

*Research Note*

**‘Suvetar’ and ‘Valotar’ – new strawberry cultivars**

Tarja Hietaranta

*MTT Agrifood Research Finland, Plant Production Research, Horticulture, Toivonlinnantie 518, FI-21500 Piikkiö, Finland, email: tarja.hietaranta@mtt.fi*

Päivi Parikka

*MTT Agrifood Research Finland, Plant Production Research, Plant Protection, FI-31600 Jokioinen, Finland*

The strawberry (*Fragaria × ananassa*) cultivars ‘Suvetar’ and ‘Valotar’ have been released from the breeding programme of MTT Agrifood Research Finland. Both new cultivars overwintered as well as the control cultivars ‘Jonsok’ and ‘Polka’. ‘Suvetar’ overwintered even better than ‘Polka’. ‘Suvetar’ was produced from the cross ‘Polka’ × ‘Emily’. It scored better than the control cultivars for sensory assessed skin resistance. Measured fruit firmness of ‘Suvetar’ was not significantly different from that of ‘Polka’, but was better than ‘Jonsok’. ‘Valotar’ originates from a cross between ‘Jewel’ and ‘Senga Sengana’. Its measured fruit firmness was better than that of ‘Jonsok’ and ‘Polka’. Considering sensory assessments, the good firmness seems to be largely due to good skin resistance. The fresh flavour, yield, fruit size and fruit appearance of ‘Suvetar’ and ‘Valotar’, together with improved fruit firmness, make both the new varieties suitable for the fresh fruit market.

*Key-words:* breeding, *Fragaria × ananassa*, fruit firmness, powdery mildew resistance, crown rot resistance

## Introduction

Strawberry (*Fragaria × ananassa*) is the most important cultivated soft fruit in Finland, and almost all of the production is for the fresh market. Currently the most widely grown cultivar for main season production is the Dutch cultivar ‘Polka’. The Ameri-

can cultivar ‘Honeoye’ and the Norwegian cultivar ‘Jonsok’ are grown for early production. In 1997 MTT restarted a strawberry breeding programme with a view to diversify current cultivar range.

The main traits of interest in the MTT strawberry breeding programme are resistance to powdery mildew (*Podosphaera aphanis* (Wallr.) U. Braun & S. Takam) and fruit firmness. A further fundamental

criterion is good adaptation to the Finnish climate. Combined with other desired characteristics, resistance to crown rot (*Phytophthora cactorum* (Lebert & Cohn) J. Schröt.) is also paid attention to. The breeding programme is based on classical variety breeding, and in the early stages it involved hybridisations of hardy and well-adapted foreign cultivars with powdery mildew resistant and/or firm fruit. Selection for powdery mildew resistance was done in the field under natural powdery mildew infection during all testing phases. Resistance to crown rot was evaluated in greenhouse tests of the advanced selected clones. Between 1997 and 2006 about 64 000 new hybrid seedlings were produced for selection. ‘Suvetar’ and ‘Valotar’ are the first cultivars to emerge from the new breeding programme.

## Material and methods

### Material origin and testing history

‘Suvetar’, tested as selection 97094043, was a seedling from a cross of ‘Polka’ × ‘Emily’. This cross was made at MTT Horticulture in Piikkiö in 1997. ‘Polka’ is a Dutch cultivar that has become the principal cultivar in Finland because of its good winter hardiness and good fruit quality (Matala 2002). ‘Emily’ is an English early cultivar released in 1995, which has rather firm fruit (Simpson et al. 1997).

‘Valotar’ originates from a cross between ‘Jewel’ and ‘Senga Sengana’ made at MTT Horticulture in Piikkiö in 1997. ‘Jewel’ is an American cultivar adapted to the North Eastern Great Lakes and Midwestern regions of the United States (Sandford et al. 1985). It is not winter hardy in Finland, but its fruits are large and the flesh and skin are firm. The old German cultivar ‘Senga Sengana’ was an important commercial variety until the beginning of the 1990s.

The initial selection of seedlings and further assessment in clone trials were made at MTT Horticulture in Piikkiö.

### Comparative trial

The comparative trial was established at MTT Horticulture in Piikkiö, in southern Finland (60°23’N and 22°33’E). The controls were ‘Jonsok’ and ‘Polka’, both important commercial cultivars. All the planting material was propagated at the institute by rooting runner plants taken from micro-propagated mother plants. The trial continued for three years.

