

Evaluation of 14 sour cherry cultivars

Vurdering af dyrkningsværdi for 14 sorter af surkirsebær

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Summary

The evaluation was based upon tree health, the yield over an eight year period in the orchard and upon juice characteristics.

It is concluded that besides the reference cultivar 'Stevnsbær', which is the most grown cultivar in Denmark, only 'Mocanesti 16/4' is of further commercial interest.

Key words: Sour cherry, cultivars, flowering, yield, fruit quality.

Resumé

Vurdering af dyrkningsværdien er baseret på træernes sundhed, udbytte de første otte år i plantagen og på kvaliteten af saften.

Der konkluderes, at foruden målesorten 'Stevnsbær' er kun 'Mocanesti 16/4' af fortsat interesse.

Nøgleord: Surkirsebær, sorter, blomstring, udbytte, frugtkvalitet.

Introduction

Cultivars of sour cherry are continuously collected for an evaluation of their commercial value under Danish conditions. The yield and the resistance to *Pseudomonas* and other diseases are considered to be the most important criteria. However, the quality of the fruit, expressed as intensity of colour, and content of sugars and acids is also regarded as a very important criteria.

Cherries with coloured juice (morellos) are of major interest in Denmark. Therefore, different clones of 'Stevnsbær' were used as reference cultivars.

Material and methods

Maiden trees were planted during spring 1980 in a randomized 8-block, single tree experiment. The trees were grafted on *Prunus avium* 'F12/1' and planted at a distance of 5.5 × 3.5 m. As the optimum ripening date is difficult or impossible to assess visually, the quality of the fruit was determined from samples of 100 fruits picked 2–3 times with intervals of 3–4 days during the ripening season.

The trees were harvested mechanically with a Schaumann shaker. The yield records include shaken fruit only.

Results

Tree growth

The size of the trees was determined after five years in the orchard. At that age some of the cultivars had reached the maximal tree width equal to the planting distance of 3.5 m (Table 1).

The 'Stevnsbär' clones gave the most vigorous trees. The shape of the trees varied only little among the varieties, except 'Mailot' and 'Elmer', which had flat roundish crowns.

Tree health

After eight years in the orchard most of the trees were in good health. An exception was the trees of 'Fanal', half of the trees were dead or in very poor health. Of other varieties only single trees were lost, probably due to trunk damage from tree shaking at harvest, but in no case in a proportion to indicate any significant difference among the varieties.

Season of flowering

The flowering period varied only eight days between years. The variation between most of the cultivars was on average only two-three days. However, the difference between the earliest and the latest flowering period was as much as seven

days, which may be too great for a satisfactory cross pollination (Table 1).

Season of harvest

The fruit was harvested mechanically, when it visually were judged to have reached maximum juice colour. All fruit from each cultivar was harvested the same day. The cultivars covered a harvest period from 1 to 20 August, with 'Zukovskaja' as the earliest (Table 1).

Fruit yield

Table 2 shows the annual and total yield from 1982-1987, i.e. from 3rd to 8th year in the orchard. Gradually as the cultivars were found to be unimportant for commercial production, they were discarded from further yield records.

In this trial 'Stevnsbär' was the most productive cultivar, and no clone gave higher yield than another.

Fruit quality

The quality of the fruit and the juice was determined over three years as intensity of juice colour, acidity, soluble solids, per cent stone in relation to weight of the fruit and fresh fruit weight. The results are shown in Table 3.

Table 1. Tree characteristics: tree size after 5 years in orchard, date of flowering (average 6 years), date of harvest (average 4 years).

Træ-karakteristik: træ-størrelse efter 5 år i plantage, blomstringsdato (gns. af 6 år), høstdato (gns. af 4 år).

