RESULTS AND DISCUSSION

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I-Effect of harvesting methods on decay % of Meet-Ghamr peach fruits:

Three methods were used for picking fruits from trees, i.e. shaking the tree, shaking the tree plus puting a mat under the tree, and harvesting by turning the fruit round by hand using plastic buckets and ladders. It is clear from Table (2,3) and Fig. (1,2) that shaking the tree exhibited more decay in comparison with the other two methods. Puting a mat under the tree highly reduced the decay percentage, especially bruises. On the other hand, a considerable decrease in mechanical injury occured when the third method was adopted. Turning the fruit round resulted in a clean separation from the pedical and no injury occured. The plastic bucket also reduced enjury because it has smooth walls. No bruises occured in the third method in both seasons, while punches and cuts were considerably reduced or eliminated. These results are in agreement with the finding of Foad (1984). In addition, according to Gerdts and LaRue (1976) peaches and nectarines are subjected to harvest injury, and the fruit must be picked carfully to prevent cuts and bruises. They found that this could be accomplished by hand picking of fruits from trees and placing them in buckets with padded bottom liners .

II-Effect of different kinds of transporting containers on decay % of Meet-Ghamr peach fruits:

Table (4) and Fig.(3) show the effect of different kinds of transporting containers, i.e. palm crate, palm crate with carton liner , plastic buckets and plastic boxes on the decay percentage of Meet-Ghamr peach fruits in the two successive seasons during transportation from Meet-Ghamr area to the faculty of agric., Cairo University. Four kinds of decay were found at destination, i.e. abrasions, punches, scratches and cuts. The presented figures abviously show that the palm crate, with its sharp edges and coarse surfaces, caused more pronounced damage to the fruits, as compared with the other containers used in this investigation.

Regarding the modified palm crate with card board liners , it proved to be more promising in reducing fruit decay. This modification removed the coarse palm crate to a smooth card board box from inside, strengthened with the palm ribs from outside. This formula resulted in better protection against mechanical injury and reduction in decay percent.

As for the plastic containers, i.e. plastic buckets and plastic boxes, they were obviously better than the palm

crate. When compared with the modified palm crate (with liners), the results were about to be the same. In addition, both modified crates and plastic containers showed no cuts, and little percentage of punches, in addition to considerable reduction in abrasions and scratches. On the other hand, no considerable difference was noticed between the plastic buckets and the plastic boxes, but the plastic buckets seem to be more promising in reducing abrasions, punches and scratches. This may be due to the smaller size of the plastic bucket (about 7-8 kg).

Regarding the 2nd season, a similar trend was observed in the majority of the results obtained (Table 5 and Fig. 4).

These results are in egreement with the results obtained by Foad (1984) on apples. They are also similar to the results of Gerdts and LaRue (1976) on peaches and nectarines.

III-Effect of the picking stage on the keeping quality of fruits:

1- Effect of the picking stage on the physical properties during storage of Meet-Ghamr peach fruits under 0oC:

From Tbale (6) and Fig. (5) it can be noticed that the percentage of loss in weight was comparatively low after the first week in storage, then it gradually increased every week till it reached its maximum after 28 weeks storage. The rate of increase was distinguishly higher in the semi-ripe fruits. This may be due to the progressive rate of ripening and the more juicy flesh of the semi-ripe fruits as compared with the mature fruits. The same trend was noticed in the percentage of decayed fruits during the whole period of storage, and may be due to the same reasons. On the contrary, the fruit firmness was higher in mature fruits than the semi-ripe fruits during the whole storage period. As the storage period extends, the fruit gradually looses its firmness. This is going paralel with the progress of the fruit ripening process.

In addition, similar results were noticed in the second season, 1985 (Table 7 and Fig. 6).

2- Effcet of the picking stage on the chemical properties during storage of Meet-Ghamr peach fruits under 0 °C:

Eables (8,9) and Fig. (7,8) show that total acidity showed an increasing tendancy at the first two weeks in storage, then it gradually decreased during the following periods. It was noticed that the total acidity value was comparatively higher in mature fruits than in semi-ripe fruits. In addition, the T.S.S. value and the T.S.S./acid ratio was gradually increasing during the whole storage period. The increase was comparatively higher in semi-ripe fruits than in mature fruits. This may be due to the increasing rate of ripening in the semi-ripe fruits as compared with the mature fruits.

It can be concluded from the previous results that the mature fruits were more suitable for storage under 0 °C, as they showed higher keeping quality than the fruits picked at the semi-ripe stage.

The previous results are in agreement with many investigators [Claypool et. al. (1969), Adrian et.al. (1969), Bazzocchi et. al.(1975), Gerdts and LaRue (1976), Mitchel et.al. (1977), and Sommer (1982)].

Sommer (1982) recommended harvesting of stone fruits before they were completely ripe in order to secure

sufficient time for long distance transportation and marketing. He stated that such fruits had a higher resistance to certain diseases than fruits harvested later. Furthermore, pre-climacteric fruits were firmer and less subject to mechanical injury from handling than fruits harvested after the onset of ripening in Meeat-Ghamr fruits under these investigation.