The trial was established on 12<sup>th</sup> May 2003 on a slightly sloping field of sandy clay as a randomized complete block design with four replications. Each plot consisted of fifteen plants in total, planted in double rows in low drip-irrigated beds covered with black plastic mulch. The two rows in each double row were spaced 0.35 m apart and the planting distance in each row was 0.40 m. Spacing between the beds was 1.4 m. White-fruited, non-runner-producing and vigorous wild strawberry plants were planted between each plot and at the end of rows. The soil between the beds was grassed and kept flat by mowing.

The trial field was fertilised before planting in accordance with the soil test values. During the growing season, plants were drip irrigated. The irrigation was scheduled with the help of tensiometers so that the threshold for irrigation was -200 hPa. The fertigation was given via drip irrigation in 2004 and 2005 in several allocations, in an attempt to get good productivity and avoid over-luxuriant growth. In 2006 the trial was fertigated in early summer with granular fertiliser on the soil surface. In 2004, 2005 and 2006, the amount of fertigation was comparable with 0.47, 0.47 and 0.30 grammes of nitrogen per plant respectively.

In the planting year the plants were treated against crown rot with Aliette 80 WG (Bayer AG, Leverkusen, Germany) on 31<sup>st</sup> August. To allow better assessment of powdery mildew resistance, no sprays against powdery mildew (*Podosphaera aphanis*) were applied in 2005. Furthermore, only two of the three recommended sprays against grey mould (*Botrytis cinerea*) were carried out during the flowering season. These treatments were done with Switch 62.5 WG (Syngenta, Basel, Switzerland). Because of the restriction on use of Switch during the two following years, the grey mould

sprays in 2006 were done with Euparen M (Bayer AG, Leverkusen, Germany), a preparation that also has an effect on powdery mildew. Gusation (Bayer AG, Leverkusen, Germany) and Bioruiskute S (Yara, Oslo, Norway) were applied in both years to control pests.

## Harvest and growth assessment

Fruits were harvested twice a week and the quantities of marketable yield and discarded fruit were recorded. Fruits smaller than 25 mm in diameter, infested with powdery mildew or grey mould, misshapen or with damaged skin were considered non-marketable. Average fruit weight was determined at the beginning, middle and end of the harvest. Data were subjected to analysis of variance and harvests of different varieties were compared with the Tukey test. Analysis was performed using SAS/Mixed procedure (SAS Institute, Inc., 1999-2001 Cary, NC). Because of missing values the Tukey test for fruit size at the end of the harvest was not applied.

The earliness of the harvest was assessed by calculating the earliness index developed by Faedi (1988). The index was calculated by multiplying each picking day ordinal number by the yield of that day and dividing the sum of products by total yield. The means of earliness indices from three years were compared with the Tukey test.

Wintering ability was assessed by counting the dead, severely injured (more than half of the crowns lost), slightly injured (less than half of the crowns lost) and uninjured plants. These four categories were given coefficients between 0 and 1 at even intervals i.e. 0, 0.33, 0.67 and 1 respectively. A wintering index was calculated from the data.

Wintering index:  $(n_1/n \cdot 1.00) + (n_2/n \cdot 0.67) + (n_3/n \cdot 0.33) + (n_4/n \cdot 0.00)$ , where  $n_1$  is the number of uninjured plants,  $n_2$  is the number of slightly injured plants,  $n_3$  is the number of severely injured plants,  $n_4$  is the number of dead plants and  $n$  is the total number of plants.

Vole damage caused some difficulties for the assessment of winter injuries in 2006 in the first replication of 'Jonsok' and 'Polka', and in the first

and second replications of 'Suvetar' and 'Valotar'. The means of wintering indices from three years were compared with the Tukey test.

Other plant and fruit characteristics were evaluated using a 1 to 9 scale. Foliar powdery mildew resistance was assessed twice during the growing season, once before harvest and a second time after harvest. The other plant characteristics were assessed only before harvest. Fruit characteristics were evaluated by two persons twice during the harvest season; at the beginning and in the middle of the harvest period. Flesh firmness was assessed by biting (using mouth and teeth) and skin resistance by rubbing the fruits between fingers. Flavour, sweetness and sourness were evaluated by tasting. Fruit colour assessments were made with the aid of a 1 to 8 scale colour chart for strawberries (CTIFL strawberry color code for experimentation ends).

