Evaluation and numerical studies of qualitative and morphological characteristics of 49 sweet cherry cultivars. III

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Summary
The following characteristics were studied: season of flowering and ripening, fruit colour, size, firmness and cracking susceptibility. In addition a numerical description of the most important morphological characteristics is given.

It is concluded that the majority of cultivars are without merit or superfluous for Denmark. However, 3 white and 7 red cultivars had qualities, which merited further commercial testing.

Key words: *Sweet cherry, cultivars, fruit size, firmness, cracking, morphological characteristics.*

Introduction

Cultivars of sweet cherries are continuously collected for an evaluation of their commercial usefulness under Danish conditions. The cracking susceptibility, the size and the firmness of the fruits together with their ripening season and fruit colour are considered to be the decisive characteristics in an evaluation of their economic quality.

For the description of the cultivars, numerical records of the most important morphological characteristics of the fruit, the stone and the leaf are carried out.

Earlier reports (*Christensen* 1970 and 1974) described 75 cultivars and the value of those characteristics were reported.

Material

Most of the tested cultivars originate from Germany or North America. Propagation material was received from following persons or institutes:

Bulgaria: 1) Institut po Ovostarstvo, Plovdiv. *Canada:* 2) Horticultural Exp. St., Vineland, Ontario. *Denmark:* 3) M. Voight Petersen, Oure. 4) Royal University of Agriculture, Copenhagen. *Germany:* 5) Institut für Obstbau, Hohenheim. 6) Dr. D. Dähne, Koblenz. 7) Obstbauversuchsanstalt Jork. *Poland:* 8) Instytut Sadownictwa, Skiernisvicach. *Sweden:* 9) Balsgård Fruit Breeding Institute. 9) Rånna Experimental Garden, Skövde. 10) G. Almer, Nordanvik, Näsum. *Switzerland:* 11) Forschungsanstalt für Obstbau, Wädenswill. *USA:* 12) New York State Agr. Exp. St., Geneva. 13) Oregon State University, Corvallis. 14) University of Idaho, Moscow. *England:* 15) East Malling Research Station.

The list of cultivars and their place of origin, using the above numerical system, are shown in Table 1 (first two colums).

Method

Records were made for at least 3 years. Fruit weight, cracking tendency, and firmness were determined three times during the ripening season each year. For each of these determination samples of 50 fruits were used. Firmness was assessed subjectively on a scale from 1 to 10. Tendency of cracking was determined according to a modification of the Verner-method (*Christensen* 1972) over a 6 hour period. Date of bloom

