

Studies on Traditional Practices of Tamarind Processing

Viresh Kumar Goud^{1*}, R. Udhayakumar², Mohith Kumar G.V.¹ and Venkatachalapathy K.¹

Abstract: Tamarind fruit can be harvested by hand picking, clipping with a hook mounted on a stick 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.

Different age group labourers for both men and women were selected for conducting the post-harvest operations. The results recorded that middle aged men labourers performed better in dehulling as compared to young and old aged labourers. Higher seed expulsion rate (23.44 and 25.30 min/kg) was found high by engaging middle aged men and women labourers (31-50 years) compared to other aged groups. However, maximum mechanical damage (3.90%) was noticed with young men labourers. Aged women and men labourers took more time for defibring of tamarind fruits

Keywords: Tamarind, Dehulling, Seed Expeller, Defibring.

INTRODUCTION

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 part of the country due to its multiple uses. Many farmers integrated several species, including tamarind with their agricultural crops on farmlands offers a strategy to minimize the risk of crop failure during drought conditions.

In post-harvest operations dehulling, defibring and deseeding are the major process before storage. The farmers usually carried these operations simultaneously by engaging the labourers. Simple tools like wooden mallet or hammer will be used to separate seed from pulp. Among the post-harvest operations deseeding is considered to be important and it has to be done timely to prevent insect infestation. Almost all the post-harvest operations

are carried out by manually which is found labourious and time consuming. Besides, it depends on favorable weather conditions. The main objective of this study was to assess the Traditional practices adopted in tamarind dehulling, seed expulsion and defibring processes.

MATERIALS AND METHODS

Traditional Practices of Tamarind Dehulling, Seed Expulsion and Defibring

The study was conducted in Kolar and Bangalore rural districts of Karnataka state which are very popular in tamarind cultivation. Ten villages were selected based on the highest number of tamarind trees available. The common method adopted in the villages for dehulling is beating the harvested fruit with sticks and removing the shell. The dehulled fruits are kept for sun drying for 1-3 days, before

¹ Department of Agricultural Engineering, University of Agricultural Sciences, GKVK, Bangalore

² Professor of Agricultural Engineering, Gandhigram Rural Institute, Gandhigram, Tamilnadu

* E-mail: vkgouda@gmail.com

Received: 30 June 2020 • Revised: 22 July 2020 • Accepted 30 August 2020

deseeding, defibring process will take place manually for easy separation of seeds from pulp. The dried fruit is beaten with a wooden mallet to eject the seed from pulp. For assessment of existing dehulling, defibring and seed expulsion methods in rural areas, different age group skilled labourers were selected for the study. They are classified as young (15-30 years), middle aged (31-50 years) and aged (51-65 years).

At a time, skilled men and women labourers belonging to these age groups were weighed (kg) and allotted to each labourer for dehulling, defibring and seed expulsion operations. The starting and closing time of each operation were recorded in respect of each labourer. The cleaned fruits, degulled fruits, seed expulsion, defibring, percentage of damage and time were recorded. The average time taken by three groups of each gender was calculated and the procedure was replicated thrice.

RESULTS AND DISCUSSION

Dehulling of Tamarind Fruits

Existing practices for dehulling of tamarind fruits of different age groups is presented in Table 1. With the young women labour dehulling of tamarind was found to be highest in mixed fruits (69.30 sec/kg) which was statistically superior to rest of all the

treatments (58.00 to 67.33 sec/kg). Among the shapes of the fruit, mixed fruits recorded the higher dehulling in tamarind fruit (65.34 to 69.30 sec/kg) followed by curved fruit (62.00 to 69.30 sec/kg) and straight fruit (57.00 to 59.16 sec/kg). Among the different aged groups, young age recorded the highest dehulling in tamarind fruit (59.16, 64.66 and 69.30 sec/kg, respectively with straight curved and mixed fruits) followed by middle aged (57.63 and 67.33 sec/kg respectively with straight, curved and mixed fruits) and aged (58.62 and 65.34 sec.kg respectively with straight, curved and mixed fruits).

In general, mixed fruits with young aged labours performed better in the process of dehulling as compared to straight and curved fruits. With men labour also, the dehulling of tamarind fruit varied significantly with different shapes and age of gender. The highest dehulling was recorded in mixed fruits with young aged labour (70.33 sec/kg) followed by middle aged with mixed fruits (68.34 sec/kg) and aged (66.34 sec/kg) which were statistically superior to rest of the treatments (59.00 to 66.00 sec/kg). Among the shapes of the fruits, mixed fruits recorded in higher dehulling of tamarind (66.34 to 70.33 sec/kg) followed by curved fruit (65.00 to 66.00 sec/kg) and straight fruit (59.00 to 62.00 sec/kg).