## Instrumental measurements

Fruit firmness and soluble solid content were assessed during 2005 and 2006, twice during each harvest season. The firmness of twenty berries of each cultivar, five from each of the four blocks, was measured by using an Effegi FT327 penetrometer equipped with a 11.3 mm diameter probe. Soluble solid content was measured with an Atago Palette 100 PR-101 refractometer (Atago Co., Ltd, Tokyo, Japan) from juice of 10 freshly-pressed fruits from each four blocks of each cultivar. The data were log-transformed prior analysis of variance.

Total acidity was measured by titrating a 5 ml juice sample with 0.1 N NaOH to pH 7.0 with a Schott TitroLine easy titrator (Schott Instruments GmbH, Mainz, Germany). The sample was pressed from ten fruits from each four blocks of each cultivar. Measurement was done twice during the 2006 harvest season. All the instrumental measurement data were subjected to standard analysis of variance for randomized complete block designs, where a block was considered as a normally distributed random effect. Analysis was performed using the SAS/Mixed procedure (SAS Institute, Inc., 1999–2001 Cary, NC).

## Screening for resistance to crown rot

‘Suvetar’ and ‘Valotar’ were screened for resistance to crown rot in a greenhouse in 2004–2006. Two different methods were used, the crown test and a test in circulating irrigation water i.e. nutrient film technique (NFT). Both varieties were tested twice with crown test and also twice using the NFT test. Runner plants from mother plants grown in a greenhouse were used in the tests. In the crown tests, runner plants with three to four leaves were used and inoculation of plants was done in small crown wounds with mycelium of *P. cactorum* cultivated on potato-dextrose agar (PDA) medium (Parikka 2003).

In NFT tests, runners with one small leaf were rooted in 5-cm rockwool cubes and the cubes with rooted plants were placed in the NFT. The irrigation water was circulated with a submerged pump: the water flow was about 4 litres/min. The Sporangia of *P. cactorum* were produced for inoculum on PDA-plates and added to the water tank of the NFT system (Parikka 2006).

The test time for the two techniques was four weeks and the temperature in the greenhouse was kept at 24 °C (day) and 18 °C (night) with a 16-hour day. The susceptible cultivar Jonsok was used as a control. After the test period, the plants were evaluated on 0–5 scale, where 0 denoted dead and 5 very good.

## Results and discussion

### Performance and description of ‘Suvetar’

‘Suvetar’ overwintered as well as ‘Jonsok’ and better than ‘Polka’ (Table 1). During the winters of the trial period both temperature and snow depth conditions were variable. The wintering capacity is evident also in harvest results (Table 2). The commercial yield of ‘Suvetar’ was equal to that of ‘Jonsok’ and ‘Polka’. The percentage commercial yield of total yield was better than for ‘Jonsok’ and ‘Polka’. With respect to proportion of grey mould infected fruits, ‘Suvetar’

Table 1. Wintering indices for four strawberry cultivars in 2004, 2005 and 2006.

Cultivar	Wintering index <sup>1</sup>			
	2004	2005	2006	Mean <sup>2</sup>
Suvetar	1.00	0.99	0.74	0.91 <sup>a</sup>
Valotar	1.00	1.00	0.64	0.88 <sup>ab</sup>
Jonsok	0.98	0.96	0.57	0.84 <sup>ab</sup>
Polka	1.00	0.86	0.57	0.81 <sup>b</sup>

<sup>1</sup>Score: 0-1 (0 all plants dead, 1 all plants uninjured).

<sup>2</sup>Means marked with the same superscript do not differ at  $p \leq 0.05$ , Tukey’s procedure.

did not significantly differ from either ‘Jonsok’ or ‘Polka’. In addition, there was no difference in occurrence of powdery mildew infected fruits (data not shown). In general, during the three-year trial only very few fruits with powdery mildew were detected. Fruit size of ‘Suvetar’ was larger at the beginning of harvest compared with that of control cultivars. The means over three years were 16.4, 13.5 and 14.2 grammes for ‘Suvetar’, ‘Jonsok’ and ‘Polka’ respectively. In middle and late harvest season there were no significant differences in fruit size between the varieties. The means over three years varied between 10.5–13.2 and 8.5–9.9 grammes for middle and late harvest respectively.

‘Suvetar’ is a midseason cultivar, ripening a couple of days earlier than ‘Polka’ and later than ‘Jonsok’ (Table 3). The fruits are attractive, regular, cordiform and have an attractive light green calyx. The calyx decaps as easily as that of ‘Polka’ (Table 4). Fruits are dark-bright red (blood-red) to cardinal-red and they have good gloss. Fruit flesh is lightly coloured. The achenes are at the surface or slightly embedded.

