

## **Post Harvest Practices and Loss Assessment of Some Commercial Horticultural Crops of Assam**

The North – Eastern Region of India is considered suitable for growing a large number of tropical, subtropical and temperate fruits and vegetables. In Assam, fruits like banana, citrus, pineapple, papaya, jack fruits; vegetables like tomato, brinjal, cole crops, cucurbits and spices like ginger and turmeric are cultivated in commercial scale besides growing some minor fruits and vegetables indigenous to his region. Horticultural crops cover in area of 5.43 lakh hectares, which accounts for 15.97 percent of the total cultivable area of 34.00 lakh hectares in the state. Despite having all the favourable factors, the desired level of development in horticulture has not been achieved because of a number of constraints. However the Productivity of many fruits and vegetables is far below the national averages. Moreover, due to absence of proper post harvest management system a bulk quantity of our produce gets damaged during the process of handling, transportation and marketing; resulting in 10-25 per cent annual losses.

Due to absence of proper storage and marketing facilities, farmers are forced to sell their produces at throwaway prices. Sometimes farmers do not even get the two way transportation cost, so they would rather dump their produce near the market area than bearing the transportation cost required for taking the produce back.

A survey was conducted to know the post harvest practices prevailing in the farmers field and to assess the losses of some commercial horticultural crops of Assam in order to identify the technological gaps in the existing post harvest practices. Data were collected on post harvest practices and losses of some horticultural crops in different stages of handling through pre-tested schedule, interview and spot assessment. District covered in this phase were Nagaon, Morigaon, Kamrup, Goalpara, Dibrugarh and Tinsukia.

### **Post harvest practices followed in different crops:**

#### **Oranges**

Orange orchards are generally located on the foothills of Assam bordering Arunachal Pradesh, Nagaland and Bhutan along few other places. These orchards were established many decades earlier, some of were 50 to 100 years old.

New orchards are rare in sight. Nevertheless one can increase production to a considerable extent from the existing orchards just by adopting few scientific rejuvenation practices. Harvesting generally starts by last week of October or first week of November and continues till the first fortnight of January. The age old practice of hand plucking is in practice for harvesting and is done by hired skilled laboures. A special type of indigenously developed bamboo ladder is used for the purpose. Fruits are plucked from trees and in bamboo basket, that are hanged on the tree, then carried on head to the site of collection and fruits are thrown to the ground from a height of about one meter.

Transportation to the market is done by truck, on which fruits are placed in between paddy straw. For loading, fruits are carried in basket on head and thrown over straw/or fruits already present inside the truck from a meter height. These practices result in brushing of the fruits and as a result the fruits becomes unmarketable.

Fruits have to face the same fate of rough handling during unloading. Storage is a very neglected aspect in the whole process and there is no permanent structure (cold storage or cold chain etc.) for storage in any point of time during the whole process of harvesting to marketing.

### **Pineapple**

Karbi Anglong, NC Hills and Cachar are the major pineapple growing districts of the state. Kew and Queen are the most popular varieties among the growers. Post harvest loss was found to be more in middleman level than the farmer's level. The major mode of transportation is bicycle and truck for local and distance market, respectively. Grading is mainly done on the basis of size. The middlemen store the fruits in gunny bags, bamboo basket and open floor. The total post harvest loss is about 9.25 per cent, out of which 4.22 is at grower's level and 5.03 per cent is at middlemen's level.

### **Banana**

Nagaon, Barpeta, Kamrup and Goalpara are the major banana producing districts of Assam. Chenichampa, Malbhog and Jahaji are the most preferred varieties of the state. During peak season (June-Oct) everyday eight to ten truckload of banana, each truck carrying about 1100-1200 bunches, are sent to West Bengal, Bihar, UP, Orrisa and Nepal from a place called 'Darangiri' in Goalpara district. Bananas are stored in a temporary shed until they are loaded in trucks for distant markets. Bananas are transported without introducing any packaging system. The bunches are simply dumped in a truck and tied with a turpaulin cover. About 10 per cent loss is recorded during transportation. The total estimated loss during post harvest handling is about 22 per cent.

### **Tomato**

After harvesting, the farmers bring their produce to the market for sale. Their mode of transport from field to the market is preferably by bullock/buffalo cart, which is the cheapest among the available transport. Packaging is almost absent in the farmers' field. However, few farmers use paddy straw as cushioning material in the cart to carry the tomatoes to market. In the market, the middlemen use to pack the tomatoes in paper cartoon of 20 kg capacity (approx) having no ventilation and send them to distant market. Once the consignment reach the market, damaged and decayed fruits are sorted out either at wholesaler or retailer level and these are sold at throwaway prices if there are any takers. In

the whole process right from farmers field to the consumer the percentage of loss goes up to 25.25 per cent.

