunrise', 'PBBB', 'Nelson', 'Toro', 'Sierra', 'Chandler', 'Bluegold', 'Caroline Blue' and 'Brigitta Blue'. Some of the cultivars were already known, since they had already stood for a few years at a demonstration field at the Experimental Station.

The 2-year old plants were grown in 5 liter pots and planted in the sandy soil, pH 4,0 and rich of humus, in the open field at the Experimental Station. The trial was set up

in 3 repetitions of 4 plants. The plant space was 2,50 m x 0,95 m. This is a high density planting with approximately 4.210 plants per hectare.

In this trial the following characteristics were judged: fruit size, uniformity, taste, firmness, shelf life, storage, harvest period, growth of the plants, suitability for hand- and mechanical picking and the susceptibility to pests and diseases. The suitability for advancing the harvest period in greenhouses or plastic tunnels and for delaying the harvest period under raincovers was not tested in this trial.

RESULTS AND DISCUSSION

As a result of this trial, the following description of the new cultivars can be given for the climate and culture of the Netherlands. The cultivars 'Earliblue', 'Blueray', 'Bluecrop', 'Coville' and 'Elliott' were planted as reference cultivars and are not described below.

'Nui' ((Earliblue x Ashworth) x Bluecrop) (New Zealand, 1987)

Bush: Wide, flat, compact and bushy plants with good shoot growth and branching. Big, shiny leaves which stay on the plants until late in the autumn. Production is average.

Fruit: Nui means in the Maori language large. And that is the truth. The fruit size is very large and the taste good. Ripens equal to Earliblue.

Note: Although it was not tested in this trial, Nui is a recommendable cultivar for culture in a greenhouse or plastic tunnel. This recommendation is based on the good results at some commercial plantings indoors.

'Puru' ((Earliblue x Ashworth) x Bluecrop) (New Zealand, 1987)

Bush: Poor uprightiness; compact and bushy plants with moderate branching. Bears berries on small bold shoots inside the bush. Production is good.

Fruit: Large fruits with a good taste. After storage a poor shelf life. Ripens equal to Nui.

Note: In some years late blooming after the harvest.

'Reka' ((Earliblue x Ashworth) x Bluecrop) (New Zealand, 1987)

Bush: Rising shoots and strongly branching plants. Under the weight of berries branches easily hang out widely, even worse than Earliblue and Bluecrop. The plants produce extremely well.

Fruit: Average to large fruit size. Ripens a few days later than Earliblue.

Note: Some berries do not color blue and stay reddish because of the high production.

'Sunrise' (G-180 (G-100 (Ivanhoe x Earliblue) x Collins) x Me-US 6620 (E-22 (Earliblue x No.3 (North Sedgewick lowbush) x Earliblue)) x Me-US 24 (NH-1 (Coville x North Sedgewick lowbush) x Earliblue))) (USA, 1989)

Bush: Wide-growing, compact, bushy, low plant with not many leaves. Average production, less than Duke, Puru and Reka. Duke stood in an earlier trial.

Fruit: Large fruits with a good taste. Ripens a few days later than Earliblue.

Note: Leaves are sensitive to strong wind.

'PBBB' (grower selection) (New Zealand)

Bush: This cultivar is probably closely related to Nui. They are hard to discriminate from each other. The plants of PBBB seems to grow more upright and produce more ground shoots than Nui.

Fruit: The berries are in all characteristics equal to Nui.

Note: This cultivar from New Zealand is a grower selection and was not introduced for commercial use. Some plants of this cultivar were legally imported into the Netherlands in 1991. A Dutch grower bought them from the New Zealand grower who selected this cultivar.

'Nelson' (Bluecrop x G-107 (F-72 x Berkeley)) (New Jersey, USA, 1988)

Bush: Open, moderately vigorous plant. Nice shiny leaves. Acceptable production.

Fruit: Large, light blue berries. Fresh berries have good quality. Aftertaste tastes like cherries. Harvest midseason and relatively short. Not suitable for storage.

‘Toro’ (Earliblue x Ivanhoe) (USA, 1987)

Bush: Wide and open bushes. Although bushes are of average size, they yield well.

Fruit: Large berries. Looses firmness rapidly during the harvest. Later pickings gave softer berries. Acceptable shelf life after storage. Midseason harvest.

