2. Duran-Torrellardona, S. 1993. Melocotones, nectarinas y pavias. Portainjertos y variedades. Fundación La Caixa. 152 pp.
3. Egea, L., J. Egea-Caballero, T. Berenguer and J. E. García-García. 1984. Variedades de melocotonero autoctonas de la region de Murcia, Maruja, Jeromo y Calabacero. Caja de Ahorros Provincial de Murcia. 110 pp.
4. Espada-Carbo, J. L., R. Gella and J. Romero. 1991. Selección clonal y sanitaria de la variedad población 'Amarillos Tardios de Calanda.' Informaciones Tecnicas. Dirección General de Promoción Agraria. Diputacion General de Aragon. No. 25, 8 pp.
5. Rodríguez-Navarro, J., N. Castilla, A. Revilla and J. Gallego. 1989. Variedades de melocotonero de carne dura. Divulgación Técnica. Consejería de Agricultura, Ganaderia y Pesca. pp. 109.
6. Scorza, R., S. A. Mehlenbacher, and G. W. Lightner. 1985. Inbreeding and coancestry of freestone peach cultivars of the eastern United States and implications for peach germplasm improvement. J. Amer. Soc. Hort. Sci. 110:547-552.

**Fruit Varieties Journal 52(2):86-89 1998**

# Strawberry Varieties for Fresh Market in Denmark

O. VANG-PETERSEN[1]

## Abstract

Testing 9 varieties for the fresh market for 2 years yielded the results given here by measured yield and berry size and assessed taste and product quality of each variety. All varieties could grow successfully in Denmark. 'Honeoye' as an early productive variety with a good quality, and 'Onebor'(syn. 'Marmolada') as a productive mid season variety with a quality similar to 'Elsanta,' which had a lower yield. The late ripening varieties, 'Dania,' 'Pegasus' and 'Rhapsody,' had a medium quality. 'Rhapsody' was somewhat low in yield. The latest variety, 'Pandora,' produced a high yield and a medium quality.

## Introduction

Danish strawberry growers cultivates 'Zefyr,' 'Elsanta' and 'Dania,' but the growth habit and state of health is not satisfactory (1). 'Zefyr' (3) is prone to mildew, 'Elsanta' is prone to winter frost and 'Dania' (4) is in some years attacked by gray mold. Moreover 'Elsanta' is often without any taste, when harvested before ripening because of the bright and glossy appearance. To find more convenient varieties, these varieties were compared to others in a trial 1990-1991 (2). To continue this work on selecting new strawberry varieties for Danish conditions, nine varieties were investigated during 1993-1995.

## Material and Methods

The varieties were planted in the field during autumn 1992 on raised beds covered with plastic. All plants were trained at the institute and each plot consisted of 2 rows of 15 plants spaced 0.4 m apart and surrounding a drip irrigation line below the cover. There were 3 replications and plants in the row were spaced 0.25 m apart. Spacing between beds was 1.35 m, yielding 403.500 plants per ha. In 1993 all flowers were removed from the plants. During the growth season the plants were fertigated in dry periods. Approximately 3 mm of water per day was applied, and it contained 24.5 mg per litre of nitrogen. Fertilisation was controlled by leaf analyses each year. In order to ensure pollination in 1994, flowering, potted plants were placed in the field during the period, when 'Pandora' flowered. This was not necessary in 1995, as other varieties satisfactorily overlapped the flowering period of 'Pandora.'

The soil between the beds was kept clean by herbicides and the plants were sprayed against pests and diseases as recommended, especially during bloom against gray mold (*Botrytis cinerea*). The plants were protected by covering with Agryl (synthetic mulch) during the winter

1Research Centre Aarslev, Department of Fruit and Vegetables, Kirstinebjergvej 12, DK 5792 Aarslev.

**Table 1. Yield, quality and size of berries 1994 and 1995.**

| | Harvest time | | I.quality berries t per ha | | II.quality berries t per ha | | Berry weight grams | |
|---|---|---|---|---|---|---|---|---|
| | 1994 | 1995 | 1994 | 1995 | 1994 | 1995 | 1994 | 1995 |
| Avanta | 24/6 | 29/6 | 9.3 | 35.8 | 20.0 | 1.7 | 14.0 | 11.3 |
| Zefyr | 28/6 | 4/7 | 6.7 | 22.9 | 10.5 | 1.9 | 11.7 | 9.7 |
| Honeoye | 4/7 | 4/7 | 19.3 | 26.5 | 3.9 | 1.4 | 16.4 | 13.7 |
| Elsanta | 5/7 | 6/7 | 10.8 | 15.6 | 4.4 | 1.3 | 14.0 | 14.0 |
| Onebor | 7/7 | 11/7 | 24.6 | 25.3 | 7.3 | 2.2 | 17.0 | 14.4 |
| Pegasus | 8/7 | 11/7 | 19.8 | 33.2 | 4.0 | 2.8 | 15.0 | 12.1 |
| Dania | 11/7 | 12/7 | 30.6 | 27.1 | 8.0 | 5.9 | 12.7 | 9.0 |
| Rhapsody | 10/7 | 14/7 | 12.0 | 18.0 | 5.5 | 4.4 | 10.9 | 9.6 |
| Pandora | 17/7 | 19/7 | 26.6 | 35.7 | 4.0 | 3.2 | 14.7 | 10.5 |
| Sign | | | *** | *** | *** | *** | *** | *** |
| LSD95 | | | 10.0 | 11.4 | 5.7 | 2.0 | 2.5 | 1.8 |

period 1. November - 1. March in both cropping years.

