

Prevalent Practices on Fruits and Vegetable Crops Preservation in and around Coimbatore District Agricultural Mechanization and Postharvest Technology

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Abstract—

*“Uzhuthundu Vazhvarey Vazhvaar,
Matrellam thozhundundu pin selbavar”
Whoever ploughs lives (leads) others worship and
follow them—Tirukkural*

India is the Second largest producer of fruits in the world. In spite of that per capita availability of fruits and vegetables is quite low because of post harvest losses which account for about 25% to 30% of production. In spite of being major producer of fruits and vegetables, nearly worth of 13,300 core every year being wasted in India. Due to lack of adequate cold storage facility and well covered refrigerated transport, very high amount of wastage in fruits and vegetables can be imagined. The preservation of fruits and vegetables are more dependent upon cold storage, logistics and Distribution channel. This study identifies the sources of wastages, best low cost preservation method. This study will also help to minimize the cost of fruits and vegetables so that consumer too gets benefitted. This research is confined to Coimbatore District Tamilnadu. This study focuses on the various practices adopted by the farmers in and around Coimbatore (Pollachi, Thondamuthur, Annur, Sulthanpet, Sular, Coimbatore north, Coimbatore urban, karamadai, kinathukadavu) in the villages towards preservation of food without refrigeration methods.

Keywords: Agriculture, Fruits and Vegetables, cold storage, wastages.

1. INTRODUCTION

The total production of fruits and vegetables in the whole world is around 370 Metric tons. India ranks first in the world with an annual output of 32 MT fruits, about 8% of the world's fruit production; also is the second largest producer of vegetables (ranks next to China) and accounts for about 15% of the world's production of vegetables. The current production level is over 71 million MT[2] There are over 4000 fruit processing units in India with an aggregate capacity of more than 12 lakh MT (less than 4 percentage of total fruits

produced). It is estimated that around 20% of the production of processed fruits is meant for exports, the rest caters to the defense, institutional sectors and household consumption. The fruits and vegetables considered important by the Horticulture Board of India are mostly grown in the areas of Jammu & Kashmir, Himachal Pradesh, hilly regions of North Uttar Pradesh, Tamil Nadu, Maharashtra, Karnataka, Gujarat, Andhra Pradesh, Assam, Madhya Pradesh, Rajasthan, Punjab, Tripura, West Bengal and Orissa.

The Coimbatore District in the state of Tamil Nadu is well enriched in production of variety of food crops including Fruits and vegetables. It is situated in the western Agro Climatic Zone of our country. Minimum temperature prevailing is 18 degree centigrade and maximum temperature is 35 degree centigrade highly suitable for cultivation of food crops. It is the Third largest producer of 19.985 (48.19) an estimated of 48% total land area's space is covered for growing fruits and vegetables in Coimbatore district. In terms of productivity, fruits and vegetables occupy 2nd rank in Tamilnadu. Due to diverse agro climatic conditions and better availability of package of practices, the production is gradually rising. Although, there is a vast scope for increasing the production, the lack of cold storage and cold chain facilities are becoming major bottlenecks in tapping the potential. The cold storage facilities now available are mostly for a single commodity like potato, orange, apple, grapes, pomegranates, flowers, etc. which results in poor capacity utilization.

2. SIGNIFICANCE OF THE STUDY

With a high value of wastage of fruits and vegetables result a huge loss could be imagined. Earlier there was a problem of credit for farmers now it is not a problem for some extent. Food security is a major issue in Tamil Nadu with prices running at an all time high. Climate change affects the region

resulting in drought, poor soils, and water depletion. Farmers need advice, support and information on the latest technological advances to help them cultivate the best crops from the land and to raise their wealth.

In India, Agriculture is playing very vital role in economic development and also back bone of the nation.

The scope of this study is enormous not only for farmers in Tamil Nadu but in identical geographical areas across the country.

3. OBJECTIVES

Objectives of the Study

The objective of the study is to identify and examine the existing Traditional methods followed by farmers in storing fruits and vegetables in Coimbatore District.

4. METHODOLOGY OF THE STUDY

The research is an exploratory study on the prevalent storage technologies followed by the farmers in the study area.

The Research tool used in this study is of “Focused Group Discussion” is a good way to gather farmer from similar backgrounds of experience on a specific topic.

The Focused Group Discussion had at April 2015 at Pollachi Coimbatore District. The farmers are from various places in and around Coimbatore and Udumalpet. The strength of Focused Group Discussion relies on allowing the participants to agree or disagree with each other. The famers are Major cultivators of fruits and vegetables. The Focused Group Discussion covered the methods of storing and preserving of 41 Varieties of Fruits and Vegetables.