Table 1. *Fruit characteristics and fertility of trees*)*

	Origin	Season	Colour	Fruit size	Fruit shape	Fruit stalk	Firmness	Cracking	Fertility
Annabella	7	5	5	7	4	9	5	5	7
Altenburger Melonenkirsche	9	7	3	5	3	5	7	5	7
Barbara	9	5	5	5	4	7	5	7	5
Badacsoner	1	7	5	9	5	7	7	7	5
Balsgård 20406	9	5	5	5	5	5	7	3	5
Belvitsa	1	3	5	3	3	5	5	5	5
Beta	11	5	5	3	4	7	7	3	5
Bianca	7	7	5	5	5	7	7	3	5
Black Giant	12	7	5	5	2	3	7	9	5
Bleyhls Braune	5	3	5	3	3	5	7	7	5
Boitzeburger	9	3	5	5	5	5	5	7	5
Burbank	12	3	5	5	5	3	5	7	7
Chinook	12	5	5	9	2	5	7	9	5
Clark September	4	7	5	1	5	5	5	3	5
Coes Transparante	9	3	3	3	1	3	5	1	5
Drögsperyds Medeltidiga	10	5	5	3	5	5	5	5	5
Drögsperyds Tidiga	10	3	5	3	4	5	5	7	7
Esperen	4	5	3	7	4	5	7	7	3
Flamentiner (A)	9	5	3	3	3	7	5	5	5
Flamentiner (B)	4	5	3	5	3	5	5	3	7
Fromms Schwarze Herz	9	5	5	5	5	5	5	7	3
Frühe Meckenheimer	6	3	5	5	5	9	5	5	7
Frühe von Dobitschen	9	3	5	5	3	5	5	5	5
Greening	12	7	5	5	2	3	7	5	3
Grosse Schwarze Herz	4	5	5	7	2	5	7	5	3
Hauschilds Frühe Schwarze	4	5	5	3	2	3	5	7	5
Hoskins	13	7	5	7	3	5	7	3	3
Hudson	12	9	5	7	2	5	7	3	5
Lamida	14	7	5	7	4	5	7	9	5
Lucien	4	5	3	3	5	5	5	3	5
Mahognibär	10	7	5	3	5	3	7	3	7
Merton Late	15	9	3	3	4	5	7	1	7
Moreau	8	3	5	7	3	3	7	9	5
Poznanska	1	7	3	5	2	5	7	5	5
Ranna Ljaskovska	1	1	5	3	5	5	5	3	5
Rebekka	7	5	5	5	3	7	5	5	5
Schauenburger	3	9	5	5	5	7	5	3	3
Schneiders Späte Knorpel	11	7	5	9	5	7	7	7	7
Schrecken	15	5	5	5	5	5	7	7	
Souvenir des Charmes	5	3	5	7	2	3	7	9	3
Spitze Braune	5	3	5	5	5	3	5	5	5
Sue	9	5	3	5	5	5	7	1	7
Teichners Schwarze Herzkirsche	5	3	5	5	2	3	5	5	7
Valera	2	5	5	5	4	5	5	9	5
Valeska	7	5	5	5	5	5	5	5	7
Vega	2	5	3	7	1	3	7	5	7
Velvet	2	7	5	5	4	5	7	7	7
Wolska Wczesna	8	3	5	5	2	5	7	5	5
Östads Röda	10	9	5	5	5	5	7	3	5

*) See text (page 150–151) for interpretation of numerical data.

was recorded as the day when 90% of the flowers were open.

The dimensions of the fruit, stone and leaf were assessed on samples of 15 fruits each year. As in an earlier study (*Christensen* 1970) leaf measurements were made on the fifth leaf from the base of the summer shoot, on samples being taken in August.

All actual data are changed into notes according to »Guidelines for the conduct of tests for distinctness, homogeneity and stability« prepared by the »International Union for the Protection of new Varieties« (UPOV). Those characteristics which are not included in these guidelines are noted according to the same principles, i.e. the numbering of groups depends upon the stability of the characteristics.

The notation of the cultivars is based on data from about 130 cultivars, thus values deviating less than at the 95% level (LSD_{95}) from the average are noted as 5.

Results

The fruit

Season of maturity

The sesaon of maturity was judged visually from skin volour. The data in Table 1 refer to following grouping, (actual mean dates of harvest in brackets):

1 = very early (earlier than 29th June)
3 = early (29th June – 8th July)
5 = medium (9th July – 20th July)
7 = late (21st July – 31st July)
9 = very late (later than 31st July)

Colour of skin

The cultivars were divided into three major colour groups:

1 = yellow (uncoloured juice)
3 = vermillion on a pale yellow ground volour (uncoloured juice)
5 = mahogany or black (coloured juice)

Fruit size

The data for fruit size in *Table 1* are based on fruit weight according to the following size grouping (actual size in brackets):

1 = very small (< 3,6 g)
3 = small (3,6 – 5,0 g)
5 = medium (5,1 – 6,5 g)
7 = large (6,6 – 8,0 g)
9 = very large (> 8,0 g)

Fruit shape

A non-numerical characteristic proposed in the UPOV guidelines has been used to describe fruit shape. The notes refer to shapes shown in *Figure 1*.