Variety <i>Sort</i>	Tree size, cm <i>Træ-størrelse, cm</i>		Date of flowering <i>Blomstringsdato</i> 100 p.c. open <i>100 pct. åbne</i>	Date of harvest <i>Høstdato</i>
	height <i>højde</i>	width <i>bredde</i>		
'Stevnsbär', cl Viki	380	327	15 May	19 Aug.
'Stevnsbär', cl 24	397	323	14 -	20 -
'Stevnsbär', cl 34	385	342	16 -	18 -
'Stevnsbär', cl F.R.	388	312	15 -	20 -
'Leitzkauer'	360	305	15 -	20 -
'Mocanesti 16/4'	365	327	11 -	13 -
'Fanal'	322	262	15 -	12 -
'Suda'	308	270	16 -	15 -
'Mari Timpurii'	313	288	18 -	11 -
'Mailot'	280	298	15 -	2 -
'Zukovskaja'	360	347	15 -	1 -
'Elmer'	257	272	17 -	8 -
'Marasca Bijela Polozita'	393	328	15 -	15 -
'Vitova'	227	200	15 -	
LSD 95	31	27	0.9	

Table 2. Fruit yield 1982–87, kg per tree.
Frugtudbytte 1982–87, kg pr. træ.

Variety <i>Sort</i>	1982	1983	1984	1985	1986	1987	1982–87
'Stevnsbär', cl Viki	1.2	12.7	23	32	29	30	128
'Stevnsbär', cl 24	0.9	13.2	25	33	27	29	128
'Stevnsbär', cl 34	0.5	11.7	28	28	31	28	127
'Stevnsbär', cl F.R.	0.4	8.3	26	29	28	30	122
'Leitzkauer'	0.3	6.4	25	29	23	31	115
'Mocanesti 16/4'	0	4.7	32	28	25	19	109
'Fanal'	3.7	7.4	20	21	24	25	101
'Suda'	4.8	5.2	17	22	21	15	70
'Mari Timpurii'	0.4	1.8	18	8	21		
'Mailot'	0	0.2	19	4	9		
'Zukovskaja'	0	0.5	12	5	8		
'Elmer'	0	0.6	16	6			
'Marasca Bijela Polozita'	0	0.3	10	4			
'Vitova'	0.1	0.1					

Colour of the fruit juice. In accordance with earlier results the juice of 'Stevnsbär' was very dark. 'Mocanesti' and 'Zukovskaja' were almost colourless and should be regarded as amarelles.

Acidity. It is remarkable that an amarelle as 'Mocanesti 16/4' had a content of acids as high as the dark coloured cultivars. No cultivars contained more acid than 'Stevnsbär'.

Soluble solids. 'Mailot' was outstanding for high content of soluble solids, whereas it was extremely low in 'Vitova'.

Stone per cent. There was a rather close negative relationship between fruit size and stone percentage. Therefore, the small-fruited 'Stevnsbär' clones had a high stone per cent and 'Elmer' a very low.

Table 3. Fruit quality, average 3 years.
Frugtkvalitet, gns. af 3 år.

Variety <i>Sort</i>	Colour ¹⁾ <i>Farve</i>	Acidity ²⁾ <i>Syre</i>	Solids ³⁾ <i>Tørstof</i>	Stone p.c. ⁴⁾ <i>Sten pct.</i>	g/fruit <i>g/frugt</i>
'Stevnsbär', cl Viki	212	2.24	17.0	7.5	2.9
'Stevnsbär', cl 24	222	2.23	16.8	7.4	3.0
'Stevnsbär', cl 34	212	2.16	16.8	7.5	2.8
'Stevnsbär', cl F.R.	209	2.20	16.1	7.5	3.0
'Leitzkauer'	211	2.11	16.9	6.8	3.7
'Mocanesti 16/4'	41	1.99	15.3	6.4	3.8
'Fanal'	193	1.91	14.9	6.4	5.2
'Suda'	82	1.64	13.1	6.0	5.0
'Mari Timpurii'	98	1.89	14.2	5.8	4.9
'Mailot'	120	1.82	18.0	6.8	5.0
'Zukovskaja'	14	1.46	15.3	5.3	3.5
'Elmer'	76	2.00	14.3	5.2	6.4
'Marasca Bijela Polozita'	214	2.21	18.4	7.7	3.5
'Vitova'	82	1.52	11.0	6.2	4.9
LSD 95	46	0.22	0.7	0.6	0.4

1) mg malvidinchloride per 100 g

mg malvidinchlorid pr. 100 g

2) per cent titrable citric acid

procent titrerbar syre

3) refractometer reading

refraktometer aflæsning

4) stone weight in per cent of fruit weight

stenvægt i procent af frugtvægt

Fruit size. The most pronounced difference in fruit size was found between the small-fruited 'Stevnsbär' clones on one side and most other cultivars on the other side. 'Elmer' was outstanding in having very big fruits.

