

# Effect of some cultural treatments on storage ability of some tomato cultivars

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Six recently introduced cultivars; Peto 86, UC 97-3, Castle Rock, Flora Dade, Pakmor and VF 145-B (which was used as standard variety) were evaluated under three different planting dates (Jan. 1st, Jan 15th and Feb. 1st) of the early summer seasons of 1988 and 1989. Data included vegetative growth, flowering behaviour, yield and fruit quality characters. The obtained results can be summarized as follows:

- 1-Pakmor cv. possessed the largest vegetative growth followed by Flora Dade and both cultures proved to be of semi-determinate growth. VF 145-B and Castle Rock were intermediate while the least values were connected by Peto 86 and UC 97-3 cvs. and these latter four cultivars were of determinate growth. Vegetative growth features were increased with delaying planting date. The highest values were connected with the late planting (Feb. 1st).
- 2-Concerning flowering behaviour, results indicated that Peto 86 was the earliest flowering cultivar, bore the first cluster at a lower internode on the main stem and exhibited the highest fruit-set percentage followed by UC 97-3 and Castle Rock. Meanwhile, Flora Dade and Pakmor were the latest flowering cultivars. The standard cv. VF 145-B lies in between in this respect. Late planting (Feb. 1st) induced the shortest flowering time and reflected the highest fruit set percentage.
- 3-The maximum values for either early or total yield and their ratio as well as marketable yield were obtained by Peto 86 followed by UC 97-3 and Castle Rock, whereas the least yield parameters were obtained by Pakmor and Flora Dade. VF 145-B showed intermediate values. Generally, yield and its components of all used varieties were increased with delaying the planting date. Thus the maximum values of early, total and marketable yields were obtained by Peto 86 cv. when transplanted on Feb. 1st.
- 4-Tested cultivars show great variations in the physical characteristics of their fruits. Peto 86 and UC 97-3 are considered as small fruited (< 100 g), Castle Rock and VF 145-B as medium fruited (100-120 g), Flora Dade as large fruited (140-150 g) and Pakmor as extra large fruited (> 190 g). Shape of fruits from the tested cultivars was oblong (S.I. > 1.40) for Peto 86 and Castle Rock, somewhat round (S.I. 1.06-1.08) for UC 97-3 and VF 145-B, Slightly flattened (S.I. 0.9) for Flora Dade and flattened (S.I. 0.07) for Pakmor. Flesh thickness ranged from 3 mm for Pakmor to 7 mm for Peto 86. Number of locules ranged from 2 for Peto 86 and UC 97-3 to 7 for Pakmor. Fruits of Castle Rock are being the firmest followed by those of Peto 86 and those of Pakmor being the softest. Fruits of Pakmor and Flora Dade are juicy and those of Peto 86 are the most fleshy ones followed by UC 97-3, Castle Rock and VF 145-B. As for the effect of planting date, fruit size was increased with delaying planting date, whereas shape index, number of locules and fruit firmness showed no response to planting date. Generally, it was proved that the effect of cultivar on the studied physical fruit properties was more pronounced than the effect of planting date.
- 5- Chemical characteristics were obviously different due to cultivars. Compared with the standard variety VF 145-B, fruits of Peto 86, UC 97-3 and Castle Rock were of higher dry matter, vitamin C and titratable acidity contents, whereas Flora Dade and Pakmor were of lower values in this respect. The chemical constituents ranged from 5.15 to 7.80% for dry matter content; 23.9 to 31.5 mg/100 g for vitamin C; 380 to 566 mg/100 g for titratable acidity and 4.76 to 6.59% for T.S.S. The lower and higher values, in all these ranges, were for Pakmor and Peto 86 cvs., respectively. The mentioned fruit chemical constituents were significantly increased with delaying the planting date. The highest values were connected with the late planting (Feb. 1st).