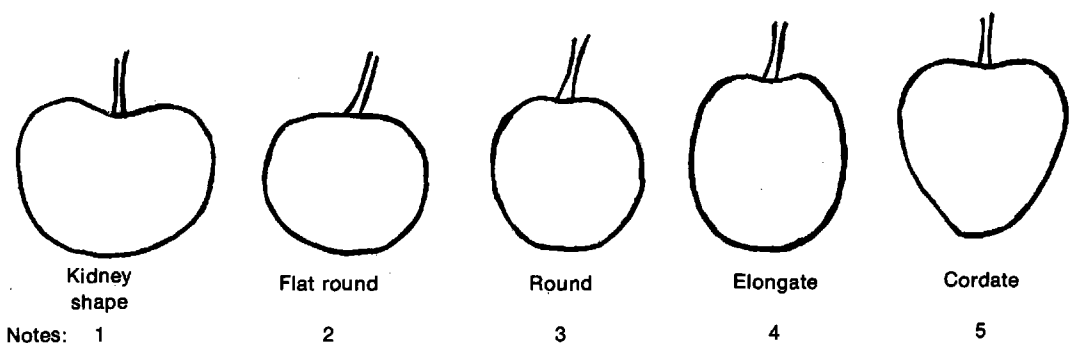

Fig. 1. *Fruit shape and notes according to guidelines prepared by »International Union for the Protection of new Varieties« (UPOV).*

Length of fruit stalk

The data refer to the following grouping (actual size in brackets).

1 = very short (< 29 mm)
3 = short (29 – 38 mm)
5 = medium (39 – 48 mm)
7 = long (49 – 58 mm)
9 = very long (> 58 mm)

Firmness of fruit

The data in *Table 1* refer to

3 = soft
5 = medium
7 = firm

Tendency to fruit cracking

The data in *Table 1* are based on cracking indexes and refer to the following grouping (actual range of cracking indexes in brackets).

1 = very low (< 24)
3 = low (24 – 46)
5 = medium (47 – 67)
7 = high (68 – 82)
9 = very high (> 82)

Tree fertility

Fruit set was assessed visually over at least four cropping years. The notes in *Table 1* refer to following categories:

3 = low yield
5 = medium yield
7 = high yield

The stone

Stone size

The size of the stone has earlier been assessed by its weight (*Christensen* 1974). However, stone weight was shown to have a considerable annual variation, and it is now recognized that weight is not correlated with volume. Therefore, stone volume is probably of greater value as a varietal distinction mark than is stone weight.

In absence of exact volumetric data the volume was calculated from the dimensions of the stone. The data in *Table 2* refer to the following size grouping:

3 small (< 300 mm^3)
5 = medium (300–420 mm^3)
7 = large (> 420 mm^3)

Stone. Relative size in comparison with fruit

The determination of this characteristic is based on the volume of the two characteristics. The notes in *Table 2* refer to:

3 = small (<6.0 per cent of fruit size)
5 = medium (6.0–8.5 per cent of fruit size)
7 = large (>8.5 per cent of fruit size)

Stone shape

The shape of the stone was assessed by means of the ratio of length/breadth. The data in *Table 2* refer to:

3 = spherical (ratio length/breadth < 1.12)
5 = intermediate (ratio length/breadth 1.12 – 1.30)
7 = elongate (ratio length/breadth > 1.30)

The leaf

Lamina length

The data in *Table 2* on leaf size are based on measurements of leaf length and refer to following grouping:

3 = small (< 134 mm)
5 = medium (134 – 168 mm)
7 = large (> 168 mm)

Lamina: length/breadth ratio

The data in *Table 2* refer to:

3 = low ratio (< 1.94)
5 = medium ratio (1.94 – 2.00)
7 = high ratio (> 2.50)

Petiole length

The data in *Table 2* refer to:

3 = short (< 39 mm)
5 = medium (39 mm – 48 mm)
7 = long (> 48 mm)

Petiole, relative length in comparison with lamina lenght

The data in *Table 2* refer to:

