

Harvesting Sea Buckthorn by Cutting Method in Finland

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EuroWorkS-OnAir-1, 25th of May 2021

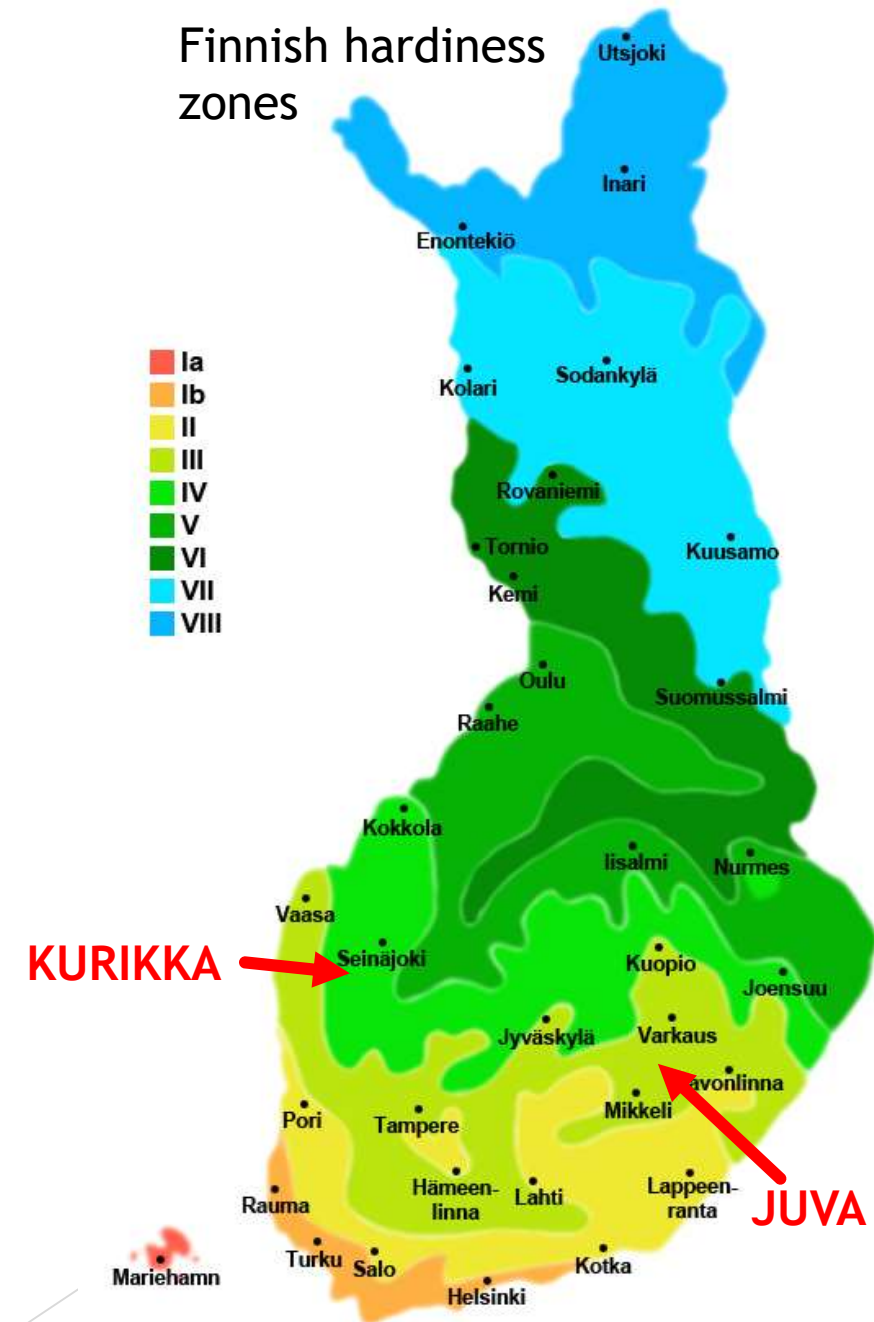
Do the plants stand harvesting by cutting in Finnish climate?

Is harvesting by cutting profitable?