Among the different age group men labourers young labourers recorded highest dehulling of tamarind (70.00, 66.00 and 62.00 sec/kg respectively with mixed fruits curved and straight fruits) followed by middle aged (68.34, 65.00 and 61.00 sec/kg respectively with mixed fruits, curved and straight fruits) and aged men (66.34, 65.00 and 59.00 sec/kg respectively with mixed fruits, curved and straight fruits). However, efficiency of the age groups and different genders are on par with others. This might be due to the fact that farmers are engaging only skilled labourers for dehulling operation as compared to younger generation. This is in confirmation with Hiregouder (2000).

Mechanical Damage in Dehulling of Tamarind Fruits

The data pertaining to this parameters are presented in Table 2. The mechanical damage differs significantly among men and women labourers. The mechanical damage was more in young aged labourers as compare to aged and middle aged

Table 1
Dehulling rate of tamarind fruits by different age groups (sec/kg)

Treatments	Men labour	Women Labour
Straight fruit + Aged	58	59
Straight fruit + Middle	57	61
Straight fruit + Young	59.16	62
Curved fruit + Aged	62	66
Curved fruit + Middle	63	65
Curved fruit + Young	64.66	66
Mixed fruit + Aged	65.34	66.34
Mixed fruit + Middle	67.33	68.34
Mixed fruit + Young	69.30	70.33
F Test	*	*
S. Em±	0.16	0.34
CD at 5%	0.46	0.98

* Significant

Table 2
Mechanical damage (%) in dehulling of tamarind fruits by different age groups

Treatments	Men labour	Women Labour
Straight fruit + Aged	3.90	4.34
Straight fruit + Middle	1.83	2.33
Straight fruit + Young	5.16	6.02
Curved fruit + Aged	4.50	5.56
Curved fruit + Middle	3.45	4.00
Curved fruit + Young	6.70	7.10
Mixed fruit + Aged	4.83	5.23
Mixed fruit + Middle	4.00	5.01
Mixed fruit + Young	5.33	6.00
F Test	*	*
S. Em±	0.14	0.31
CD at 5%	0.42	0.89

* Significant

labourers. Highest mechanical damage was observed in curved fruits (7.1%), straight fruits (6.02%) and mixed fruits (6.0%) for young women labourers. Least damage was recorded in straight fruits for middle aged men (1.83%) and women (2.33%) labourers. This might be due to experienced labourers functioning efficiently with patience.

Seed Expulsion of Tamarind Fruits

The data on existing practices of seed expulsion of tamarind fruits of different age groups are presented in Table 3. The observation on the output of tamarind seed expulsion as influenced by different shape and age of gender was found to be significant. The output in straight fruits was comparatively quicker than curved and mixed fruits. The seed expulsion output by women labourers in the straight, curved and mixed fruits was 26.40, 25.30, 25.90, 26.70, 25.40, 24.40 and 27.60, 27.90, 26.60 min/kg in aged, middle aged and young labourers respectively.

Similar output results were observed among men labourers in straight, curved and mixed fruits were 24.97, 23.44, 24.61, 26.03, 26.49, 26.00 and 27.10, 27.90, 27.00 min/kg in aged, middle aged and young labourers respectively. The results clearly show that the middle aged labourers had higher seed expulsion efficiency compared to aged and

Table 3
Seed expulsion rate of tamarind fruits by different age groups (min/kg)

Treatments	Men labour	Women Labour
Straight fruit + Aged	24.97	26.40
Straight fruit + Middle	23.44	25.30
Straight fruit + Young	24.61	25.90
Curved fruit + Aged	26.03	26.70
Curved fruit + Middle	26.49	25.40
Curved fruit + Young	26.00	24.40
Mixed fruit + Aged	27.10	27.60
Mixed fruit + Middle	27.90	27.90
Mixed fruit + Young	27.00	26.60
F Test	*	*
S. Em±	0.01	0.03
CD at 5%	0.04	0.09

* Significant

young labourers. This might be due to their application of skills functioning experience and energy. Similar findings have been reported by Sharanakumar (2001).