In trials ‘Suvetar’ had good scores for sensory assessed skin resistance: skin resistance was better than that of the control cultivars (Table 4). Measured fruit firmness scores did not differ significantly from those of ‘Polka’, but were better than those of ‘Jonsok’ (Table 5). The flavour of ‘Suvetar’ is light but pleasant and is somewhat more acidic than sweet. The titrable acid content and pH of fruit juice did not differ between ‘Suvetar’ and control varieties, but ‘Suvetar’, ‘Valotar’ and ‘Polka’ had higher total sugar content than ‘Jonsok’ (Table 5).

# AGRICULTURAL AND FOOD SCIENCE

*Hietaranta, T. & Parikka, P. 'Suvetar' and 'Valotar' – new strawberry cultivars*

Table 2. Commercial yield and percentages of commercial and grey-mould-infected strawberry fruit in 2004, 2005 and 2006.

Cultivar	Commercial yield								Grey mould infected fruit			
	g/plant				% of total yield				% of total yield			
	2004	2005	2006	Mean <sup>1</sup>	2004	2005	2006	Mean <sup>1</sup>	2004	2005	2006	Mean <sup>1</sup>
Suvetar	469	466	192	376 <sup>a</sup>	80	82	69	77 <sup>a</sup>	6	0.2	2	3 <sup>ab</sup>
Valotar	538	325	154	339 <sup>a</sup>	84	65	63	71 <sup>b</sup>	3	0.3	0.6	1 <sup>b</sup>
Jonsok	486	311	137	312 <sup>a</sup>	81	60	53	65 <sup>c</sup>	3	0.4	0.8	1 <sup>b</sup>
Polka	615	203	106	308 <sup>a</sup>	70	39	40	49 <sup>d</sup>	11	0.7	0.3	4 <sup>a</sup>

<sup>1</sup>Means marked with the same superscript do not differ at  $p \leq 0.05$ , Tukey's procedure.

Table 3. Harvest periods and earliness indices for four strawberry cultivars in 2004, 2005 and 2006.

	Harvest period			Earliness index <sup>1</sup>			
	2004	2005	2006	2004	2005	2006	Mean <sup>2</sup>
Jonsok	5 July – 5 Aug	7 July – 28 July	4 July – 18 July	201.9	196.8	192.6	194.9 <sup>a</sup>
Suvetar	1 July – 29 July	4 July – 25 July	4 July – 18 July	203.0	198.3	193.0	196.7 <sup>b</sup>
Valotar	5 July – 2 Aug	30 Jun – 25 July	4 July – 18 July	203.7	197.2	192.9	197.1 <sup>b</sup>
Polka	8 July – 12 Aug	4 July – 25 July	4 July – 18 July	209.4	198.3	194.3	198.9 <sup>c</sup>

<sup>1</sup>Earliness index by Faedi. The index is calculated by multiplying each picking day ordinal number by the yield of that day and dividing the sum of products by total yield. <sup>2</sup>Means marked with the same superscript do not differ at  $p \leq 0.05$ , Tukey's procedure.

Table 4. Means of scores for major strawberry fruit characteristics assessed at the beginning and middle of harvest seasons in 2004, 2005 and 2006.

Cultivar	Skin colour <sup>1</sup>	Flesh colour <sup>1</sup>	Glossiness <sup>2</sup>	Ease of calyx removal <sup>3</sup>	Flesh firmness <sup>4</sup>	Skin resistance <sup>4</sup>	Flavour <sup>5</sup>	Sweetness <sup>5</sup>	Acidity <sup>5</sup>
Suvetar	5.2	2.5	6.7	4.8	6.2	6.2	3.6	4.0	5.2
Valotar	4.8	3.5	6.0	4.5	6.5	7.2	3.3	4.2	4.8
Jonsok	6.6	4.0	5.5	6.3	4.8	5.2	3.6	3.8	6.8
Polka	6.6	3.7	4.7	4.4	6.0	5.0	3.9	4.2	4.1

<sup>1</sup>Score eight-point reference (8 dark wine-red, 7 wine-red, 6 cardinal red, 5 dark bright red (blood-red), 4 bright red, 3 brick red, 2 dark orange, 1 light orange red). <sup>2</sup>Score nine-point reference (9 very high, 7 high, 5 medium, 3 weak, 1 very weak). <sup>3</sup>Score nine-point reference (9 very easy, 7 easy, 5 medium, 3 difficult, 1 very difficult). <sup>4</sup>Score nine-point reference (9 very firm, 7 firm, 5 medium, 3 soft, 1 very soft). <sup>5</sup>Score nine-point reference (9 very high, 7 high, 5 medium, 3 weak, 1 very low)

Table 5. Fruit pH, titrable acid and total sugar content and measured fruit firmness for four strawberry cultivars in 2005 and 2006.