At harvest yield, berry size, appearance, taste and overall commercial value were assessed at each picking time. The latter being the immediate impression of the berries as they appeal to the consumer. Berries lesser than 22 mm, infested with mildew, gray mold or misshapen are considered second class. The plants were also assessed for sensitivity against mildew, growth habit and runner production.

## Results and Discussion

*Flowering*

Period of bloom as days between 10 and 80 per cent open flowers, is shown on figure 1. Bloom was 10 days later in 1995 than in 1994. Most of the varieties are flowering in the same period but with 'Dania,' 'Pegasus,' 'Rhapsody' as later and 'Pandora' as the outmost late exceptions. For the latter it will often be necessary to add pollinators, as it has no stamens. The figures for time of flowering in 1994 clearly demonstrate, that neither of the other varieties in this investigation is capable of ensuring sufficient pollination of 'Pandora.'

*Yield*

Yield records are given in table 1 according to mean picking time, expressed as date of 50 per cent of the berries picked. The 2 varieties 'Avanta' and 'Zefyr' yielded a considerable amount of second quality berries in 1994, to some extent due to inconvenient spraying, and this was corrected in 1995. Compared to 'Zefyr' is 'Avanta' slightly earlier and 'Honeoye' slightly later. They yield more, larger and more regular shaped berries. In the mid season 'Onebor,' 'Pegasus' and 'Rhapsody' yield more than do 'Elsanta.' 'Onebor' gives larger, 'Pegasus' almost the same while 'Rhapsody' gives somewhat smaller berries. In the late season 'Dania' and 'Pandora' produced crops almost similar to each other, but 'Pandora' with far the largest berries.

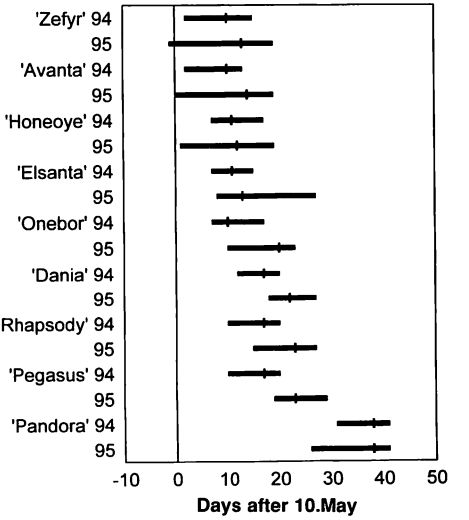



**Figure 1. Periods of bloom 1994 and 1995.**

**Table 2. Descriptions based on assessed berry characteristics.**

| | Berry size | Colour | Flavor | Sourness | Adherence of calyx | Commercial value |
|---|---|---|---|---|---|---|
| Avanta | medium | v. light orange | medium | strong | medium | poor |
| Zefyr | small | medium red | medium | strong | medium | poor |
| Honeoye | v. large | v. dark purple | good | medium | weak | good |
| Elsanta | large | medium red | good | weak | medium | medium |
| Onebor | v. large | dark purple | medium | medium | medium | medium |
| Dania | medium | light red | good | weak | medium | medium |
| Pegasus | large | dark red | good | weak | medium | medium |
| Rhapsody | medium | dark purple | good | medium | medium | medium |
| Pandora | medium | v. dark purple | medium | medium | medium | medium |

*Picking period*

Choice of varieties is often aimed at obtaining an even production during a long picking period. Figure 2 shows the period of ripening. It comprises the 50 per cent of the crop around the mean picking time. 'Avanta' and 'Zefyr' are early ripening varieties, 'Avanta' being the first by a few days. 'Honeoye' was considered an early variety. It was picked to the same date as the mid season variety 'Elsanta' in 1995 and only a few days earlier in 1994. It must therefore rather be classified as a mid season variety. The earliness of 'Honeoye' thus caused by a long, but early beginning picking period. To obtain a long and even maturity period the best varietal sequence seems to be 'Avanta,' 'Elsanta,' 'Dania' and 'Pandora.'

*Quality of the berries*

The berry size in table 2 is the average of the assessment of several samples and not a weighed, measured size as in table 1. 'Avanta' has small berries and 'Pegasus,' 'Honeoye' and 'Onebor' have large berries. The rest are considered medium sized varieties. It is assumed that berries, which are glossy and light red coloured are the most attractive to the consumers. 'Elsanta' in this investigation was not assessed until it developed dark colour as an attempt to improve quality by delaying harvest time. 'Elsanta' when picked light red has a lack of taste.

Several of the varieties might be useful under Danish conditions. Among these 'Honeoye,' 'Onebor' and 'Pegasus' ranks highest, followed by 'Elsanta,' 'Pandora' and 'Dania,' assessed as the overall appearance.

