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Study on Cherry Tomato in High Plastic Tunnel and in Trakya Conditions

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Abstract

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This study was realised in the production fields (plastic high tunnel) of Green housing Department of Trakya University Corlu Vocational High School, Tekirdag - Turkey. The experiment was set in a four times recurrence and according to the experimental design of randomly selected blocks. In the examination, 3 F_1 hybrid varieties (Somma F_1, Sweet 100 F_1, Sweet Million F_1) and 1 standard variety were used in the sowing time condition of April.

Somma F_1, Sweet 100 F_1 varieties are suggested for the region regarding total efficiency, fruit weight, and fruit diameter. For the variety of Somma F_1; the total yield was determined as 12.241.52 kg/da, fruit weight as 20.13 g and fruit diameter as 33.21 mm.
Key words: cherry tomato (*L. Esculentum Mill* var. *Cerasiforme*), efficiency

Introduction

As it is in the other parts of the world, not only the large-size fruited tomatoes (*Lycopersicum esculentum*) but also the varieties of small-size fruited tomatoes (*Lycopersicum esculentum* Mill *var. cerasiforme*) are grown in our country: Turkey. While large-size fruited tomato growing is being done in Trakya Region of Turkey, cherry tomato growing is not being conducted. According to the data of the year 2000; Turkey had realised 8,890,000 tons of tomato production that was 9 % of the world's total production. This production covers both large-size and small-size fruited (cherry) tomatoes. However, cherry tomato refers to a very small proportion (15).

Cherry tomato is a new concept for Turkey. Moreover, the vegetable is a very different product that can be listed in product diversification (Topbas, 1998). It is obvious and not argued that cherry tomato is the ancestor of today's culture tomatoes (Vural et al., 2000).

In the early times of tomato growing, red cherry tomato was the most known and grown product in the USA (Bassett, 1986). It can be seen that veins of the leaves returns to a shoot on the edge of flower bunch in large-size fruited tomato

plant (Sevgican, 2002). The same event was also met in this research. Yellow, red and pink coloured fruits of cherry tomato were met depending on the varieties (Anonymous, 1996). It is also found in the varieties that are named as determinate, indeterminate and semi-determinate. Indeterminate variety of tomato differs from determinate variety, as it does not end its vegetative growing and fruit production until it dies of frost in winter. Its last shoot can grow up to 3 - 3.5 m. The production can be done with 1 - 3 stems for the plant. All other branches, which come from the armpit of leaves, are broken and thrown away. When the plant reaches to 33.5 cm of height, it is hang suspensor in order to easily carry the plant itself and its fruits (14). In cherry tomatoes depending on the varieties, harvesting can either be done fruit by fruit or by bunch as in bunch of grapes. Beta-carotene, which is the main sign of Vitamin A, is found 2 - 10 mg in 100g of Lycopersicums and its highest amount is met in the varieties of cherry tomato (13). In some varieties sugar content reaches up to 12 - 14 % which is very important for its propriety that there would be no need to add sugar in the production of tomato paste, ketchup and tomato juice (Anonymous, 1988). Cherry tomato some varieties of which are used for salads, sauces, ketchup and pickles is also grown in flower pots and in the gardens of houses as a decoration plant (Ege, 1936).

Trakya Region is a geography where the great metropolis of Istanbul, the Province of Tekirdag and the frontier Provinces of Edirne and Kirklareli are located. The vegetable of cherry tomato can be easily marketed from the region to the inner parts of the country or domestically and can be even exported abroad. In the recent years, vegetable growing in high tunnel without heating has been rapidly developed in the region. Among the vegetables grown in high tunnel, cherry tomato can be evaluated in this region.

The objective of this study is to place cherry tomato, which is mostly used as garniture in the region, in the market earlier than field tomato; to have it known and sustain in the market; to determine the most convenient variety for the region and to suggest it for the producers.