‘Sierra’ (US 169 (US 79 x US79 (Fla 4B x US-56 (*V. constablaei* x *V. ashei* T-65)) x G-156 (Earliblue x G-77 (Coville x US 11-93))) (USA, 1988)

Bush: Upright, open bushes with strong shoots. Few leaves, especially at the base of the shoots. Poor production.

Fruit: Very firm, average sized berries. Harvest starts a few days after Bluecrop.

‘Chandler’ (No. 139) (Darrow x (Berkeley x 18-9 (GM-37 x CU5))) (USA, 1994)

Bush: Strong, healthy, upright growing plants. Firm shoots which branch profusely. Good production, but a little less than Bluecrop.

Fruit: Very large berries, up to 4 grams each, with a good taste. Harvest starts shortly after Bluecrop.

Note: Chandler was already tested in a previous trial under No.139. At the request of the Dutch blueberry growers, among others, released in 1994. This cultivar is hard to propagate by hardwood cuttings.

‘Bluegold’ (Bluehaven x Me-US5 (Ashworth x Bluecrop)) (USA, 1989)

Bush: Compact, low, bushy plants with horizontal growing branches. Poor production

Fruit: Small, firm berries with a moderate taste. The harvest starts a few days before Coville.

Note: In some years late blooming after the harvest.

‘Caroline Blue’ (Open pollinated seedling of Lateblue) (Australia, 1988)

Bush: Good growing, compact, bushy plants which stay relatively low. Good production.

Fruit: Large berries with a good taste. Relatively late and long harvest.

‘Brigitta Blue’ (Open pollinated seedling of Lateblue) (Australia, 1980)

Bush: Upright bushy plants with good branching. Berries well distributed over the whole plant. Very good production.

Fruit: Average sized berries with a sweet taste. Ripening of the berries equally, therefore a compact harvest. Berreis kept a very good quality after 6-7 weeks storage. Late harvest.

Note: In commercial plantings it has had problems with pollination and fruitsetting.

Production

In the second year the first berries were harvested. The total production of ‘Brigitta Blue’ was the highest followed by ‘Bluecrop’ and ‘Chandler’. ‘Brigitta Blue’ gave each year the highest production, see table 1.

Fruit Weight

In 1999, the first production year, the berries were very large. To give a good impression of the average fruit size, the average fruit weight is taken over the last three years (2000 – 2002), see last column of table 2. ‘Chandler’ had the biggest berries followed by ‘Toro’, ‘Nui’, ‘PBBB’, ‘Sunrise’ and ‘Caroline Blue’. The cultivars ‘Earliblue’, ‘Reka’, ‘Puru’, ‘Coville’ and ‘Elliott’ had berries too small to be recommendable except for ‘Elliott’, which is recommended because it is the latest ripening cultivar.

Firmness of Berries

In 2000 the firmness of the berries was tested twice. Two successive pickings, with one week in between, were tested in a laboratory. Each test was done one day after the harvest. For almost all cultivars the berries were softer by later pickings, except for

‘Sierra’, see table 3.

Storage

In 2000 and 2001 berries of all cultivars were put in storage for 4, 6 and 10 weeks. After storage the berries were judged and sorted into three groups: berries with fruit rot, dried berries and good berries. *Botrytis* was the main cause of fruit rot. Only in 2001 a few berries were affected by *Collectotrichem*.

‘Brigitta Blue’ was by far the best cultivar to store for more than 4 weeks. After 6-7 weeks there were still 88 % of the berries of good quality, see table 4.

CONCLUSIONS

In this trial the bushes of ‘Reka’ were productive and the berries had a good shelf life. ‘Chandler’ (No. 139) was very productive and the average fruit size was very large. ‘Brigitta Blue’ was also very productive and the berries kept very well in storage. This makes these three cultivars (‘Reka’, ‘Chandler’, ‘Brigitta Blue’) recommendable for commercial plantings in the open field. The cultivars ‘Caroline Blue’, ‘Toro’, ‘Sunrise’ and ‘Nelson’ are relatively good cultivars but not much of an improvement on the already-available assortment. Therefore they are less suitable for commercial plantings. Although the fruit quality of ‘Elliott’ is less than other cultivars, it is still recommended because of the very late ripening harvest. Maybe stored berries of ‘Brigitta Blue’ can beat the fresh berries of ‘Elliott’ because of the better fruit quality and shelf life for the fresh market. The other cultivars are not recommended because of poor production (‘Earliblue’, ‘Nui’, ‘PBBB’, ‘Sierra’ and ‘Bluegold’) or small fruit size (‘Coville’) or poor shelf life (‘Puru’, ‘Blueray’).