Description of the cultivars

'*Elmer*'. Origin: Holland 1972. Schattenmorelle × Mayduke. The cultivar was productive in Dutch trials. However, in this trial the yield was so low that already on an early stage it was regarded as being without any interest for Denmark.

References: 18, 26.

'*Fanal*' was tested earlier and described by the author recently (25). In this trial the trees were very unhealthy as also experienced in Danish commercial orchards. The trees are very susceptible to bacterial cancer and half of the trees died during the first eight years in the orchard. Healthy trees gave a good crop of high quality fruit. It is not recommended for planting.

Reference: 25.

'*Leitzkauer Pressauerkirsche*'. Origin: Germany. It was grown in the southern part of Germany. The tree and fruit characteristics, including yield and ripening season, are much like 'Stevnsbär'. The only difference seems to be its bigger fruits. It is not considered as an improvement on 'Stevnsbär'.

References: 4, 9, 11, 13, 14, 15.

'*Mailor*'. Origin: Germany 1964. 'Schattenmorelle' × 'Rote Mai'. Its most important merit is a very early ripening, 2–3 weeks earlier than 'Stevnsbär', and a very high content of soluble solids. However, in accordance with German trials the yield has been too low to have any commercial value.

References: 26, 27.

'*Marasca Bijela Polozita*'. Received from Yugoslavia. The tree and fruit characteristics are very much like 'Stevnsbär', except a higher content of soluble solids. However, under our conditions the yield was so low that the variety was discarded early.

'*Mari Timpurii*'. Origin: Romania. Supposed to be a cross between *Prunus avium* and *P. cerasus*. It is described as a very valuable cultivar in Romania. The fruit is much like 'Schattenmorelle' in size and quality. Under our conditions the yield was too low for a cultivar without any special merit.

References: 3, 5, 6, 12.

'*Mocanesti 16/4*'. Origin: Romania, clone of 'Mocanesti'. It was selected for early bearing, high yield and good quality. In this trial as well as in trials in other countries the trees were healthy and very productive. The fruit is of medium size, has an almost colourless juice with high content of acids. The cultivar is recommended for trial planting and further observation.

References: 2, 3, 6, 7, 12, 16.

'*Stevnsbär*'. Origin: Denmark. Selection from wild *Prunus cerasus*. The tree is vigorous, healthy and the most productive cultivar in this trial. The fruit is small, the juice very dark red with a high content of soluble solids and acids. It is considered as the most valuable cultivar under Danish conditions.

In this trial four clones were tested, however, none of them differed significantly from one another. The clone 'Viki' may still be recommended.

References: 1, 10, 20, 21, 22, 23, 24, 25.

'*Suda*'. Synonym: 'Suda Hardy'. Probably a seedling of 'Schattenmorelle'. Origin: Missouri, USA, about 1880. In accordance with results elsewhere, it does not seem to be an improvement of its parent cultivar. The tree was of medium size, the fruits content of sugars and acids was low.

References: 8, 26.

'*Vitova*'. Origin: Czechoslovakia, where it has been recommended for planting. In this trial, the yield was so low that it was discarded from the trial at a very early stage. The quality was also very poor.

References: 17, 18, 26.

'*Zukovskaja*'. Origin: Russia, about 1932. It was selected for high yield and early ripening. In this trial it was the earliest of all cultivars. The yield, however, was very low, and in accordance with other results the content of acids was very low. The juice is colourless.

References: 4, 19.

Conclusion

The main object of this work was to evaluate sour cherry cultivars for their productivity and quality.

Besides the reference cultivar 'Stevnsbär' only 'Mocanesti 16/4' seems to be of further interest for Danish conditions. It has colourless juice (amarelle), is very productive and has a very high content of acids.

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