Table 2. *Characteristics of stone, leaf and season of flowering*)*

	Stone			Leaf			Petiole	
	Size	Rel. Size	stone shape	blade size	Leaf shape	Petiole lenght	rel. lenght	Flowe-ring
Annabella	5	5	5	5	5	7	7	5
Altenburger Melonenkirsche	5	5	5	5	5	3	5	5
Barbara	7	7	5	5	5	7	7	5
Badacsoner	5	3	5	5	5	5	5	7
Balsgård 20406	5	5	5	5	5	5	5	5
Belvitsa	3	5	7	5	7	3	3	1
Beta	3	5	7	5	5	7	7	5
Bianca	5	5	7	3	5	7	7	7
Black Giant	5	5	3	5	5	5	5	5
Bleyhls Braune	3	5	5	3	5	3	5	5
Boitzeburger	5	5	5	5	5	5	5	5
Burbank	7	7	5	5	5	5	5	3
Chinook	7	5	3	5	7	5	3	3
Clark September	3	7	7	3	3	5	7	5
Coes Transparente	5	7	3	5	5	5	5	5
Drögsperyds Medeltidiga	5	5	5	5	3	5	5	7
Drögsperyds Tidiga	3	5	5	5	5	5	5	5
Esperen	5	5	5	5	5	5	5	5
Flamentiner (A)	5	7	5	5	5	5	5	3
Flamentiner (B)	3	5	5	3	5	5	5	7
Fromms Schwarze Herz	5	5	5	3	5	5	5	7
Frühe Meckenheimer	5	5	5	7	5	7	5	5
Frühe von Dobitschen	5	5	3	5	5	5	5	5
Greening	5	5	3	5	3	3	5	5
Grosse Schwarze Herzk.	5	3	3	5	5	5	5	5
Hauschilds Frühe	5	7	5	5	5	5	5	5
Hoskins	5	7	5	3	5	3	5	7
Hudson	7	5	5	5	5	5	5	7
Lamida	7	5	5	5	7	7	7	5
Lucien	5	7	5	5	5	3	3	7
Mahognibär	5	7	7	3	5	3	5	5
Merton Late	3	5	5	3	5	3	5	5
Moreau	7	5	5	5	5	7	5	5
Posnanska	5	5	5	5	5	5	5	5
Ranna Ljaskovska	3	5	5	5	5	5	5	5
Rebekka	7	7	5	5	3	7	7	7
Schauenburger	5	5	5	5	5	5	5	7
Schneiders Späte	7	3	5	5	5	7	7	7
Schrecken	7	7	5	5	5	7	5	
Souvenir des Charmes	7	5	5	5	5	7	5	5
Spitze Braune	5	5	7	5	5	5	5	5
Sue	5	5	5	5	5	3	5	5
Teichners Schwarze	5	5	5	5	7	5	5	5
Valera	5	5	5	5	5	5	5	3
Valeska	7	7	7	5	5	7	7	3
Vega	5	3	5	7	5	7	7	5
Velvet	5	5	5	5	5	3	5	5
Wolska Wczesna	7	7	5	5	7	5	5	5
Östads Röda	5	5	5	3	5	5	5	5

*) See text (page 151–153) for interpretation of numerical data.

3 = low (ratio blade/petiole > 5.00)
5 = medium (ratio blade/petiole 4.00 – 5.00)
7 = high (ratio blade/petiole < 4.00)

Season of flowering

The data in *Table 2* refer to:
1 = very early
3 = early
5 = medium
7 = late
9 = very late

Evaluating of varieties

The commercial value of the cultivars is briefly discussed. This judgement is mainly based upon resistance to cracking and fruit size, but firmness and fertility of the trees are also taken into consideration. The origin and the parentage is given as far as it is known. Other references used in identification of the cultivars are affixed by numbers, which refer to the list of references (page 156).

'Annabella'. Origin: Jork, Germany, 1970. 'Rube' x 'Allers Späte' (48). Most qualitative characteristics are about medium. Further experience is desired to establish its commercial value. Reference: 86.

'Alternburger Melonenkirsche'. Origin: Germany. Synonyms: 'Gewöhnliche Melonenkirsche', 'Aufrechte Königkirsche'. Very much alike 'Büttners Späte Knorpel' (80), but is supposed to be an independent cultivar (20) (42). It has not shown any merits better than 'Büttners'. References: 16, 39.

'Barbara'. Origin: Jork, Germany. 'Schubach's' x 'Rube' (49). It ripens in the same season as another Jork-introduction 'Valeska', but has not such good qualities. The tendency to cracking is much higher. References: 16, 61, 86, 40.

'Badacsoner'. Origin: Hungary, before 1869 (20). The data in this trial confirm earlier observations (29) that it is little different from 'Schneiders Späte'. The cultivar was received from Bulgaria and is most likely a synonym to 'Schneiders'. References: 4, 16, 30, 31.

'Balsgård 20406'. Origin: Balsgård, Sweden. 1971. 'Erianne' x 'Allmän Gulröd' (58). The cultivar is fertile and the fruits have a low tendency to cracking. It ripens with other good cultivars of similar season, but it deserves a further trial.