Cultivar	pH	Titrable acids (citric acid, g l <sup>-1</sup> )	Total sugar (°Brix)			Firmness kg		
			2005	2006	Mean <sup>1</sup>	2005	2006	Mean <sup>1</sup>
Suvetar	3.5 <sup>a</sup>	9.1 <sup>a</sup>	8.3	9.2	8.8 <sup>a</sup>	0.68	0.81	0.75 <sup>ab</sup>
Valotar	3.5 <sup>a</sup>	8.5 <sup>a</sup>	9.1	9.4	9.2 <sup>a</sup>	0.89	0.85	0.87 <sup>a</sup>
Jonsok	3.5 <sup>a</sup>	8.2 <sup>a</sup>	8.1	8.2	8.1 <sup>b</sup>	0.58	0.51	0.54 <sup>c</sup>
Polka	3.5 <sup>a</sup>	8.9 <sup>a</sup>	9.1	9.3	9.2 <sup>a</sup>	0.62	0.69	0.65 <sup>b</sup>

<sup>1</sup>Means marked with the same superscript do not differ at  $p \leq 0.05$ , Tukey's procedure.

Plants of ‘Suvetar’ are moderately vigorous and dense, comparable with ‘Jonsok’ and ‘Polka’, but the variety has a characteristic drooping growth. Leaves are light green. ‘Suvetar’ had fewer powdery mildew symptoms on leaves than ‘Jonsok’ and ‘Polka’. The mean powdery mildew resistance scores for leaves during the trial were 7.9, 5.6 and 6.5 for ‘Suvetar’, ‘Jonsok’ and ‘Polka’ respectively. Susceptibility to crown rot was comparable with that of ‘Jonsok’ in both crown and NFT tests and it can be considered very susceptible to crown rot (value 0.025). Runner production of ‘Suvetar’ is normal.

## Performance and description of ‘Valotar’

‘Valotar’ originates from a cross between ‘Jewel’ and ‘Senga Sengana’, made in 1997. It overwintered as well as the control cultivars Jonsok and Polka (Table 1). ‘Valotar’ was equal in commercial crop production to ‘Jonsok’ and ‘Polka’ (Table 2), and the percentage commercial yield of total yield was better than for ‘Jonsok’ and ‘Polka’. ‘Valotar’ and ‘Jonsok’ had less grey mould fruit infection than ‘Polka’, but they did not differ from ‘Suvetar’. Few powdery mildew infected fruits were detected during the three years of trial, and there was no difference in occurrence of powdery mildew infected fruits between ‘Valotar’ and the control cultivars (data not shown). The fruit size of ‘Valotar’ was the same as for control cultivars.

‘Valotar’ is a midseason cultivar, ripening a couple of days earlier than ‘Polka’ (Table 3) and later than ‘Jonsok’. Fruits of ‘Valotar’ are conic to long conic and are often necked. The light green calyx is often turned backwards. The calyxes de-cap about as easily as those of ‘Polka’ (Table 4). Fruits are dark-bright red, but in a cool and cloudy harvesting season the colour can be lighter and assume a shade of orange. Fruits are often glossy and fruit flesh is well coloured and deeper red than the fruit flesh of ‘Suvetar’. The achenes are elevated and yellow.

‘Valotar’ is a firm-fruited cultivar. Its measured fruit firmness was better than that of ‘Jonsok’

and ‘Polka’ (Table 5). When sensory assessments are considered, the good firmness seems to derive from good skin resistance (Table 4). The flavour of ‘Valotar’ is pleasant. Acidity and sweetness are well balanced. The titrable acid content and pH of fruit juice did not differ between ‘Valotar’ and the control varieties, but ‘Valotar’ and ‘Polka’ had higher total sugar content than ‘Jonsok’.