Material and Method

This research was realised in the production fields (plastic high tunnel) of Green housing Department of Trakya University Corlu Vocational High School, Tekirdag - Turkey. For plant material; Somma F_1, Sweet 100 F1, Sweet Million F_1 and a standard variety was used for the research.

The characteristics of the varieties are given as a whole in Table 1 according to the reference Anonymous, 2004 (2). The sowing time is the month of April for the varieties used.

At the beginning, the seeds of cherry tomato were sown in cases pierced with many holes and with two seeds for each hole. Then, on the 5th of May 2004; the seedlings of cherry tomato were planted in PE bags, which were filled in with peat and those of which the closed dimensions were 15x15 cm, and the thickness was 0.15 mm; which were black coloured in order not to be covered with moss; and which had drainage holes for irrigation. Ten plants per parcel were used and they were planted into their essential places at 60x40 cm distances in the rows and on the rows respectively and with border plants on the 13th of May 2004.

During the months when the research was being conducted, the average tem-

Table 1

Characteristics of the varieties

Variety	Characteristics
Somma F_1*	A medium and early maturing variety; has red coloured fruits; tastes and smells good; has a thin skin; the diameter of the fruit can reach up to 2 – 2.5 cm; and the fruit is bunch formed.
Sweet 100 F_1*	A medium and late maturing variety; has an indeterminate characteristics; has red coloured fruits; tastes and smells strong; has a thick skin; the diameter of the fruit can reach up to 2.5 cm; and the fruit is bunch formed.
Sweet Million F_1*	A medium and late maturing variety; has an indeterminate characteristics; has red coloured fruits; tastes good and smells strong; has a skin with medium thickness; the diameter of the fruit can reach up to 2 – 2.5 cm; and the fruit is bunch formed.
Standard	A late maturing variety; has light red coloured fruits; tastes and smells very strong; has a thick skin; the diameter of the fruit can reach up to 1 – 1.5 cm; and the fruit is bunch formed.

* Anonymous, 2004 (2).

perature was 17.7 °C, the average rainfall was 45.3 (mm), the average proportional humidity was 68.2 (%) and the average wind speed was 2.1(m/s).

The production plan of the experiment occurred as below:

Sowing Date :2nd of April 2004
Transplanting Date :5th of May 2004
Planting Date :13th of May 2004
First Armpit Cutting and Hanging on Suspensor :25th of May 2004
First Harvesting :1st of July 2004
Total Harvesting :20 times

The cherry tomatoes were irrigated by adding 8 - 10 g of Captan, which is a fumigant, per 10 litres of life water after sowing, transplanting and planting. The irrigation was supplied a filtered bucket during the seedlings period and by drip irrigation method in the development period. On the basis of the principle that the tomato seeds are rapidly germinating in the dark; the cases, which were pierced with many holes, were covered with newspaper after sowing until seed germination.

Before sowing, the soil of the green house had been analysed. According to the results of the analysis, the soil was supplied with burnt and sifted farm manure.

Cultural applications were executed conveniently to available techniques from the beginning up to the end of the production.

The experiment was set in a four times recurrence and according to the experimental design of randomly selected blocks (Duzgunes et al., 1987). A total of 40 plants from each variety were used in the experiment and 160 plants were evaluated.

Findings and Discussion

Fruit Weight

According to the fruit weight (g), the differences within the varieties were found to be 1 % important. The heaviest fruits were obtained from the variety of Somma F_1 as 20.13 g and followed by Sweet 100 F_1 and Sweet Million F_1 (Table 2).

Fruit Diameter

According to the fruit diameter (mm), the differences within the varieties were found to be 1 % important. The fruits with the largest diameter were obtained from the variety of Somma F_1 as 33.21 mm and followed by Sweet 100 F_1 and Sweet Million F_1 (Table 2).