'Belvitsa'. Origin: Bulgaria. Synonym: »Rajdavitska Belvitsa' (75). It ripens at the same time as 'Ohio Beauty', and has not shown any major improvement over the latter cultivar.

'Beta'. Origin: Wädenswill, Schwitzerland. 1968. 'Zweitfrühe' x 'Basler Adler' (66). Although the fruits are small further work would be worthwhile because of its low tendency towards cracking and good fertility of the trees. References: 16, 41.

'Bianca'. Origin: Jork, Germany. 1966. 'Rube' x 'Allers Späte' (49). The very firm fruits have a low tendency to cracking and the trees are fertile. However, its smaller fruits than most cultivars of similar season make its commercial value doubtful. References: 16, 40, 61.

'Black Giant'. Origin: Burbank, California. 1914. (45). The fruits have a very high tendency to cracking and the cultivar does not seem to be of as high commercial value as several others. References: 8, 68, 69, 70.

'Bleyhls Braune'. Origin: Germany. Synonym: Bleyhls Nr. 2. (20). Has not shown any better characteristics than many other cultivars in its season. References: 21, 30, 62, 67.

'Boitzeburger'. Origin: Germany. Synonym: 'Frühe Boitzeburger'. Ripens in a season with several cultivars of higher qualitative characteristics. References: 16, 33, 51, 57.

'Burbank'. Origin: USA ca. 1911. Synonym: 'Burbank Early' (31). Has been confused with 'Black Giant'. It has not shown any special characteristics which justify distribution. Referencers: 16, 27, 28, 31, 42, 69, 70, 71, 73.

'Chinook'. Origin: Washington, USA. 1960. 'Bing' x 'Gil Peck' (82). In spite of good quality this cultivar may not have any commercial value, owing to an extremely high tendency towards fruit cracking. References: 11, 13, 16, 39, 25, 39, 53.

'Clark September'. Origin: Nova Scotia, before 1890 (31). It is uncertain if this cultivar is true to name. In any case, it does not have any commercial value owing to the extremely small fruits.

'Coes Transparente'. Origin: Connecticut, USA, ca. 1800. Synonym: 'Coe', Coe's Bunte Transparente' (31). The outstanding cracking resistance makes this cultivar of great interest for breeding. The fruits resembles 'Ohio Beauty' and are of too poor quality for dessert purpose. References: 16, 34, 39, 45, 56.

'Drögsperyds Medeltidiga'. Origin: Sweden ca. 1900 (1). All qualitative characteristics are intermediate and its commercial value is doubtful.

'Drögsperyds Tidiga'. Origin: Sweden about 1900 (1). The trees are very fertile, but the fruits are small and have a high tendency towards cracking.

'Esperen'. Origin: Belgium, ca. 1850. Synonyms: 'Bigaareau des Vignes', 'Capucienen'. Ripens with several varieties of higher quality. References: 7, 10, 15, 16, 20, 55, 65.

'Flamentiner'. Origin: France?. Synonyms: 'Early Guigne', 'Türkine', 'Kunze', 'Bigarreau Blanc'. Two clones were received for the trial. Both ripen at the same time, and the fruits are much alike. But clone B had bigger and firmer fruits with a lower tendency to cracking, shorter fruit stalk, smaller leaves, and its season of flowering was later than that of clone A. It is not known, which one is true to name. The commercial value of both clones is doubtful. References: 14, 15, 27, 31, 33, 34, 35, 45, 47, 59, 62, 63.

'Fromms Schwarze Herzkirsche'. Origin: Germany ca. 1800. Synonyms: 'Fromm', 'Fromm Heart', 'Fromms Herzkirsche'. Ripens in a period when cultivars of higher quality are available. References: 7, 14, 22, 23, 31, 39, 45, 59.

'Frühe Meckenheimer'. Origin: Germany 1940. Synonyms: 'Meckenheimer Frühe', 'Mayrs Frühe Herzkirsche', 'Frühe Rote Herzkirsche' (30) It seems to be one of the best early season cultivars, and the trees are very fertile. It deserves further attention. References: 16, 26, 60, 62, 67.

'Frühe von Dobitschen'. Origin: Germany (54). Ripens at the same time as 'Early Rivers', but has not shown any better qualities. Reference: 16.

