

Post-Harvest Management Protocols

GRAPES

Grape belonging to Family Vitaceae is a commercially important fruit crop of India. It is a temperate crop which has got adapted to tropical climatic conditions of peninsular India. Approximately threemillion tonnes of grapes are harvested annually in India. Grapes are harvested mainly during January to March (in Maharashtra and Karnataka states) however, in sub-tropical conditions of northers plains the grapes are harvested during June. If not all the varieties, one or more varieties are always available at any given time of the year.

Total grapes production for the year 2019-20 was 2939 ('000 MT). Top producing states are Maharashtra, Karnataka, Tamil Nadu, Mizoram and Andhra Pradesh.



Varieties of Grapes in India are:

- Thompson Seedless
- Bangalore Blue
- Sharad Seedless
- Sarita Seedless
- Red Globe
- Crimson Seedless
- Nanasaheb Purple Seedless
- Perlette
- Gulabi
- Sonaka
- Super Sonaka
- Manik Chaman
- Fantasy Seedless

MATURITY INDICES OF GRAPES

Grapes fruit should be harvested only when the fruits berries are fully matured. In grapes sugar content is considered as the indicator of level of ripening however, TSS acidity ratio is an important aspect as it affects the taste of grapes. physical characteristics are also considered for harvesting. Major appearance criteria are is uniform color of the bunch berries and size of individual berry.

Harvesting

Only attractive bunches fulfilling minimum quality requirement should be harvested. Harvesting should be done by skilled workers wearing soft rubber gloves and using sharp secateurs / scissors for cutting. The bunch should always be held the by the stem/ peduncle. Rough handling results in loss of bloom (thin wax coating on berry surface) making the berries susceptible to decay. Bunches should be harvested during the early morning hours before the berry temperature rises above 20°C. If rainfall has occurred just prior to harvest, the fruit should not be picked for at least 3-4 days, as the free moisture present on the surface of the berries can lead to fungal infections.

POST-HARVEST HANDLING

After harvesting, bunches should be placed carefully in the clean perforated crates lined with clean bubble sheets for cushioning.

PACKAGING

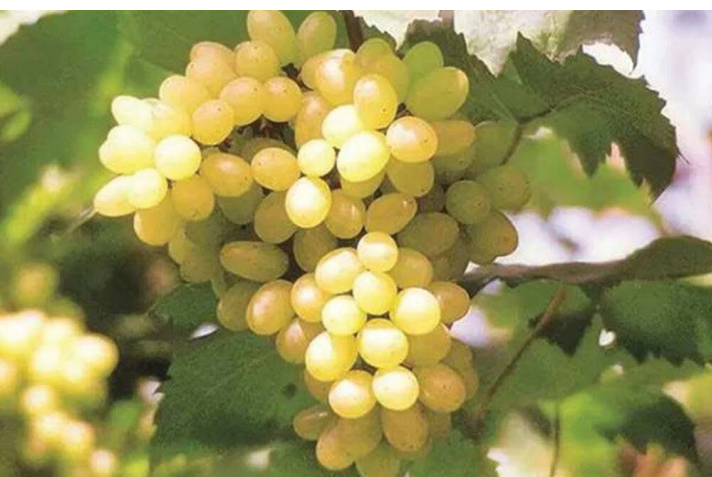
Grapes are generally packed in corrugated or solid fiber board cartons. A layer of bubble pad or protective liner is placed at the bottom of the carton to protect the grapes from bruising. Individual bunch is packed in punnet.

PRE-COOLING

Prompt removal of field heat from grapes is the best way of retaining their freshness for longer times. The temperature of harvested grapes should be brought down to less than 4°C within six to eight hours using forced Air in the pre-cooling chambers. After pre-cooling a Sulphur dioxide generating pad enclosed in absorbent tissue paper is placed over the grapes. This is then covered with the polyethylene lining and the box is closed¹.

PRE-COOLING

Banana fruits can be pre-cooled by using the forced air for 2-6 hours in Cold rooms to bring down the temperature.



STORAGE

Grapes along with Sulphur dioxide pads are stored in cold storage rooms where the temperature and humidity are maintained at 0±0.5 °C and 93±2%, respectively. Temperature of 0°C and humidity of 95% are the best for maintaining freshness and preventing decay².

Recommended Temperature
(degree Celcius)

-1-0



Recommended Relative
Humidity (%)

90-95



Shelf Life

3-6 Months



Product Loading Density (in Pound/cu.ft)	-
Initial Freezing Point (in degree celcius)	-2.1
Specific Heat Above Freezing Point in (kJ/Kg.K)	3.58
Specific Heat Below Freezing Point (in kJ/Kg.K)	1.86
Latent Heat of Fusion (in kJ/Kg)	274
Thermal properties of Banana	
Initial Freezing Point (in degree celcius)	-1.1
Specific Heat Above Freezing Point in (kJ/Kg.K)	3.65
Specific Heat Below Freezing Point (in kJ/Kg.K)	1.89
Latent Heat of Fusion (in kJ/Kg)	278

¹Technical standards for fruits & Vegetables, NHB

²Technical standards for fruits & Vegetables, NHB