ABSTRACT

Tamarind is a nutritious fruit with a variety of uses. The most valuable and commonly used part of the tamarind tree is the fruit. Recently, tamarind is used in agro-forestry systems in many parts of the country due to its multiple uses. Many farmers integrated several species, including tamarind with their agricultural crops and livestock. The increasing integration of tamarind with other trees and crops on farmlands offers a strategy to minimize the risk of crop failure during draught conditions.

Tamarind fruit can be harvested by hand picking, clipping with a hook mounted on a slick or by shaking the branches. The farmers generally process the tamarind fruit: by using traditional methods of seed expulsion such as beating with wooden mallet:, stone or hammer. Entire post harvest: operations like dehulling, defibring and deseeding are usually carried out simultaneously by engaging the labourers. But, the efficiency of these operations depended on labour availability and favourable weather conditions. The existing traditional post harvest process is tedious, time consuming, labour intensive and leads to low output.

Based on the study conducted in two tamarind growing districts of Karnataka state, it was concluded that seventy six per cent of the farmers employed hired labours for seed expulsion and only twenty four per cent family members helps in seed expulsion operation. Further 92 per cent farmers expressed their desire to develop power operated tamarind seed expeller. Native variety of tamarind has chosen for study. The shape of the fruits categorized into straight, curved and mixed.

The traditional methods of dehulling, deseeding and defibring operations were evaluated by engaging men and women labourers of
different age groups. Middle aged men and women labourers (31-50) performed better in seed expulsion as compared to other age-group labourers. However, more amount of mechanical damage of pulp and seed was noticed with young men and women labourers (15-30 years) during deseeding operation.

The physical, engineering properties and chemical composition of tamarind fruits were studied. The results helped in developing a power operated seed expeller. Two rollers one with serrated edge and another with helical rings used for separation of seed from tamarind fruit. The performance of the seed expeller was evaluated at different moisture content, different shaft speed and roller clearance with different shapes of fruits in comparison with traditional and manually operated machine.

Higher seed expulsion rate was found in power operated machine with straight fruits (23.34 kg/h) at 16.50 percent moisture content (wb) with shaft speed of 200 rpm and 4.50 mm clearance between the rollers. The least damage of pulp and seed found in this combination when compared with curved fruits and mixed fruits.

The seed expulsion efficiency (86.17%) was found more in power operated seed expeller with minimum pulp and seed damage when compared with other methods of expulsion.

The cost of economics of different methods of seed expulsion was studied. It was observed that the cost of seed expulsion found cheaper in case of power operated machine (Rs. 1.55/kg) compared with handle operated machine (Rs.2.94/kg) and traditional method (Rs.7.38/kg), From the results, power operated tamarind seed expeller was found economical, faster and less drudgery. Hence, proper awareness and education to the tamarind growers about usage of power operated tamarind seed expeller will help to promote this labour saving post harvesting machinery in future.