'Greening'. Origin: New York, USA (11). A very firm, late cultivar, which has not shown any remarkable qualities.

'Grosse Schwarze Herzkirsche'. An old cultivar of unknown origin. Synonym: 'Gemeine Schwarze Herzkirsche'. Probably other cultivars are grown under this name. The cultivar in this trial was no better than other cultivar of similar season. References: 16, 31, 32, 33, 44.

'Hauschilds Frühe Schwarze'. Origin: Germany. Small fruits and high tendency to cracking exclude it from cultivars to be recommended.

'Hoskins'. Origin: Oregon, USA, ca. 1880. Seedling of 'Napoleon' (31). The fruits are of very high quality and have a low tendency of cracking. However, very low tree fertility restricts its commercial prospects. References: 27, 28, 87.

'Hudson'. Origin: Geneva, New York, 1964. 'Oswega' x 'Giant' (83). The latest ripening of all tested cultivars. The fruit is firm, of good size and has only a slight tendency to cracking. Low fertility of the trees restricts its interest. References: 12, 16, 25, 39, 81, 84.

'Lamida'. Origin: Idaho, USA, 1946. Seedling of 'Lambert' (77). A late ripening cultivar of very high quality. However, an extremely high tendency to cracking restricts its value to dry regions. References: 8, 16, 25, 39, 88.

'Leucienkirsche'. Origin: Germany ca. 1800. Synonym: 'Guigne Carnee Winkler', 'Lucie', 'Winklers Weisse'. A light cultivar ripening with several other cultivars of higher quality. References: 7, 22, 23, 31, 34, 59.

'Mahognibär'. Origin unknown. A late cultivar with very firm fruits and with low cracking susceptibily, but unsatisfactory fruit size restricts its interest. Reference 1.

'Merton Late'. Origin: John Innes Inst., England 1962. 'Belle Agathe' x 'Napoleon' (35). The most outstanding qualities of this cultivar are

its early and heavy cropping and the high cracking resistent fruits. However, the light fruits are too small to have any great value for dessert. Reference: 36.

'Moreau'. Origin: France 1913. Synonyms: 'Souvenir des Charmes', 'Sandrin' (20), 'Schönheitskirsche', Äpfelskrische' (67). An early ripening cultivar with exceptionally large fruits for its season. Although the fruits have a very high tendency towards cracking and fruit set is rather low it may have some interest because of its large fruits. References: 3, 6, 15, 16, 29, 37, 38, 39, 62, 65, 76, 79.

'Poznanska'. Synonym: 'Büttners Czerwona', 'Büttners Rote Knorpel', 'Alterburger Melonenkirsche' (64). The results from this trial confirm that it is probably a synonym for 'Büttners', as discussed earlier. (19).

'Ranne Ljaskovska'. Origin: Lyaskovetz, Veliko-Tirnovo, Bulgaria (75). A very early, black cultivar with good fruit size for its season and a low tendency to cracking. Deserves further attention.

'Rebekka'. Origin: Jork, Germany, 1966. 'Rube' x 'Schubacks Frühe Schwarze' (47). Most qualitative characteristics are medium. May have some further interest. References: 16, 46, 61, 86.

'Schauenburger'. Origin: Switzerland. Synonym: 'Flurianer'. Very late cultivar with acceptable fruit size and low tendency towards cracking. The fertility has, however, been poor. References: 16, 39, 41.

'Schneiders Späte Knorpel'. Origin: Germany before 1861. Synonyms: Probably many cultivars are grown under this name. Example: 'Hausmüller', 'Kaiser Franz', 'Grosse Germersdorfer' (20), 'Grosse Germersdorfer' (40), 'Ochsenherz' (80), 'Pozna Schneidera' (64). It can hardly be destinguished from most trees grown as 'Ochsenherz'. It is generally accepted to be a late, very large, black fruited cultivar of high quality, not as fertile as 'Van', which ripens in the same season. The fruits are very susceptible to cracking. References: 3, 4, 16, 21, 29, 30, 38, 39, 45, 49, 59, 62, 63.

'Schrecken'. Origin: Germany before 1868 (45). A high tendency towards fruit cracking restricts interest, and it ripens at the same time as do several better cultivars. References: 16, 25, 27, 28, 56, 69, 70, 71, 72, 73.