5. METHODS OF STORAGE AND PRESERVATION

Invariably farmers in Tamil Nadu use the following methods in peak harvest period. Approximate tonnage per hectare and their seasons and present method of storing in practice are as follows.

Amaranthus

It's a leafy type, grown in well drained loamy soils with slightly acidic nature and warm climate this Coimbatore climate is more suitable for Amaranthus cultivation. Sowing can be done throughout the year. Within 25 days to 40 days the cultivation can be done. It's a year around vegetable. The approx yield per hectare can be around 10-15 tones. The traditional method of storing is of sprinkling water and keeping in open air.

Annual Moringa

Annual moringa comes up well in a wide range of soil. A deep sandy loam soil with a pH of 6.5–8 is ideal for cultivating this crop. The period for yield is of summer season. Planting is

done during July–October. (Monsoon season). 50 - 55 tones of pods/ha (220 pods/tree/year). The basic method followed is of bundling them in 20's and wrapping with green leaves.

Ash Gourd

A deep loamy soil with a warm tropical climate is ideal for higher yield. Planting is done during July and January. The cultivation period is of 140 days and the return will be of 20 tons per hectare. Major market in Coimbatore is Natchipalayam Market.

Bhendi

It is adaptable to a wide range of soils from sandy loam to clayey loam. Planting can be done during June - August and February. Normally it takes 100 days from sowing to cultivation. Harvesting can be done 45 days after planting. Fruits are harvested in tender stage at 1–2 days intervals. The approx yield is 12 to 15 tons per hectare. The traditional method of storing is by wrapping in poly woven air bag.

Beetroot

The **beetroot** is the taproot portion of the beet plant; generally, 55 to 65 days are needed from germination to harvest of the root. Beet can be grown in all agro-ecological regions in the country. Well drained soils are suitable -drained soil can cause growth problems. A pH range between 6.3 and 7.5 is most appropriate for cultivation. This product comes to market in bulk during March, April, May and August to December. The traditional method of storing is in open air.

Bitter gourd

Bitter gourd is popular due to its medicinal properties. Origin of the crop is unknown, but it is widely spread throughout the tropics. Bitter gourd peak production months during the months are January, February and the first two weeks of March and April, May June and July. Bitter gourd can be stored at ambient temperature for 4-6 days if they are harvested in a slightly immature stage. However this storage life can further be extended by storing them at 13 deg C. The maximum storage life at low temperature is limited to 14-16 days. The open air method is followed in Coimbatore district. The average yield is 15tons per hectare.

Bottle gourd

Sandy loamy soils rich in organic matter with good drainage and the pH ranges from 6.5 to 7.5 is suited for bottle gourd cultivation. This crop requires a moderate warm temperature. July and January are suitable for sowing. From crop establishment stage to cultivation stage normally it takes 115 days. The yield will be in 135th day, approximate quantity per hectare is of 15-20 tons.

Brinjal

Brinjal is one of the most commonly grown vegetable crops of the country. India produces about 7.676 Metric ton of brinjal with an average productivity of 16.3 metric ton per hectare. Brinjal requires a long warm growing season. Daily mean temperature in the range of 130 C to 210 C is favorable for its successful production. Special care is required to protect the crop from frost. A well-drained fertile soil is desirable for the brinjal crop. It is a hardy plant and may be grown on different soils. However, it grows best on soils with silt loam and clay loam texture. Sandy or sandy loam soil is preferred for the early crop. Brinjal is harvested when it attains good size and color. The surface of fruit should not lose its brightness and glossy color. A short piece of the stalk is left attached to the fruit. The average yield varies from 45 to 50 tons per hectare. The tradition method of storing is on open air.

Cauliflower

Cauliflower is one of the most important winter vegetables of India. India produces 4.694 Metric ton of Cauliflower per year. The average productivity is of 18 tons per hectare. When other conditions are favorable, cauliflower can be grown on any good soil, but a fairly deep loamy soil is most desirable. The yield of cauliflower varies from 20 to 40 tons per hectare in early season to about 50 tons per hectare during mid season. The tradition method followed is of displaying it in the open air.