Mechanical Damage in Seed Expulsion of Tamarind Fruits

Significant difference was observed with mechanical damage of fruits in both labourers. The data pertaining to this parameter are presented in Table 4. The mechanical damage was more by aged and young labourers than the middle aged labourers. Highest mechanical damage of men labourers was observed for mixed, curved and straight fruits was 5.20, 4.90, 5.76, 3.45, 3.87, 4.15 and 3.06, 3.01, 3.15 per cent in young middle aged and aged labourers respectively. Similar trend was also recorded among women labourers in mixed, curved and straight fruits was 5.00, 4.53, 5.56, 4.01, 3.74, 4.05 and 2.86, 2.62, 2.92 per cent in young middle and aged labourers respectively. Once again, the age and energy factors were responsible for more damage.

Defibering of Tamarind Fruits

The data pertaining to this parameter are presented in table 5. The output of defibering fruit by genders in different age groups differed significantly. The

Table 4
Mechanical damage (%) in Seed expulsion of tamarind fruits by different age groups

Treatments	Men labour	Women Labour
Straight fruit + Aged	3.15	2.93
Straight fruit + Middle	3.01	2.62
Straight fruit + Young	3.06	2.86
Curved fruit + Aged	4.15	4.05
Curved fruit + Middle	3.87	3.74
Curved fruit + Young	3.45	4.01
Mixed fruit + Aged	5.76	5.56
Mixed fruit + Middle	4.90	4.53
Mixed fruit + Young	5.20	5.00
F Test	*	*
S. Em±	0.02	0.05
CD at 5%	0.07	0.16

* Significant

Table 5
Defibering rate of tamarind fruits by different age groups (min/kg)

Treatments	Men labour	Women Labour
Straight fruit + Aged	15.16	16.23
Straight fruit + Middle	14.56	15.70
Straight fruit + Young	15.83	15.96
Curved fruit + Aged	16.33	16.84
Curved fruit + Middle	15.50	16.34
Curved fruit + Young	16.16	16.57
Mixed fruit + Aged	14.50	15.66
Mixed fruit + Middle	14.17	14.83
Mixed fruit + Young	15.34	15.84
F Test	*	*
S. Em±	0.07	0.15
CD at 5%	0.21	0.45

* Significant

defibering by men labourers in straight, curved and mixed fruits was 15.16, 14.56, 15.83, 16.33, 15.50, 16.16 and 14.50, 14.17, 15.34 min/kg in aged, middle aged and young labourers respectively. Defiberring by women labourers was comparatively slower than that of men labourers. The defibering by women labourers in straight, curved and mixed fruits was 16.23, 15.70, 15.96, 16.84, 16.34, 16.57 and 15.66,

14.83, 15.84 min/kg in aged, middle aged and young labourers respectively. The data clearly indicated that, the middle aged labourers performed better as compared to other labourers. This might be due to their age, energy and experience.

CONCLUSION

The study revealed that at present all the farmers are adopting traditional methods of seed expulsion and farmers perceived that they are using wooden mallet due to non-availability of improved machines. Most of the farmers suggested to develop an efficient tamarind seed expeller with low cost and easy to operate.

Different age group labourers for both men and women were selected for conducting the post-harvest operations. The results recorded that middle aged man labourers performed better in dehulling as compared to young and old aged labourers. Higher seed expulsion rate (23.44 and 25.30 min/kg) was found high by engaging middle aged men and women labourers (31-50 years) compared to other age groups. However, maximum mechanical damage (3.90%) was noticed with young men labourers. Aged women and men labourers took more time or defibering of tamarind fruits.

ACKNOWLEDGEMENT

This study was carried out as part of Ph. D research program. The authors are grateful to Gandhigram Rural Institute-Deemed University (MHRD-Govt. of India), Gandhigram and University of Agricultural Sciences, Bengaluru for providing required facilities for conducting research work.

References

- Hiregoudar, S., (2000), Development and testing of a prototype tamarind defibering machine. UAS, Bangalore unpublished M.Sc. (Ag. Engg.) thesis.
- Shivanandam, V.N. (1980), Studies on systematic selection of productive types of tamarind (*Tamarindusindica L.*). M.Sc (Agri) thesis submitted to University of Agricultural Sciences, Bangalore.
- Sharankumar, H. (2001), A comparison of traditional and mechanical processing of tamarind fruit. *Curr. Res.* 193-194.