-> we need yield information

Two testing areas in different hardiness zones

- ▶ Two locations (Juva and Kurikka), three cultivars ('Terhi', 'Tytti' and 'Irja')
- ▶ Two cutting methods (Total cut and vertical split)
- ▶ Each cultivar had eight test plants
- ▶ Plants were planted 2011-2012, harvesting started 2015 -> some of the bushes have been cut four times this far, but most of them less than that
- ▶ Moderate fertilizing, drip irrigation on 2019->
- ▶ Berries, leaves and branches of each bush were weighed and their share calculated



Cutting methods

► Total cut

- All the branches of the upper part of the bush are cut down from the height of 50-80 cm.
- This was done every other year to some of the bushes and every third year to the others to find out if two resting years are needed instead of one.
- Branches growing below cutting line were saved.

► Vertical split

- The bush is divided vertically into half and the first harvesting year only the other part is cut down.
- The other part is harvested next year.
- The bush is having rest during the third year



Terhi nro 1 in front
(year 2020):

Total cut every other
year

Height before cutting
160 cm

3458 g berries,
1006 g leaves,
1145 g branches



Terhi nro 1 in front
(year 2020):

Total cut every other
year

3458 g berries,
1006 g leaves,
1145 g branches

Cutting height 70 cm

Yields of 'Terhi' in Juva were highest

'Terhi' berries in Juva					Total cut		Vertical split	
Year	M1	M2	M3	M4	M5	M6	M7	M8
2015	2326	3296	2082	1338	1431	0	0	0
2016	1237	2278	2934	0	0	2195	5354	6051
2017	0	0	0	4228	3610	0	0	0
2018	5842	7679	7300	0	0	0	0	0
2019	0	0	0	3754	2053	3287	4183	6214
2020	3458	2854	5307	0	0	0	0	0
Average in harvest year	3216	4027	4406	3107	2365	2741	4769	6133
Average over time	2144	2685	2937	1553	1182	914	1590	2044

- Yields are grams per bush.
- Harvesting time was always around middle of September.
- Vertical split changes easily into total cut.

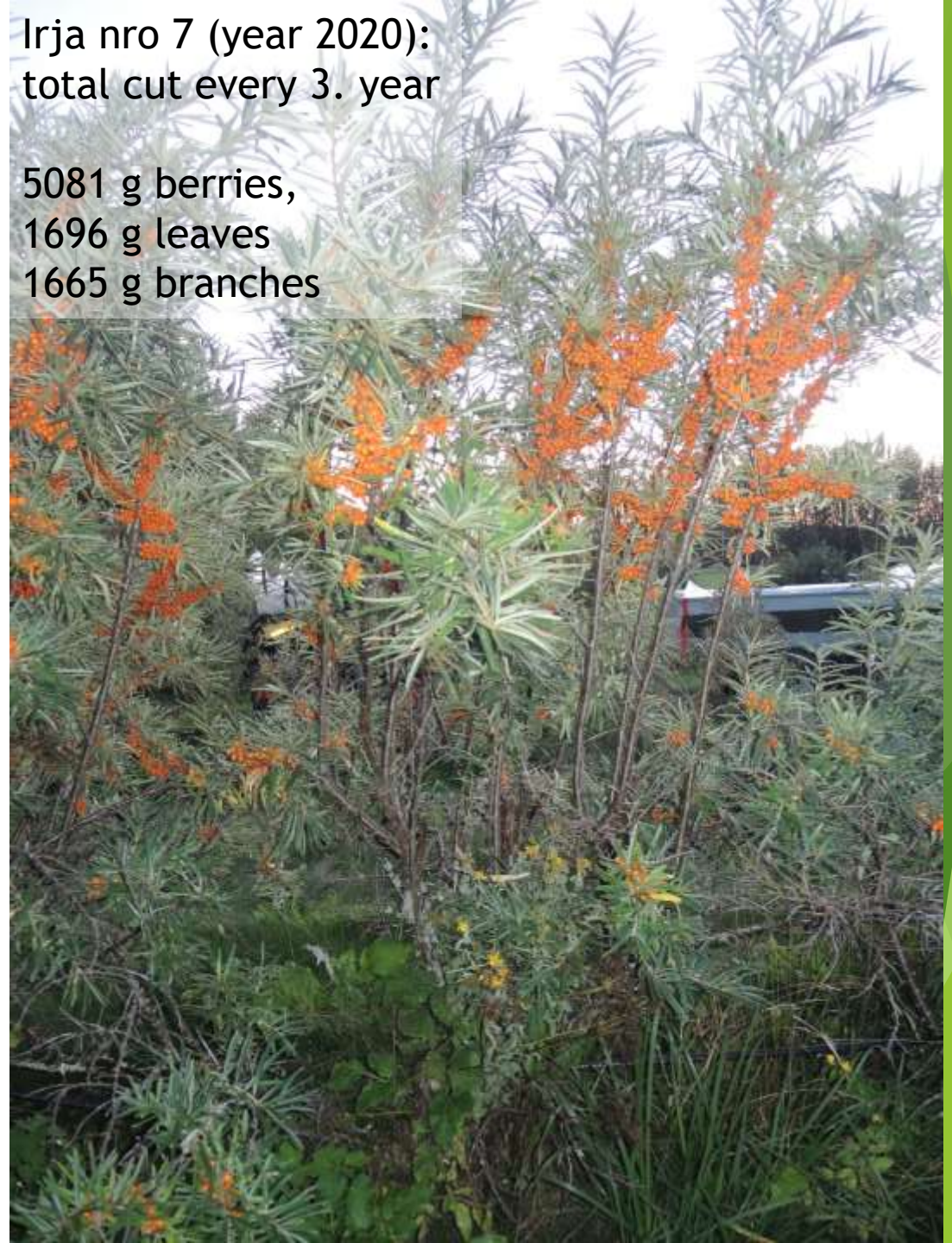
Irja nro 6 (year 2020):
total cut every 3. year