Guava

Guava is known as the apple of the tropics. It is one of the most common fruits in India. It is grown all over the tropics and subtropics. The average productivity is of 11 tons per hectare the fruits harvested during winter season are superior in quality in comparison to rainy season fruits. Guava tree is hardy and can thrive on all soils ranging from alluvial to late rite. Guava is harvested twice in a year, first between August and September and again between the month of December and February. There is no proper storage method is followed in storing. Storing in poly bags will extend life.

Mango

Mango is one of the most important fruits of India. It is the choicest fruit and often known as the king of fruits. The average productivity is of 6.1 tons per hectare. Mango thrives well in tropical and sub-tropical climates. The ideal temperature for the crop ranges from 240 to 300 C along with high humidity. The cultivation is of April and may months. It takes 30 to 45 days for yield.

Butter Beans

Butter beans are a selection from a type collected from Vilpatti. The pods are 11.6 cm long; beans are 5 to 6 in

number per pod. The variety is suited for hilly regions of Coimbatore District from an altitude of 1200m to 2200m above MSL. The crop will be ready for first harvest from 100 days after sowing. The harvest will continue up to 140 days. It yields 3.47 tones of ripe pods per hectare in three to four pickings. Normally famers prefer open air storage method.

Chakravarthikeerai

It belongs to leafy vegetables; it can be grown throughout the year both in plains and hills. The average yield is approximately 17 tons per hectare. The crop duration is 145 days. The traditional method of storage is sprinkling the water for some days

Chilly

The chilly plant needs well drained loamy soils rich in organic matter with pH range 6.5-7.5. The sowing period is from January–February, June-July, October- November. Harvesting can be done 75 days after transplanting. The yield of green chilli is of 25 tons per hectare. It stored in open air.

Coccinia

It is a perennial plant with edible leaves and fruits; The plant is considered a medicinal plant in many countries by traditional medicinal practitioners and has reportedly diverse ethno medicinal uses. The yield is of 83 tons per hectare. The suitable season for the plant is summer. Open air storage system.

Coleus

It is a colonel selection from local type introduced from Tenkasi Tamil Nadu. It yields 32 tons per hectare. The crop duration of 180-190 days. The season for the plant is of summer. Open air storage system.

Colocasia

This type is an introduction selected from the germplasm maintained at Horticultural College and Research Institute, Coimbatore. It yields 24.3tons per hectare. Tubers have high starch content of 22.5% and higher protein content of 2.4%. Tubers have less acidity and good cooking quality. Summer season is suitable for this plant. Open air storage is being followed traditionally.

Cowpea

The first harvest for this plant is from 45 days to 50 days. 25tons per hectare is the yield. The suitable season for this plant will be in winter. Open air method is suitable for this vegetable.

Cucumber

It is a selection from a local types of Kanyakumari District more suitable vegetable for Coimbatore climate. It has more

water content, It yields 25 tons to 28 tons per hectare of ripe fruits with a good, attractive color. The fruits are long (60-65 cm), slightly curved, appearing towards stalk end, fairly big and each weighs 2.0 to 3.0 kg at ripe stage. It has got a good consumer appeal and market preference. The fruits can be picked at early stages (7-8 days after flowering) for use as tender fruits for salad, at well matured stage (16 days after flowering) for vegetable and at ripe stage (bright yellow with greenish yellow intermittent stripes) for dessert purposes along with sugar or jaggery. As a tender vegetable for salad it yields 15 tons per hectare in a crop duration of 100 days.

Dolichos Bean

It is a pure line selection (*Dolichos lablab* var. *typicus*) from a type collected under All India Co-ordinate Vegetable Improvement Project. It is earlier than other pandal varieties. The pods are ready for harvest in 80-85 days after sowing. The total crop duration is less 165 days It yields 18 tons of green pods per hectare. The pods are dark green, flat and slightly curved, tender and fleshy with better consumer's preference and market appeal.

French Beans

French beans is a pole type selected from germplasm population at Horticultural Research Station, Thadiyankudisai. Pods are less fibrous. The crop duration is 90 days. It yields 5.6 tones of green pods/ha. . Suitable for growing in the hill ranges of Tamil Nadu, viz., Shevroys, Palani hills and Nilgiris.

Garlic

It is a cloned selection from the germplasm assembled at Horticultural Research Station, Ooty. It has a potential yield of 17.1 tons per hectare under Ooty conditions. The crop duration is 120-130 days. The bulb is big and dull white in color and weighs 30 to 40 gm each. Each bulb contains 20 to 25 cloves. The cloves have a flattening surface inside. It is moderately resistant to blast and resistant to thrips and tip drying caused by foliage nematode.