However, the trend of colour is in general agreement with the findings of Barakat (1970) on Meet-Ghamr peaches.

IV-Determining the suitable cold storage temperature for Meet-Ghamr fruits:

1-Effect of cold storage temperatures on the physical properties of Meet-Ghamr fruits.

It is abvious from Tables (10,11) and Fig. (9,10) that the loss in weight was slight after one week storage, then the rate of loss gradually increased during the following periods, in both successive seasons. In addition, the rate of loss was comparatively higher under 0 °C cold storage as compared with the 5 °C during the whole storage period. As for the percentage of decay, no sign of decay was noticed under the two storage degrees after one week, but at the following periods an increasing percent occured, showing

about the double under 0°C as compared with 5°C. On the other hand, the fruits showed slight higher frimness value under 0°C than fruits stored under 5°C. This may be due to the stimulating effect of 5°C on the fruit ripening as compared with 0°C. In addition, the organoleptic tests, colour and appearance of fruits were more better in the fruits stored under 5°C than those under 0°C.

2-Effect of cold storage temperature on the chemical properties of Meet-Ghamr fruits.

It can be revealed from Tables (12,13) and Fig. (11,12) that the total acidity show a slight increase in their values during the first two weeks of storage, then it gradually decreased till the end of the storage period. The total acidity values were comparatively higher in fruits stored at 0°C as compared with those under 5°C. On the other hand, the T.S.S. values and T.S.S./acid ratio showed a gradual increase during the whole storage period, with a comparative higher ratio under 5°C than under 0°C.

From the previous results of the fruit physical and chemical properties, it can be concluded that the mature fruits of Meet-Ghamr variety showed higher keeping quality when stored under 5°C as compared with those stored under 0°C.

This fact is in agreement with Echert and Sommer (1967) who indicated that it was generally desirable to store fruits and vegetables at the lowest temperature that does not harm the tissues.

However, Matsumoto and Sommer (1967) reported that sporangiospores of Rhizopus stolonifer were inactivated by temperatures of 2-5 °C or below, providing germination had started. In addition, Mitchell et. al. (1977) found that the 41 °F storage temperature caused softening to proceed at a rate many fold higher than the 32 °F storage temperature. This result may differ with our results, but the Egyptian enviromental conditions and the local variety which we have used may give the reason for this difference.

However, our results are in general agreement with the findings of Piesson (1966), Bussel et. al. (1970), Gerdts and LaRue (1976), Mitchell et. al. (1977(and Foad (1984).

V. Effect of some prestorage treatments on the keeping quality of Meet-Ghamr fruits:

1- Effect of some prestorage treatments on percentage of loss in weight in Meet-Ghamr peach fruits during cold storage at 5oC.

It is clear from Table (14, 15) anf Figure (13) that

the percentage of loss in weight gradually increased in Meet-Ghamr peach fruits during the whole storage period in all treated and untreated fruits. The rate of increase was comparatively higher in untreated fruits. On the other hand, the Botran and hot water treated fruits significantly showed the lower percent of loss in weight as compared with all other treatments and the control, especially Botran treatments at 1000 ppm. These results are nearlt similar in both seasons. The results are in general agreement with the findings of fouad (1984) on apples.

2- Effect of some prestorage treatments on percentage of decay in Meet-Ghamr peach fruits during cold storage at 5^{o} C.

Table (16, 17) and Figure (14) reveals that a gradual increase in percentage of decay occured during the whole storage period. The percentage was significantly lower and slower in hot water and Botran treated fruits at both concentrations followed by Rovral and Bravo treatments. This trend was obvious in both two seasons. In addition, there was no sign of decay after a week of storage under 5^{o} C in most of treatments, especially at the second season. After 28 days of storage, the percent of decay was about 14-20% in hot water and Botran treated fruits at both concentrations

and seasons. The percentage was comparatively higher in some treatments and control fruits in both seasons. On the other hand, the untreated fruits significantly showed the higher percent of decay, followed by the Bravo treatment at both concentrations. This trend is nearly similar in both seasons.

From these results, it can be concluded that the most effective treatments were the Botran at 1000 ppm for 5 minutes, followed by the hot water at 50 °C for 5 minutes, then Botran at 2000 ppm for 5 minutes, followed by Rovral at both concentrations. On the other hand, Bravo disinfectant did not show any considerable effect at any concentration.

These results are in agreement with many investigators [Luespschen (1964), Gilpatrick (1973), Wells (1971), Wells and Marvin, (1971), Dar and Mukhopadhyay, (1976), Phillips and Harris (1979), Wells and Bennett (1976), Smith and Bassett (1964), and Smith and Peny (1972)].