'Souvenir des Charmes'. A commonly used synonym for 'Moreau', a name that should take precedence over 'Souvenir des Charmes'. See 'Moreau'.

'Spitze Braune'. Origin: Germany before 1790. Synonyms: Spitzkirsche' 'Erligheimer Spitzenbraune', 'Walheimer Spitzenbraune' (67). Ripens at the same time as 'Early Rivers' but has bigger and firmer fruits. It is supposed to be one of the best early cultivars in Germany (67). It deserves much interest. References: 7, 16, 20, 24, 30, 31, 52.

'Sue'. Origin: Summerland, Canada, 1954. 'Bing' x 'Schmidt' (50). A light cultivar whose major merits are, very high resistance to fruit cracking and very fertile trees. Although it ripens at the same time as several other good, light cultivars it deserves further interest. References: 9, 16, 69, 71, 72, 85, 87, 88.

'Teickners Schwarze Herzkirsche'. Origin: Germany 1937 (20). This cultivar is remarkable for its very high fertility. It ripens at the same time as 'Spitze Braune', which produces bigger and more cracking resistant fruits. May be of interest for its high productivity. References: 16, 29, 30, 43, 62, 67.

'Valera'. Origin: Vineland, Canada, 1968. 'Hedelfinger' x 'Windsor' It has a higher tendency to fruit cracking than even its very susceptible parent-cultivars. References: 16, 25, 74.

'Valeska'. Origin: Jork, Germany, 1966. 'Rube' x 'Stickmans Bunte' (49). A very high yielding, midseason cultivar. The fruits are medium of size and cracking tendency. May have commercial interest. References: 61, 86.

'Vega'. Origin: Vineland, Canada 1968. 'Bing' x 'Victor' (5). A very promising cultivar with light,large, firm, early mid-season fruits. The tendency to cracking is somewhat higher than other cultivars of similar season. The trees are fertile. References: 16, 25, 74.

'Velvet'. Origin: Vineland, Canada 1937. Unknown x 'Windsor' (78). Ripens at the same

time as good cultivars such as 'Sam' and 'Schmidt', therefore it hardly can find interest owing to a higher tendency to fruit cracking. References: 8, 16, 39, 45.

'Wolska Wczesna'. Origin: Poland ca. 1928. (64). Very much like 'Mureau', which ripen in the same early season, but the fruits are smaller and more resistant to cracking. The fertility of the trees is as poor as 'Moreau'. Reference: 2.

'Östads Röda'. Origin: Sweden before 1930. A very late firm cultivar. It does not seem to have as good characteristics as 'Merton Late', which ripens at the same time.

Conclusion

The main object of this work was to test never, and in Denmark unnoticed older cultivars for their qualitative characteristics. In this respect most importance is attached to season of ripening and fruit size, tendency to cracking, and firmness of the fruit.

A numercial description of the most important characteristics for identification purpose, as agreed upon by the »International Union for the Protection of new Varieties« (UPOV), is used in this work.

A large number of the cultivars tested in this trial may be considered superfluous in the assortment. But several cultivars have shown such important and desirable characteristics so that further experience is necessary before a final assessment of their orchard value can be made.

Of light cultivars 'Sue' and 'Merton Late' were outstanding for low tendency to cracking and high productivity. 'Vega' was of very fine quality with good tree fertility.

In the early season group the dark cultivars 'Ranne Ljaskovska', 'Frühe Meckenheimer', and 'Spitze Braune' had very valuable characteristics and deserve further trial.

In the mid-season group 'Rebekka', 'Valeska', 'Annabella', and 'Balsgård 20406' are the most promising cultivars. In the late season group 'Schneiders Späte' is still of commercial interest owing its extremely large fruits, but its high tendency towards cracking should be considered.

Acknowledgement

The author wishes to thank all those, who kindly have supplied propagation material (see page 148) and information about the cultivars.

Mr. Jörgen Jensen has rendered very valuable technical assistance with collecting and sumarizing the data. I am also very grateful to Mr. A.P. Preston, East Malling, England, for helpful assistance with a translation of the manuscript.

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Manuskript modtaget den 17. januar 1977.