The first storage study: Fruits of the six used cultivars, harvested from

medium planting (Jan. 15th) and late planting (Feb. 1st), at green mature stage were stored at normal room ( $33\pm 2^{\circ}\text{C}$  and 65- 75% R.H.) and cold room ( $10\pm 1^{\circ}\text{C}$  and 85-90% R.H.) in carton boxes of 5 kg weight. Samples were taken to determine the physical and chemical properties at 8 days intervals. The obtained results were:-1- A continuous increase in decay and loss in weight percentages associated with a continuous reduction in fruit firmness happened in the stored fruits. Such deteriorations were higher at normal rooms than at cold ones. Compared with the standard cv. VF 145-B, the three cultivars Peto 86, UC 97-3 and Castle Rock proved to be of better storage ability as detected by the lower decay and weight loss percent as well as higher firmness values, whereas Pakmor and Flora Dade were of the worst storage ability. As for the effect of planting date, decay and loss in weight during storage were more pronounced in fruits harvested from the early planting (Jan. 15th) than those of the late planting date (Feb. 1st).2-Although dry matter content was gradually decreased throughout the storage period at room temperature, it increased at the beginning of storage followed by decline in last periods at cold rooms. The reductions in dry matter content were not the same for the tested varieties. After 24 days storage at normal room, dry matter content DROPPed from 7.73 to 5.70% for cv. Peto 86 and from 5.15 to 3.07% for Pakmor. Moreover, the reductions were higher at room temperature than at cold storage and in fruits harvested from early planting than those from late one.3-Fruit T.S.S. content increased initially then decreased till the end of storage periods. The maximum increase peak occurred in fruits of Peto 86 after 8 days at room temperature and 16 days at cold storage. Meanwhile, the reductions at the last storage periods were not the same for the different tested varieties, storage conditions and planting dates. Such reductions happened at a more rapid rate in fruits of cvs. Pakmor and Flora Dade than those of the other cultivars as well as in normal room than in cold one and in fruits harvested from the early planting than those from the late one.4-There was an accumulation in total sugars in fruits of the most tested cultivars at the beginning of storage followed by a gradual decrease till the end of storage period. The response of such reductions to different used treatments followed nearly the same pattern of the response of T.S.S.5-Titratable acidity in fruits of tested cultivars increased initially then decreased till the end of storage periods. The maximum increase peak occurred in fruits of UC 97-3 after 8 days at normal room and 16 days storage at cold one. At the last storage periods, the reductions were higher at room temerature compared with cold storage and in fruits harvested from early planting than from late one.6-There was an increase in vitamin C content at the beginning of storage in fruits of all tested cultivars up to 8 days at normal rooms and 16 days at cold storage followed by a decline in the last periods. Fruits of cv. Peto 86 kept the highest concentrations of vitamin C all over the storage periods followed by cvs. UC 97-3 and Castle Rock. The changes in vitamin C during storage were higher at normal room than at cold one. Fruits harvested from late planting kept higher concentrations of vitamins C during storage than those of late planting. Fruits from cvs. VF 145-B, Flora Dade and Pakmor which proved to be of the worst keeping quality, were dipped for 5 minutes in solutions of Tecto at 250, 500 or 1000 ppm; Rovral at 250, 500 or 1000 ppm and Bavistin at 100, 200 or 300 ppm then stored under cold storage ( $10\pm 1^{\circ}\text{C}$  and 85-90% R.H.) in carton boxes of 5 kg. The main results obtained from the preservatives were as follows:-1-All used concentrations of the three tested preservatives were effective in minimizing the decay percentage. The most effective treatments were Tecto at 1000 ppm and Bavistin at 100 ppm which reduced decay by about 50% compared with the untreated fruits.2-Treating fruits with Tecto at 1000 or 500 ppm and Bavistin at 100 ppm decreased the loss in weight whereas treating with Rovral showed no effect in this respect.3-Treating fruits with Tecto at 1000 ppm kept the fruits more firmer during storage compared with untreated samples. However no obvious trend could be detected in favour of treatment with Rovral or Bavistin.4-Dry matter content in fruits was increased by treating fruits with Tecto at 500 or 1000 ppm and Bavistin at 100 ppm but was decreased as result of treating with Rovral at 250 or 1000 ppm.5-Fruits of cv. VF 145-B showed the least decay and loss in weight percentage as well as the firmest and kept the greatest dry matter content during the whole storage periods. Contra trend was detected in case of cv. Pakmor. Fruits of Flora Dade cultivar lie in between in this respect.6-It is not advisable to store preservative treated fruits more than 32 days in cold storage. from the foregoing discussion, it can be generally concluded:1-As for yielding capacity, fruit quality and storage ability required for exportation, cv. Peto 86 ranks first among all tested

recent cultivars followed by UC 97-3, meanwhile Castle Rock ranked third in this respect.2-Planting on Feb. 1st is recommended for the early summer plantation.3-Holding fruits at cold storage of 10°C and 85-90% R.H. decreased decay, weight loss and softening and helped maintain better physical and chemical properties of tomato fruits.4-Dipping fruits for 5 minutes in solution of Tecto at either 500 or 1000 ppm or Bavistin at 100 ppm improved the storage ability of tomato fruits and gained more longer storage periods.5- Mature-green tomatoes can be stored without any decay incidence and at acceptable quality for 8 days at normal rooms (33°C) and 16 days at cold rooms. Application of the recommended preservatives prolonged the keeping quality up to 4 weeks under cold conditions.