

ABSTRACT

Four trials were carried out to investigate the behaviour of Julie mangoes under different storage conditions in an attempt to extend the shelf-life. For all trials the fruits were harvested at the mature, green stage, individually washed with tap water, dipped for three to five minutes in a fungicidal solution of Benomyl (0.1%) at 51°C - 53°C, then randomly selected, wrapped with tissue paper and stored. The relative humidity in the storage chambers was maintained above 85%.

The storage conditions were as follows:

Trial 1 - ambient conditions (28°C), 16°C and 10°C

Trial 2 and 4 - 28°C, 14°C, 10°C and 6°C

Trial 3 - 5% O₂:5% CO₂, 5% O₂:8% CO₂, 5% O₂:10% CO₂,
5% O₂:12% CO₂, 2% O₂:5% CO₂, 8% O₂:5% CO₂,
10% O₂:5% CO₂, 21% O₂:0.03% CO₂, all at a
temperature of 10°C and 21% O₂:0.03% CO₂ at 28°C.

Sampling and fruit quality analysis were done on the day of harvest and for fruits stored at 28°C as they ripened, for all the Trials. For Trails 1 and 2 a seven day sampling period was used and for Trial 3 (controlled atmosphere storage) fruits were analysed every ten days. At each sampling interval four fruits were removed from the storage, two were immediately analysed and two were left under ambient conditions to ripen and were then analysed. The parameters evaluated were weight and volume changes, specific gravity, texture, starch content, total soluble solids, acidity, pH, moisture content, skin and flesh colour, shrivelling, odour, decay and taste.

A simulated shipping/storage trial was carried out in Trial 4 in addition to a consumer reaction test. Fruits after being pre-treated and wrapped with tissue paper were paced in boxes containing shredded paper and then stored at the four temperatures. Fruits were evaluated in the consumer reaction test after being stored for 7 days under ambient conditions and 21 days at 14°C. Fruits at 10 and 6°C were stored for 21 days, ripened under ambient conditions and then evaluated.

Fruits stored under ambient conditions showed a maximum shelf-life of ten days, although many fruits ripened in three days. As the storage temperature was lowered, shelf-life was increased. Fruits ripened in storage after 14 days at 16°C and 21 days at 14°C. Fruits at 10°C and 6°C did not ripen in storage even after 42 days but this increase in shelf-life was at the expense of the quality. Fruits were of acceptable quality when stored for 21 days at these temperatures but those at 10°C were more preferred by the consumer, based on skin appearance, flesh colour and firmness.

Under controlled atmospheres (C.A.) storage, a maximum shelf-life of thirty days seems possible. Fruits at lower oxygen and higher carbon dioxide levels experienced less weight and volume losses. The fruits stored under C.A. conditions seemed firmer than those stored under ambient conditions but despite this and the added benefit of 30 days extended shelf-life, the organoleptic characteristics of the mangoes were not acceptable.