Table 2

Fruit weight (g) and diameter (mm) of the varieties

Varieties	Fruit weight, g	Fruit diameter, mm
Somma F_1	20.13 a	33.21 a
Sweet 100 F_1	9.04 b	27.04 b
Sweet Million F_1	8.73 bc	25.20 bc
Standard	8.42 c	22.60 c
LSD	3.41 (LSD %1)	3.12 (LSD %1)

Table 3

Total efficiency (kg/da) of the varieties

Varieties	Total efficiency, kg/da
Somma F_1	12.241.52 a
Sweet 100 F_1	10.324.32 bc
Sweet Million F_1	1.145.40 b
Standard	5.211.29 c
LSD %1	772.50

Total Efficiency

The highest efficiency was obtained from the variety of Somma F_1 as 12,241.51 kg/da and followed by Sweet Million F_1 and Sweet 100 F_1 (Table 3).

Germination Date

The germination dates of the varieties are given on Table 4. The variety with the earliest germination was Somma F_1 and the variety with the latest germination was Standard variety (Table 4).

Blossoming Date

As it is seen on Table 4, Somma F_1 had the first blossoming date as 14th of June 2004. The latest variety in blossoming was Standard variety as 21st of June 2004 (Table 4).

Maturing Period

The earliest maturing variety to harvest was Somma F1 with a maturing period of 62 days and the latest maturing variety to harvest was Standard variety with a maturing period of 69 days (Table 4).

Table 4

Sowing, germinating, transplanting, planting, first blossoming and first harvesting dates and maturing periods of the varieties

Varieties	Somma F_1	Sweet 100 F_1	Sweet Million F_1	Standard
Sowing Date	08 April 2004	08 April 2004	08 April 2004	08 April 2004
Germinating Date	13 April 2004	15 April 2004	17 April 2004	14. April 2004
Transplanting Date	05 Май 2004	05 Май 2004	05 Май 2004	05 Май 2004
Planting Date	13 Май 2004	13 Май 2004	13 Май 2004	13 Май 2004
First Blossoming Date	14 June 2004	18 June 2004	17 June 2004	21 June 2004
First Harvesting Date	01 July 2004	01 July 2004	03 July 2004	02 July 2004
Maturing Period (day)	62	64	63	69

The Ratio of Dry Material Solvable in Water, %

After analysing the ratios of dry material solvable in water within the varieties: the variety of Somma F_1 referred to group a as 6.73 %. The variety with the lowest percentage was Standard variety. The other varieties were in the between group (Table 5). For a delicious tomato, the ratio of dry material/acid should be 10/1 and the ratio of dry material solvable in water should be higher than 6 % (Urkmez, 1996). The varieties of Somma F_1, Sweet Million F_1 and Sweet 100 F_1 gave respectively the proof of the above-mentioned fact.

pH

Standard variety referred to group a: with its 3.92 value after the evaluation of pH values within the varieties. The variety with the lowest pH ratio was Somma F_1 as 3.64 and the other varieties were in the between group (Table 5).

Table 5

The ratios of dry material solvable in water (%) and pH values of the varieties

Varieties	The ratio of dry material solvable in water, %	pH
Somma F_1	6.73 a	3.64 c
Sweet 100 F_1	6.39 abc	3.79 bc
Sweet million F_1	6.50 ab	3.85 ab
Standard	5.50 c	3.92 a
LSD %1	0.57	0.11

Conclusion

The fact that the adaptation abilities for the varieties of Somma F_1, Sweet Million F_1 and Sweet 100 F_1 respectively were high, was determined by this research which was conducted in Trakya - Turkey conditions; in high plastic tunnel; with the sowing time of April; and using four varieties as Somma F_1, Sweet 100 F_1, Sweet Million F_1 and standard variety. As a conclusion of the study, the varieties of Somma F_1 and Sweet 100 F_1 were suggested for the region according to fruit weight, fruit diameter, total efficiency, the ratio of dry material solvable in water, and pH value. However, a fruit-cracking problem, which was high for Somma F_1 and moderate for Sweet 100 F_1, occurred during the production. Due to this result more attention is required while the product is being marketed.

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