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Storage of oranges with the use of the dry grass

S.M. SURYAPUJARY*, P.S. KAMBLE AND S.R.LENDE
Department of Botany, College of Agriculture, NAGPUR (M.S.) INDIA

ABSTRACT
Orange storage can be held up with the use of dry grass with 600 ppm bavistin. Bavistin in the sense of use as a reductor in the evapotranspiration and the respiration, which will prevent the loss during the storage and increases its shelf life. By this way we can store the oranges for near about 45 days. No matter after 45 days we will get the quality oranges and we can sale it on the good market value. Layers of dry grass and oranges are arranged in the room having temperature maintaining as room temperature and with this application of the bavistin. Reduction of the respiration and increase in the shelf life is the main theme of this practical.

Key words : Storage of oranges, Dry grass, Bavistin, Reductor.

INTRODUCTION

India produces number of varieties of orange i.e. citrus fruits, sweet oranges, santra, Mandarin, Lemon, Kinnow, Mosambi etc. Citrus fruits occupy 3rd position in the volume after the mango and banana. The production of fruits involved in India ranks 6th in the world production of oranges. In India orange occupies 1st position in the production of citrus fruits. World consumes mainly Satsuma and Clementine verities of oranges while India produces mandarins which are of different kinds that those consumed in the international markets. In 2001-2002 India exported 28,230 tonnes oranges valued at Rs. 31.23 cr to mainly Bangladesh, Nepal, Saudi Arabia, Srilanka, UK and USA.

As regards to the export of processed fruits our export of processed fruits and vegetables are increasing every year but the export of fruits in terms of volume shows ups and downs from year to year. Export of fruits shows instability, there by indicating the consistency in export of fruits to different countries. This is mainly because of fact that the oranges produced by the Indian farmers are not of good quality. The produce of farmers field is always good but due to the lack of the good storage facility the farmer cannot store that produce for more days till it exports. The available technology such as the cold storage and wax application is rather difficult for the farmers to handle or we can say that the Indian farmer cannot offer these technologies. Hence an attempt was made to find out the low cost technology for storing harvested oranges for period of minimum 2 months, which can be easily implemented by each farmer who is growing oranges and other citrus fruits.

MATERIALS AND METHODS

A small room of 8' x 6' size is sufficient for storing the oranges harvested from 100 to 200 plants.Minimum requirement in the room is to provide with one ventilator for air circulation. Floor should be washed completely and small quantity of water should sprinkle on the floor for making the floor cool. A layer of rice bran or wheat bran is spread uniformly on the floor of size generally of 5 to 6 cm thick. The first layer of oranges should be arranged linearly one after the another leaving the space of 1 to 2 cm between them Second row of oranges should be arranged in such a way that each orange is placed between the two oranges of first row. The third row is then arranged like the first row and fourth row is arranged as like as second row. In this way one layer is entirely arranged leaving a space of 5 cm from all four sides of wall.

A spray of 600-ppm bavistin is done on the layer of fruits arranged. Then spread of layer of 3 cm to 4 cm thick rice bran or wheat bran uniformly on the fruits. Second layer of oranges are arranged in a similar fashion as done for the first layer, which is again sprayed by the bavistin. By this system we can arrange up to 8 to 10 layers.

Top most layers should be covered with the moistened rice bran or wheat bran, which will sustain the moisture in the layers and maintained the humidity, which will also reduce the respiration from the fruits. The coolness in the room is maintained by the cooler run at very low speed, after closing the room. If the facility of air cooler is not available with the farmer then he can use the cooling pads also but it is necessary to moisten frequently. By this method oranges can produce for maximum of 45 days, which is sufficient time needed for searching the market.

RESULTS AND DISCUSSION

The oranges stored by this method described above

* Author for correspondence.

Table 1 : Observations taken after the 40 days of the storage

Characters	Normal storage	Storage by using rice bran
Skin	Loose and rough type	Smooth and tight skin
Segments	Pola type condition observed after some days	With thin covering and attached to the rind
Juice content	25 to 30 ml/ fruit	32 to 34 ml/fruit
Fruit color	Dull and lost shine	Maintain the shining and looks like fresh even after the 45 days of storage
Acidity content	7 to 8.3 %	11 to 13 %
Fruit weight	130 to 135 gm	145 to 160 gm
Fruit appearance	Looks dull	Looks fresh
Diameter of fruit	4 to 5 cm.	5.8 to 6.1 cm.
Rind appearance	Observed like spongy	Not spongy
Vesicles	Lesser juicy	Contain more juice
T.S.S. of fruit	7 to 8	10 to 11
Taste	Sour	Sweet

for 45 days and then used for the marketing. The change in the temperature is shown in the Table 2. It is observed from the Table 2 that as the temperature outside the storage room is increasing from 35^0C to 48^0C temperature inside the storage room is decreasing from 27 to 30 ^{0}C. Some of the observations taken in the fruits after 30 days of storage are presented in the Table 1.

From this we can say with the purpose of fruit after 45 days of storage remains fresh and can be used for marketing. According to international standards of the export of oranges the acidity content must be up to 13 to 14 % and juice content of fruit should be 40 % of the total weight i.e. it is the ratio of weight of fruit and total juice content.

From the Table 2 it is indicating that as the temperature is increasing outside then also the temperature inside the storage room is as room temperature this is because of the air cooler and water inside the bran, which will maintain the temperature inside the room and prevent the fruit from the more respirations.

Table 2 : Showing the temperature difference between outside and inside storage room

S.N.	Temperature outside room (^{o}C)	Temperature inside room (^{o}C)
1.	35	30-31
2.	40	29-30
3.	45	28-29
4.	48	27-28

From the Table 1 it shows that the fruits after the 45 days of storage it shows improvement in the weight of fruit appearance, T.S.S. of fruit, acidity of fruit and all other characters that are shown in the table. Moreover the cost involved in this method is very less than other methods and this method is quite good than other methods as materials used are available at very low cost and easily available on the farm.

Cost benefit ratio

The cost involved in this normal storage is nil. In this just the farmer has to store the fruits in the room and take out at the time of marketing. But the storage by use of rice bran or wheat bran with bavistin spray is having some amount expenditure but at very low cost. The main cost involved in this is electricity cost and farmer has to purchase the bavistin. Other things are easily available on the farm.

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