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COMPARISON OF INTRODUCED AND LOCAL STRAWBERRY VARIETIES (*Fragaria ananassa* DUCH.) IN RELATION TO YIELD, VITAMIN C CONTENT, SOLUBLE SOLIDS, AND STORAGE LIFE.

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ABSTRACT

Six introduced strawberry varieties, Missionary, Pocahontas, Sparkle, Armore, Dixieland, Tennessee Beauty, and a local variety (Atabaky) were compared for total yield, soluble solids, vitamin C content, and storage life in a randomized complete block design. Missionary had the highest yield and Atabaky the lowest. Tennessee Beauty had the lowest vitamin C, but the longest storage life, and Atabaky had the lowest soluble solids. Positive correlation (r=0.46) was found between yield and soluble solids.

In spite of growing demands for strawberries in Iranian markets, there are not adapted varieties to meet these demands, both in quantity and quality. However, in recent years attempts have been made to improve the situation by introduction of new varieties and improvement of cultural methods for this crop.

Breeding work has been carried on strawberries for high flavor, better shipping qualities, disease resistance and high yields (2,8). Efforts are being made to breed hardier, still larger, and more productive varieties with good flavor, firm skin and flesh, and attractive color (3,6). Strawberry varieties differ greatly in their soluble solids and vitamin C content (4). Vitamin C content of strawberries is relatively high and varies with temperature, light and variety (1).

To meet these demands, foreign strawberry varieties should be tested locally for

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their yield, quality, and adaptability before their introduction. The objectives of this experiment were to select high yielding strawberry varieties, with good qualities such as high vitamin C content, more soluble solids, and longer storage life of the fruits under local conditions.

MATERIALS AND METHODS

In 1968 a preliminary experiment on ten varieties of strawberries was undertaken. During this study, notes were taken on disease symptoms, flowering dates, yield, and vigor of the plants by giving numerical values form 1 to 5 (1 being the strongest and 5 the weakest). Five berries of each variety at every picking time were measured for their soluble solids using a hand refractometer. Determination of vitamin C content was made on 100g of fruit juice of each variety at every picking time as described by Jacobs (5).

In 1969, on the basis of the previous year's data, seven varieties (Missionary, Pocahontas, Sparkle, Armore, Dixieland, Tennessee Beauty and Atabaky) were selected for further studies. The selected varieties were compared in a complete randomized block design with four replicates. Runners of each selected varieties were planted by hand in March 10, 1969. Each plot consisted of 6 rows, 20m long with 50cm between two rows, and plants were spaced 35cm apart on the row. At harvest time, only the four middle rows were used for collecting data, discarding two terminal plants. Broadcast application of manure and superphosphate were made at the rate of 20 tons and 150 kg/ha, respectively, in the previous fall. Urea was applied as a band at the rate of 150 kg/ha in the spring. The soil of the experimental site was silty clay loam, and the experimental plots were irrigated weekly during the growing season. The plots were protected by means of straw mulch during winter and the mulch were removed early in the spring of 1970, soon after growth started. Picking was started in May 1970, when the berries were completely red in color. Following every harvest, the amount of vitamin C, and soluble solids were determined as described for 1968.

Fruit samples (baskets of 500g) of each variety were kept in a refrigerator at 4 C in order to investigate their keeping quality. The fruits were inspected every day for first symptoms of diseases caused by low temperature fungi such as *Botrytis cinerea* Persoon and *Phytophthora cactorum* (Lebert & Cohn) Schroeter, the causual agent of gray mold and leather rot, respectively.

RESULTS AND DISCUSSION

The data obtained for yield, vitamin C content, and soluble solids for seven varie-

ties of strawberries which are compared with Duncan's Multiple Range Test (7) are shown in Table 1.

Table 1. Yield, vitamin C content and soluble solids of seven varieties of strawberries grown under natural conditions.

Variety	Yield[1] kg/ha	Vitamin C[1,2] mg/100 g	Soluble solids %
Missionary	9090 a[3]	115.7 a	12.1 a
Pocahontas	6553 b	108.6 a	12.2 a
Sparkle	6331 b	93.7 b	11.9 a
Armore	6084 b	96.8 a	11.0 a
Dixie land	4984 b	112.6 a	10.4 b
Tennessee Beauty	4712 b	91.5 b	12.1 a
Atabaky	2772 c	115.3 a	10.1 b
C.V.	14.28%	8.75%	8.45%

[1] Mean of 12 pickings.
[2] Mean of 5 samples at each picking.
[3] Means followed by the same letter are not significant at the 5% level; determined by Duncan's Multiple Range Test.

All the introduced varieties were significantly superior to the local variety as far as yield was concerned. Missionary had the highest yield (9090 kg/ha) and Atabaky the lowest (2772 kg/ha). Tennessee Beauty had the lowest amount of vitamin C (91.5 mg/100g). As far as percentage of soluble solids is concerned, all of the introduced varieties, except Dixieland were superior to the local variety (Table 1).

As shown in Figure 1., Tennessee Beauty had the longest (13 days) and Atabaky the shortest storage life (5 days).

On the basis of this study, Missionary had the highest yield and vitamin C content, high soluble solids, and relatively long storage life. Therefore it is recommended that it replace the local variety at Bajgah.

There was a correlation between yield and percentage of soluble solids (r=0.46). However, no correlation was found either between yields and vitamin C content or between vitamin C content and soluble solids.

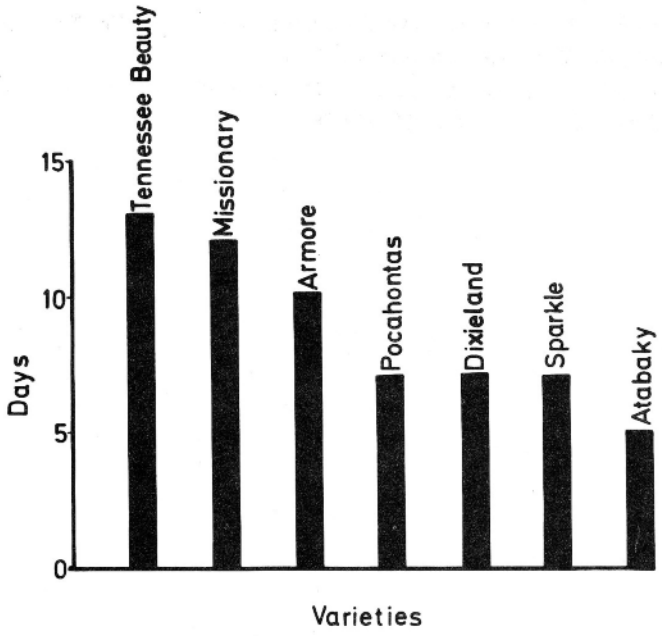

Fig. 1. Storage life of seven varieties of strawberries stored at 4°C.

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