*Plant growth and health*

'Dania,' 'Pandora' and 'Pegasus' are strongly growing varieties producing large plants, compared to the rest. 'Avanta' and 'Zefyr' seem prone to mildew with heavy symptoms, while 'Dania' and 'Pandora' only had only minor symptoms at all. 'Avanta' did not produce many runners.

## Conclusion

All the varieties could be grown successfully. 'Honeoye' as a productive early variety with a good quality and without developing mildew as did 'Zefyr.' 'One-

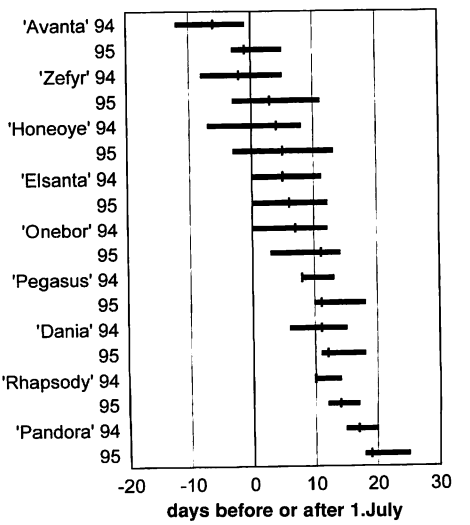



**Figure 2. Periods of picking 1994 and 1995.**

**Table 3. Plant growth, mildew attack and runner production, av. 1994-1995.**

| | Plant growth | Openness | Mildew | Amount of runners |
|---|---|---|---|---|
| Zefyr | 2.5 | 2.3 | 3.3 | many |
| Avanta | 3.0 | 3.3 | 3.7 | few |
| Elsanta | 3.0 | 3.0 | 2.0 | medium |
| Onebor | 3.0 | 3.0 | 1.3 | medium |
| Honeoye | 3.3 | 3.8 | 1.3 | many |
| Rhapsody | 3.3 | 3.0 | 2.0 | medium |
| Pegasus | 3.8 | 2.8 | 1.7 | medium |
| Pandora | 4.0 | 3.0 | 0.7 | many |
| Dania | 4.5 | 3.3 | 0.3 | many |
| 1 = | Weak | Dense | Little | |
| 3 = | Medium | Medium | Medium | |
| 5 = | Strong | Open | Much | |

bor' (syn. 'Marmolada') could be grown as a productive mid season variety with a medium quality compared to 'Elsanta' which had a lower yield but still seems without competition with its attractive bright and glossy appearance. 'Dania,' 'Pegasus' and 'Rhapsody' are late varieties with medium quality. The latter is somewhat low in yield. 'Dania' was the best late cultivar. 'Pandora' extends the picking season beyond 'Dania,' and has a high yield potential and medium quality. This variety needs attention on the pollination problem.

## References


1. Andersen, Helle and Thuesen, A. 1989. Evaluation of Strawberry varieties 1987-88. Tidsskr. Planteavl 93,349-358.
2. Kidmose, Ulla, Andersen, Helle and Vang-Petersen, O. 1996. Yield and quality attributes of strawberries cultivars grown in Denmark 1990-1991. Fruit Varieties Journal 50,160-167.
3. Thuesen, A. 1984. Sortsforsøg med jordbr 1978-79. Tidsskr. Planteavl 85, 234-244.


**Fruit Varieties Journal 52(2):89-91 1998**

# 'Leonense,' a Dual Purpose Peach Cultivar, Adapted to Southern Brazil

M.DO C. B. RASEIRA,[1] B. H. NAKASU,[1] J. FORTES[2] AND O. M. MARTINS[3]

The cultivar 'Leonense' has been released to provide the growers an option for commercialization in fresh market or industry. Besides it makes possible to produce better quality fruits, at lower cost, since this cultivar does not need to be sprayed for controlling bacterial leaf spot, caused by *Xanthomonas arboricola* pv. *pruni* (Smith, 1903; Vauterin, Hoete, Kersters & Swings, 1995).

In peaches, as in any crop, the price paid in the fresh market is higher than the one obtained for fruits for processing. However, there are years when production is greater than the fresh market demand and the grower needs to sell his fruits for the processing industry. Thus it is important to have dual purpose cultivars. On the other hand, it has good resistance to bacterial leaf spot one of the main disease problems in Southern Brazil.

## Origin

'Leonense' was selected among the second generation seedlings of a cross between a Brazilian cultivar, 'Brilhante,' and the American selection NJC97 (Fig. 1). 'Brilhante,' now obsolete, originated from a cross between 'Convênio,' a non melting, good quality peach, and the selection Pelotas 77 originated came from a cross of an open pollination of 'Cardeal,' a yellow, melting flesh peach for fresh market and 'Aldrighi,' an old local culti-

[1]Fruit Breeder, [2]Plant Pathologist, [3]Bacteriologist, respectively–Empresa Brasileira de Pesquisa Agropecuária–Centro de Pesquisa Agropecuária de Clima Temperado (EMBRAPA-CPACT), P.O. Box 403, Pelotas, R. S., 96002-970, Brazil.