Greater Yam

Greater Yam is a clone selection from the germ plasm introduction maintained at the Department of Olericulture, Horticultural College and Research Institute, Coimbatore. It yields 44.8 tons of tubers per hectare in a crop a duration of 8 to 8.5 months.

Moringa beans

It is a pure line selection from local type collected from Pallangi village of Kodaikanal taluk. The crop duration is 140-160 days. It yields 7tons per hectare. It is suitable for South Indian hills from an altitude of 1200m above MSL. The green pods are fleshy and thick skinned. Seeds are also used for cooking which are rich in protein, minerals and vitamins. They are white in color. The suitable season for the plant is of winter/Summer.

Onion

Bellary onion, Red, Pusa Red, NP 53, Arka Niketan, Arka Kalyan, Arka Lalima, Arka Kirthiman, Arka Pitamber, Arka Kalyan, Agri Found Light Red Agri Found Dark Red and Rose onion (small) are commonly cultivated in and around Coimbatore district. May and june is the best season for planting. The crop yields 15 to 18 tons per hectare. The period is of 140 days to 150 days. The major market is Coimbatore. Open air storing method is followed as a traditional culture.

Potato

Potato is a major vegetable widely consumed throughout Tamilnadu whereas it is grown only in the hilly areas of Dindigul, The Nilgiris, Krishnagiri and Erode districts and some part of Coimbatore district. The yield is of 12 tons per hectare and normally it takes 100–110 days for cultivation. The method traditionally followed is of open air system.

Banana

Banana is the fruit of a plant of the genus *Musa* (family Musaceae), which is cultivated primarily for food and secondarily for the production of fibre used in the textile industry are also cultivated for ornamental purposes. Almost all the modern edible parthenocarpic bananas come from the two wild species—*Musa acuminata* *Musa balbisiana*. The bunches will be ready for harvest after 12 to 15 months of planting.

Harvest

Bunches attain maturity from 100 to 150 days after flowering depending on variety, soil, weather condition and elevation.

Lemon

Lime or Acid lime (*Citrus aurantifolia* *swing*). Is more popular in India lemon (*Citrus limon*). Acid lime is cultivated largely in Andhra Pradesh, Maharashtra, Tamil Nadu, Gujarat, Rajasthan, Bihar and to a limited extent in other states. Climate: Areas with dry climate and low rainfall are best suited for growing limes. Lemons can be grown in heavy rainfall humid regions. Soil: Lime and Lemon may be planted in medium black, loamy or alluvial soils having perfect drainage and devoid of calcium carbonate layer.

Harvesting and yield

Maturity of citrus fruits depends upon the climatic conditions, nutrition, heat units and moisture availability. The period of maturity is shorter in acid lime (5-6 months) and longest in mandarin and sweet orange. The lime and lemon fruits are harvested when they just start changing. They are harvested in installments as they ripen. Major harvesting period in July-September and November-January. Post harvest handling and Marketing: Harvested fruits are graded according to size and colour and packed in bamboo baskets or wooden crates lined

with neem foliage. Sometimes fruits are packed in gunny bags and transported by rail or road to distant markets.

Grapes

Grape (*Vitis sp.*) belonging to Family Vitaceae is a commercially important fruit crop of India. It is a temperate crop which has got adapted to sub-tropical climate of peninsular India. Grape is an important commercial fruit crop of south India. Grape growing has been regarded as most remunerative enterprise. In North India particularly, Punjab its cultivation is being taken in a big way. Due to heavy initial investment on erecting the system of training and occurrence of rains at the ripening time of grapes, the area under grapes may not increase further. In Coimbatore area through staggered pruning fruit is taken throughout the year.

Apart from Theni and Cumbum, Coimbatore has a large number of farms growing the paneer variety of grapes (with seeds). Almost 70 per cent of the produce goes to Kerala and the rest is sold in the local market.

6. RESULTS AND DISCUSSION

This study identified the practices adopted by farmers for preservation of fruits and vegetables in and around Coimbatore. It highlighted major problems faced by farmers in extending the shelf life, of water contended fruits like water melon and leafy green vegetables.

The need for cold storage and suitable warehousing facility is the need of the hour of State Government may be urged to year mark certain reasonable portion of development expenditure towards infrastructure facilities for sustainable preservation of vegetables and fruits through constructing adequate and acceptable cold storage & warehousing facilities. It is hoped by this author of the paper that the problems of farmers are well understood by the policy makers address issues in right manner and provide much need sucker and relief by way of adequate cold storage and ware house facility.

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