For advancing the harvest period in a greenhouse or plastic tunnel ‘Nui’ has proven in practice to be a recommendable cultivar. This was not tested in this trial.

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Tables

Table 1. Cumulative production grams per m².

Cultivar	Cumulative production per m ²		
	1999-2000	1999-2001	1999-2002
Earliblue	142	561	1255
Nui	500	1084	2314
Puru	735	1778	3331
Reka	601	1829	3087
Sunrise	743	1915	3334
PBBB	553	1215	2627
Blueray	932	1855	3161
Bluecrop	1445	3112	5486
Nelson	902	1913	3213
Toro	1216	2463	4058
Sierra	911	1794	3624
Coville	1101	1867	3353
Chandler	1563	2768	5060
Bluegold	835	1688	2915
Caroline Blue	1358	2343	4353
Brigitta Blue	2057	3878	7157
Elliott	1380	2262	3613

Table 2. Fruit weight in grams (g) in 1999 – 2002.

Cultivar	Fruit weight (g)				
	1999	2000	2001	2002	Average 2000 – 2002
Earliblue	2,1	1,1	1,3	1,4	1,3
Nui	2,4	1,8	2,1	1,7	1,8
Puru	1,8	1,4	1,6	1,3	1,4
Reka	1,7	1,2	1,6	1,3	1,3
Sunrise	2,0	1,8	1,9	1,8	1,8
PBBB	2,4	1,7	2,1	1,7	1,8
Blueray	1,9	1,5	1,8	1,9	1,7
Bluecrop	2,0	1,5	1,8	1,9	1,7
Nelson	2,1	1,5	1,7	1,8	1,7
Toro	2,1	1,9	2,2	2,1	2,1
Sierra	2,1	1,7	2,0	1,7	1,7
Coville	1,8	1,3	1,7	1,6	1,5
Chandler	2,0	2,4	2,7	2,6	2,6
Bluegold	2,3	1,5	1,8	1,6	1,6
Caroline Blue	1,9	1,6	1,7	1,9	1,8
Brigitta Blue	2,2	1,7	1,8	1,7	1,7
Elliott	1,5	1,3	1,3	1,6	1,4

Table 3. Firmness of berries in 2000 on two successive picking dates.

Cultivar	Firmness (g/mm)	
	07-07-2000	14-07-2000
Earliblue	190	132
Nui	-	145
Puru	182	130
Reka	158	154
Sunrise	-	140
PBBB	199	170
Blueray	166	120
Bluecrop	176	140
Nelson	-	151
Toro	194	135
Sierra	184	183
Coville	-	163
Chandler	-	172
Bluegold	205	146
Caroline Blue	-	178
Brigitta Blue	212	140
Elliott	-	-

Table 4. Fruit Quality after storage of 6-7 weeks and 9-10 weeks.

Cultivar	Harvest date	Percentage of berries (%)					
		After 6-7 weeks storage (24-08-2000)			After 9-10 weeks storage (19-09-2000)		
		Fruit rot	Dried berries	Good berries	Fruit rot	Dried berries	Good berries
Earliblue	6 July	29	15	56	50	39	12
Nui	13 July	9	13	78	18	71	12
Puru	6 July	14	12	72	21	51	29
Reka	6 July	5	9	86	19	30	52
Sunrise	13 July	10	7	82	30	43	27
PBBB	6 July	4	12	83	11	62	27
Blueray	6 July	27	12	61	39	54	7
Bluecrop	6 July	12	18	70	14	45	41
Nelson	13 July	25	69	7	25	75	0
Toro	6 July	9	15	75	19	40	41
Sierra	6 July	13	16	70	21	38	39
Coville	13 July	28	7	66	68	22	10
Chandler	13 July	27	5	70	51	10	39
Bluegold	6 July	16	24	60	23	66	11
Caroline Blue	13 July	20	1	79	34	14	50
Brigitta Blue	6 July	7	4	88	11	22	66
Elliott	17 August	-	-	-	9	55	37