Agawa et. al. (1963) showed that control of R. Stolofiner was achieved by dipping peaches in a suspension containing 750 ppm Botran. On the other hand, Smith and redit (1962) reported that hot water treatments were effective against brown rot and Rhizopus rot of western-grown cultivars of peaches and nectarins. The most recommended treatment was found to be 2-3 minutes at 51.5 °C.

Dewey and Maclean (1962) showed that Botran at 2000 ppm gave considerably better control of brown rot than the 1000 ppm. Wells and Harvey (19700 reported that combined hot water and Botran treatments of peaches, plums and nectarines were more effetive in the control of postharvest decays than either hot water or Botran alone. I think this point is essential to be carried out in the future followed work in the Ph.D. The other new point to be considered in the future work is the mixing of Botran with other fungicides (Chandler, 1968).

In addition, Lacroix et. al.(1974) described Roval as a contact fungicide effective against Botrytis cinerea and Rhizoctonia solani, Stanchina et. al. (1977) also found that Roval reduced the incidence of rots in apples.

3- Effect of some prestorage treatments on rind colour in Meet-Ghamr peach fruits at 5 °C.

It can be noticed from Table (18, 19) that the rind colour gradually increased during the different storage periods in all treatments and control. This increase was comparatively higher in hot water treatment during the two comparative seasons. This may be due to the enhancement of hot water to the ripening processes. This increase was followed by Botran treatments under both concentrations,

while the lower rate of increase was in untreated fruits. This means that the hot water and Botran treatments showed a little stimulating effect on rind colour

4- Effect of some prestorage treatments on the firmness of Meet-Ghamr peach fruits during cold storage at 5 °C.

It is abvious from Tables (20, 21) and Figure (15) that all treated and untreated fruits showed a continuous slow rate of decrease in flesh firmness under the cold storage period in both two seasons. The rate of decrease was significantly slower in the hot water and Botran treated fruits, especially the Botran at the lower percent 1000 ppm which showed the highest firmness rate between all treatments in both seasons. On the other hand, the Bravo treated fruits, especially at the higher concentration 2000 ppm, and the control significantly showed the lowest firmness percent.

These results are in general agreement with the findings of Foad (1984) on apples. The firmness trend is also in general agreement with the findings of Barakat (1970) on Meet-Ghamr peaches.

5- Effect of some prestorege treatments on total soluble solidsin Meet-Ghamr peach fruits during cold storage at 5 C.

It is obvious from Tables (22, 23) and Figure (16) that the total soluble solids in Meet-Ghamr peach juice gradually increased in all treated and untreated fruits during the whole storage periods in both seasons. In addition, the percentage of total soluble solids was significantly higher in fruits treated with hot water and Botran (both concentrations). This may be due to the stimulating effect of these treatments on the ripening rate in the treated fruits. On the other hand, the lower rates were found in the Bravo treated fruits and the control.

However, the trend of T.S.S. was in general agreement with the findings of Barakat (1970) on Meet-Ghamr peaches and Foad (1984) on apples.

6- Effect of some prestorage treatments on percentage of juice titratable acidity in Meet-Ghamr peach fruits during cold storage at 5 C.

Tables (24, 25) and Fig. (17) reveal that the titratable acidity in Meet-Ghamr juice showed a gradual steady decrease in all treatments during the storage period

in both seasons. On the other hand, the percentage of titratable acidity was significantly lower in hot water and Botran treated fruits (1000 ppm) as compared with other treatments. This may be due to a stimulating effect of these treatments on the physiological processes leading to ripening. However, the trend of total acidity was in general agreement with the findings of Barakat (1970) on Meet-Ghamr peaches and Foad (1984) on apples.

7- Effect of some prestorage treatments on T.S.s / acid ratio of Meet-Ghamr peach fruits during cold storage at 5 °C.

From Tables (26, 27) and Figure (18) it can be concluded that the T.S.S./acid ratio showed a gradual increase during storage in both seasons. In addition, the hot water and Botran treated fruits generally showed higher figures as compared with other treatments and control, while Bravo treatedfruits and control showed the lower figures in both two seasons.

generally, the T.S.S./acid ratio trend was similar to the findings of Barakat (1970) on Meet-Ghamr peach fruits and Foad (1984) on apples.

8- Effect of some prestorage treatments on total sugar in Meet-Ghamr peach fruits during cold storage at 5 °C.

It is evident from Tables (28, 29) and Fig. (19) that the total sugars in Meet-Ghamr peach fruits gradually increased during the storage period in all treatments. This trend was obvious in both seasons. In addition, the percent of total sugars was comparatively higher in hot water and Botran treated fruits (of both concentrations) during the hole storage period. This result coincide with the results obtained on titratable acidity and total soluble solids, and may be due to the stimulating effect of these treatments on the rate of ripening.

As for the effect of hot water and Botran treatments, the results coincide with the findings of many investigators [Smith et. al. (1974), Smith and Redit (1962), Smith and Bassett (1964), Smith and Peny (1972), Harding and Savage (1964), Well (1971), Wells and Harvey (1970), Sommer and Mitchell (1968), and Dewy and Maclean (1962)]