Plants of ‘Valotar’ are vigorous and moderately dense. Powdery mildew resistance is equal to that of ‘Suvetar’. The means scores for powdery mildew resistance of leaves during the trial were 7.9, 5.6 and 6.5 for ‘Valotar’, ‘Jonsok’ and ‘Polka’ respectively. Regarding crown rot resistance, ‘Valotar’ is intermediate or resistant. Its susceptibility (value 3.8) is comparable to that of ‘Senga Sengana’ in the crown test, and the cultivar can be considered resistant. In the NFT test it was more susceptible to *P. cactorum* (value 2.7), but can still be considered intermediate in resistance over the whole evaluation. Runner production of ‘Valotar’ is normal.

## Use and availability

‘Suvetar’ and ‘Valotar’ are adapted to southern Finland. Adaptability to more northern conditions was not demonstrated. The fresh flavour, yield, fruit size and fruit appearance of ‘Suvetar’ and ‘Valotar’, together with improved fruit firmness, suit them to the fresh fruit market. ‘Suvetar’ is susceptible to crown rot and should not be planted in soils infested with this pathogen. To avoid plant loss, planting material should be treated with a fungicide against crown rot. The varieties have been brought into MTT Horticulture at Laukaa for certified plant production, and material for nurseries will be available from 2008.

*Acknowledgement.* Technical assistance of Hilma Kinanen is gratefully acknowledged.

## References

- Faedi, W., Rosati, P. & D'Ercole, N. 1988. The strawberry breeding program for North Italy. *Acta Horticulturae* 265: 53–68.
- Matala, V. 2002. Strawberry variety trials on berry farms. *Acta Horticulturae* 567: 215–217.
- Parikka, P. 2003. Susceptibility of strawberry varieties to crown rot (*Phytophthora cactorum*). In: P. Hickleton, J. Maas (eds.) XXVI International horticultural congress: Berry crop breeding, production and utilization for a new century. *Acta Horticulturae* 626: 183–189.
- Parikka P. 2006. Screening for strawberry plant resistance to *Phytophthora cactorum* in Nutrient Film Technique (NFT) System. In: editor G. Waite. Proceedings of the fifth international strawberry symposium. *Acta Horticulturae* 708: 119–122.
- Sandford, J.C., Ourecky, D.K. & Reich, J.E. 1985. 'Jewel' strawberry. *HortScience* 20(6): 1136–1137.
- SAS Institute, Inc., 1999–2001 Cary, NC.
- Simpson, D.W., Bell, J.A. & Grabham, K.J. 1996. Progress in breeding strawberries for an extended season in the United Kingdom. *Acta Horticulturae* 439: 133–137.

## SELOSTUS

### 'Suvetar' ja 'Valotar' – uudet mansikkalajikkeet

Tarja Hietaranta ja Päivi Parikka

*MTT Kasvintuotannon tutkimus*

MTT on laskenut viljelyyn kaksi uutta mansikkalajiketta (*Fragaria* × *ananassa*), 'Suvetar' ja 'Valotar'. Molemmat uutuuslajikkeet ovat kokeessa talvehtineet yhtä hyvin kuin verranteet, 'Jonsok' ja 'Polka'; 'Suvetar' jopa hieman paremmin kuin 'Polka'. 'Suvetar' on peräisin Polka- ja Emily-lajikkeiden välisestä risteytyksestä. Kokeessa Suvetar-lajikkeen aistivaraisesti arvioitu marjan pinnan kiinteys oli parempi kuin kontrollilajikkeilla. Penetrometrillä mitatun marjan kiinteyden suhteen se ei eronnut merkittävästi Polka-lajikkeesta, mutta oli kiinteämpi kuin

'Jonsok'. 'Valotar' on Jewel- ja Senga Sengana -lajikkeiden risteytysjälkeläinen. Valotar-lajikkeen mitattu marjan kiinteys oli kokeessa parempi kuin Jonsok- ja Polka-lajikkeiden marjan kiinteys. Aistinvaraisen arvioinnin perusteella tämä kiinteys johtui suurelta osin marjan pinnan hyvästä kestävyydestä. Sekä Suvetar- että Valotar-lajikkeet soveltuvat viljeltäviksi Etelä-Suomessa. Soveltuvuutta pohjoisempiin olosuhteisiin ei ole testattu. Talvehtimistulosten ja marjan laatuominaisuuksien pohjalta molemmat lajikkeet soveltuvat tuoremarjatuotantoon.