



RESEARCH NOTE

Development of a tool for effective mango harvesting to reduce post harvest loss

■ P.K. RATNA KUMAR*

Department of Botany, Andhra University, VISAKHAPATNAM (A.P.) INDIA

*Author for Correspondence

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SUMMARY :

Mangoes have played considerable role in the Indian economy. Due to globalization the value of mango production and trading was increased. To meet the demand and competition in International market attempt should be made to produce pest, disease free and quality fruits. During pre harvesting two major damages were occurred *i.e.* latex, bruise and blemishes. As per literature available mango with stalks intact had exhibited delayed shriveling. To avoid the above damages an attempt is made to design a cost effective tool with indigenous technology.

KEY WORDS : Mango, Harvesting tool, Post harvest loss

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Mangoes are an important and growing export product for Indian mango producers. Of several tropical and subtropical fruit grown, mango continues to dominate the fresh fruit basket contributing to 32 per cent of the total exports. However, the exported quantity as percentage of production is a meagre 0.4 % (2001 – 02). India accounts for over 45% of world mango production. However, India holds a share of around 5% in world trade as compared to Mexico (30%) and Brazil (12%) Shikhamani and Murti (2005).

However, current production and post harvest practices employed by producers significantly reduce potential income from mango sales, especially to small farmers producing this crop.

Losses are caused by a variety of factors – many of which can be controlled with minimum investment and training. Mechanical damage during harvest can become a serious problem, as injuries predispose produce to decay and loss (Anonymous, 1989). Assessment of losses indicated that fruits discarded in the field were 1.3%. Culled fruits ranged from 12 to 18% and were sold at lower prices. Physiological loss in

weight during transportation was 3.68%; Experiments proved that mangoes harvested with stalk could be stored better (Anonymous, 2001; Roy and Pal, 1991).

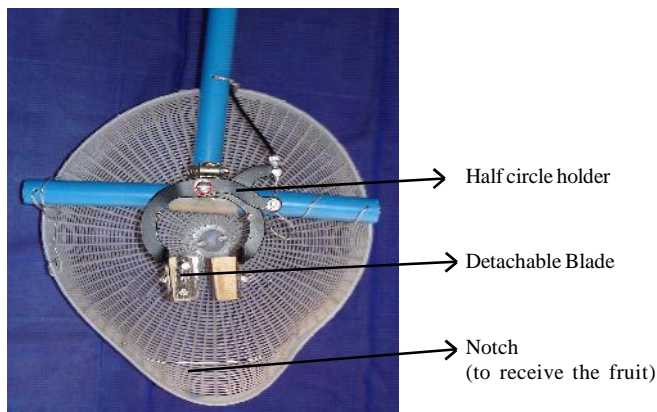
Growers need to be aware of the final consumer requirements as quality begins in the field. The quality of the fruit cannot be increased after harvest – it can only be maintained (Wasker *et al.*, 1997). The activities of the growers during harvesting and handling, therefore, play an important role in the quality of the fruit that exporters can ship, these are principally the harvest maturity, the harvesting techniques and transport to the collection points or the packing plant.

Harvest is carried out with picking poles either from the ground or climbing the tree and dropped to a catcher below. Most of the damage occurring at this point is not seen until later during ripening. There are at least three areas where mechanical damage can occur (Wasker *et al.*, 1997).

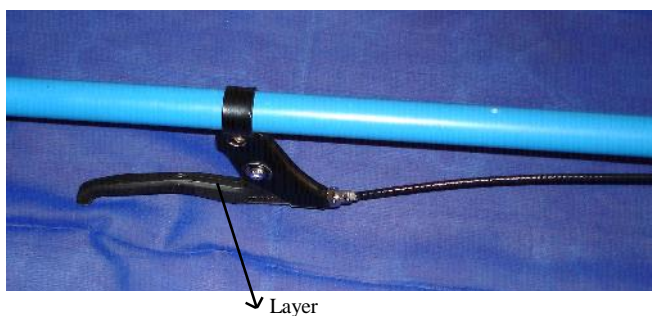
- At harvest as the fruit falls into the bag of the picking pole (Fruit to fruit), this is increased as more fruits are collected in the before emptying.



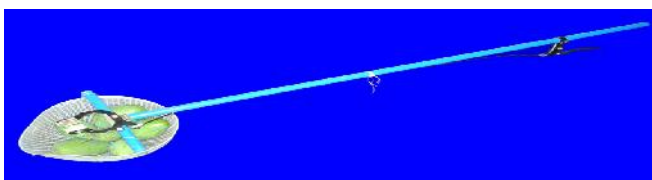
A. Full length of the DBAU mango harvester



B. Basket to receive the mango with cutting blades



C. Liver to press the blades during cutting



D. Full length of the DBAU mango harvester with mangoes



E. Basket with mangoes (Enlarged)

Plate 1 : DBAU mango harvester

- As it is caught by hand by the catcher on the ground.
- More than likely, the catcher then drops the fruit on to the ground where the latex is supposed to drain.

There is limited control of latex flow that almost always results in staining of the fruit. Additional problems may occur when the fruit is placed on the bare soil as soil sticks to the latex essentially creating a sand paper effect which scratches the skin. Also stem end rot caused by 'Diplodia' can be picked up from the soil, which will enter the broken stem.

To avoid most of the damages caused during harvest, a tool known as DBAU (Department of Botany Andhra University) mango harvester prototype was designed with locally available materials. It consists of a plastic basket with notch, round shaped blade holder (two half's), Detachable blades (the blades were arranged at 45° to facilitate easy cutting), lever to trigger the blades and a plastic pole to hold all the parts. The entire equipment weighs about 1.5 kg and 5.00 Feet in length. (Plate 1 A to E). Much study is needed to reduce the weight by using feather light material that will enable the harvester to work easily.

Harvesting practices should cause as little mechanical damage to produce as possible. Hence, improved harvesting tool named "DBAU Harvester" is designed to minimize losses.

- Added a cutting blade (Detachable blade) to the picking pole, so that the fruits are cut from the tree with the stem intact and are not 'ripped' off the tree. This will also reduce the effort required and will in most cases enable the fruit to be picked with the stem intact.
- As the blades are detachable there is no pressure on the hand, to harvest the fruits by simply pressing the liver (as the rough blades can be removed periodically).
- To avoid the damage caused during cutting the blades are arranged to the half circled holders with round edges.
- The plastic basket is used which will reduce the damage caused by branches of the tree when they were bringing to the ground.
- The notch, which is made in front, will receive the fruit easily even it is in bunches which is matured.
- During harvesting, hold the fruit stalk in between the blades and gently pull the harvester to harvest the fruit.
- Cost affective, even small farmers can afford to use.

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