### **Cauliflower**

The climate and soil of Assam are very suitable for the cultivation of cauliflower. Lack of proper storage facilities resulted in market glut during peak growing season. These results force- selling by the farmers in throwaway prices. There have been considerable losses during transportation (7.5%). The general practices followed for packaging is very simple, though not scientific and dependable. For distance market, cauliflowers are placed inside a bamboo basket. In between two layers of cauliflowers newspapers are used. After filling up, the baskets are covered with banana leaves. The capacity of the bamboo is around 90-100 kg. For local market the widely used transportation mode is the handcraft.

### **Spine gourd and Pointed gourd**

The handcraft is the common mode of transport from farmers field to local market or wholesale market. Each cart can take a load of 4-5 q. For transportation to distant markets either trucks or buses are used. Bamboo basket is the convenient mode of packaging for distant markets. For packaging, a lining with fresh banana leaf is given in the inner surface as well as on the top of the basket and sealed with a net made up of bamboo. Cost incurred during packaging and transportation for each 100 kg weight basket comes around to Rs. 64.00-94.00.

Post harvest losses of these two crops are mainly either due to weight loss or because of ripening during transportation and marketing. Total loss in different stages is reported to be 17.1 and 16.9 per cent in spine gourd and pointed gourd, respectively.

### **Ginger**

Ginger is commercially grown in Tinsukia, Karbi Anglong and NC Hills districts of Assam. In the last decade, ginger production has reached ever- highest peak in Assam and maximum credit goes to the farmer belonging to the above districts. In recent time ginger has been exported to Bangladesh, Spain, France and other European countries and the farmers are getting remunerative prices.

Ginger is harvested manually with the help of hand hoe. After harvesting the crop is directly packed in gunny bags of 60-70 kg capacity in the field itself. The bags are then directly taken to wholesale market, which are then sent to the distant markets by truck. Losses during and after harvesting are remarkable, which goes up to 10.5 per cent. At harvesting, the loss is mainly due to chopping by spade; later on weight loss is the main reason.

## Post Harvest Loss Assessment

The post harvest losses varied from crop to crop and within different stages (Table 1). Among the crops, the highest total loss was recorded in tomato (25.25 %) followed by Banana (22.00%). The highest post harvest losses were recorded during transportation in tomato and banana. Maximum loss during marketing was recorded in banana (12.00%) followed by tomato (9.75 %).

**Table 1: Post Harvest losses (%) of Horticultural Crops at various Stages of Handling**

Crops	Harvesting	Grading	Transportation	Marketing/ Storage Wholesaler	Retailer	Total loss(%)
Orange	3.25	0.75	1.25	1.20	7.50	13.95
Pineapple	1.73	0.54	1.95	2.66	2.37	9.25
Banana	Nil	Nil	10.00	5.00	7.00	22.00
Ginger	1.5	2.25	1.50	2.75	2.50	10.50
Tomato	0.75	3.75	11.00	2.50	7.25	10.50
Cauliflower	Nil	2.75	7.50	1.75	3.75	15.75
Spine Gourd	Nil	8.30	4.30	1.80	2.70	17.10
Pointed Gourd	Nil	5.40	7.50	1.90	2.10	16.90

Banana recorded the highest monetary loss of Rs. 128.34 crores per year due to losses during handling and marketing as against the lowest monetary loss of Rs. 4.33 crores in oranges (Table2). This has reflected the drainage of hard earn revenues due to non adoption of appropriate post harvest management practices and lack of storage facilities in the state.

**Table 2: Post harvest monetary loss of some horticultural crops in Assam.**

**2001 – 2002**

Crops	Production (‘ 000t)	Monetary loss (Crores/ Year)
Banana	583.38	128.34
Orange	62.07	4.33
Pineapple	209.00	19.33
Ginger	111.08	11.66
Tomato	332.00	41.99
Cauliflower	232.80	11.03

Post harvest technology is an integral part of agriculture production and utilization system and it plays a key role in loss reduction, value addition, food security, employment and income generation. Therefore, there is an urgent need for post harvest technology revolution in the country in general and Assam in particular with strong linkages of storage, marketing and distribution.

The department of Horticulture, Assam Agriculture University, Jorhat has been working for reducing the post harvest losses of the above-mentioned crops. Technologies for self-life extension of pineapple, oranges, banana, ginger and tomato have been standardized. Packaging system for long distant transportation of pineapples, oranges and tomato have been developed. A low cost storage structure for short time preservation of fresh fruits and vegetables has also been developed. This structure is suitable for the small and marginal farmers as well as for the retail fruit and vegetable seller of the state.

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***(Source : Directorate of Research (Agri) Assam Agricultural University, Jorhat April 2005)***