5622 g berries,
2174 g leaves
2030 g branches



Irja nro 7 (year 2020):
total cut every 3. year

5081 g berries,
1696 g leaves
1665 g branches



Irja nro 1 (year 2020):
Vertical split

2948 g berries,
2008 g leaves
1949 g branches



"Irja" is very productive

"Irja" berries in Juva					Total cut	Vertical split		
Year	M1	M2	M3	M4	M5	M6	M7	M8
2015	2533	1742	2241	2110	0	0	0	0
2016	2286	697	0	1932	3719	0	0	3958
2017	1538	1066	2749	0	0	3122	3233	0
2018	0	0	0	4061	0	0	0	0
2019	3301	2602	1284	2285	4404	0	0	4919
2020	2948	0	0	0	0	5622	5081	0
Average in harvest year	2592	1527	2091	2597	4062	4372	4157	4439
Average over time	2101	1018	1046	1731	1354	1457	1386	1480

- ▶ In the table are yields of eight bushes separately, in grams.
- ▶ Harvesting time was every year in the first half of September.
- ▶ Yield changes from year to another in vertical split.

The best average yield per bush this far is about 1500 g

	Juva			Kurikka		
	Terhi	Tytti	Irja	Terhi	Tytti	Irja
Total cut every second year	1368	1320	1046	799	857	Variable
Total cut every third year	1516	920	1419	405	462	yields,
Vertical split	1573	1327	1342	960	952	no valid data
AVERAGE	1486	1189	1269	721	757	

Yields in Kurikka location have been much less -> climate is not so favourable there compared to Juva (clayish soil, lower mean temperature, less snow in winter).

- ▶ These figures tell how much you get crop every year after harvesting has started, even if the bush has a year of resting.
- ▶ With 1500 g/bush and 1800 female plants/ha -> 2 700 kg/ha divided to every year, and in a year of harvest: in vertical split 4050 kg/ha, in total cut every third year 8100 kg/ha and in total cut every second year 5400 kg/ha
- ▶ According to profitability calculations average yield should be around 2000 g/bush in order to get production profitable.

Share of the berries, leaves and branches

▶ 'Terhi' and 'Tytti':

- ▶ **Berries 65%, leaves 16%, branches 20%**
- ▶ Cultivars grow moderately but are regenerating very well without dying back
- ▶ Can be cut down into very low stem

▶ "Irja":

- ▶ **Berries 52%, leaves 27%, branches 21%**
- ▶ Strongly growing cultivar with big leaves
- ▶ Very good to regenerate, no dying back

Summa summarum

- ▶ Harvesting by both cutting methods is possible in Finland: plants survive and regenerate (if the cultivar is winterhardy in the area)
 - ▶ Harvesting in September means that bushes are already prepared to winter and don't lose so much energy in cutting
- ▶ Profitable production depends of course on many factors, but in calculations according to Anu Koivisto (EuroWorkS2014 publication) average yield should be around 2-2,5 kg/bush in order to have profitability ratio over 1. -> with better irrigation it could come closer, what else?
- ▶ To get more confirmed results, and to know what happens when bushes get older, Sanna is going to continue harvesting of the test field at least five more years.
- ▶ Thank you for your attention!