

Studies on Seed Expulsion Practices of Tamarind in Rural Parts of Karnataka State

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Abstract: Tamarind is an economically important multipurpose spice which is grown both as domesticated spice in farmland and as wild in forest lands. Tamarind fruits can be processed in the variety of food products of commercial importance. The knowledge about physical properties and traditional method of post-harvest operations are very important for designing processing equipments. 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 percent 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 deferring operations were evaluated by engaging men and women labourers of different age groups. Middle aged men and women labourers (31-50 years) 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.

Keywords: Tamarind, seed expeller, tamarind processing, tamarind pulp.

INTRODUCTION

Tamarind (*Tamarindus indica* Linn.) is one of the most extensively planted and highly valued trees in India and it is intimately associated with the common man. It belongs to the family *Fabaceae* (Leguminosae) and sub family *Caesalpiniaceae*.

Tamarind tree is grown widely in the tropical and sub-tropical regions of the Indian sub-continent alongside of the roads, avenues, in and around villages as a multipurpose tree species and also in agro forestry systems. But the commercial cultivation of the tree was initiated in the recent days only. The tree is commonly found in India in the states of Tamil Nadu, Karnataka, Bihar, Madhya Pradesh, Andhra Pradesh and Kerala. In Karnataka, Tamarind is grown extensively both in cultivated and rainfed conditions. In Karnataka state, tamarind occupied an area of 26,177 ha, producing 23,559 tonnes of pulp (Babu, et al., 2009).

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 who depends on favorable weather conditions. There is no much study was conducted in developing post-harvest machinery for tamarind especially to take care of seed expulsion. The main objectives of conducting a survey was to identify the problems relating to tamarind seed expulsion practices followed in tamarind growing areas of Karnataka state.

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MATERIALS AND METHODS

An interview schedule was prepared for collecting data of the study after perusal of available literature and through consultation with experts in the field of extension and progressive farmers.

The survey was undertaken as per the well prepared schedule. 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. Further, consultation and preliminary visits were undertaken to the selected villages. To have a better representation among tamarind growing farmers, it was decided to select 5 farmers randomly from each selected villages. To have a better representation among tamarind growing farmers, it was decided to select 5 farmers randomly from each selected villages. Totally, fifty farmers were personally interviewed with the help of specially prepared schedule to assess the tamarind seed expulsion practices and their related problems and socio-personal characteristics of the farmers. The data were tabulated and analyzed.

RESULTS AND DISCUSSION

Socio Personal Characteristics of the Farmers

The socio-personal characteristics of the tamarind growing farmers under the study, farmer's perceptions about seed expulsion are presented in Table 1. The data reveals that a vast majority (80%) of the farmers were above 40 years old. Only 20 per cent of the farmers were less than 40 years of age. The observed pattern of distribution of farmers according to age is in line with the general trend observed in Karnataka state where the younger generation keeps away from farming (State Planning Board 2001). It was observed that 14.00 per cent farmers are illiterate and 26.00 per cent farmers were having degree or above educational qualification. Remaining farmers are having primary (20%), high school (24%) and pre-degree (16%) education.

The adoption of improved farming practices by the cultivators would be influenced by the extent of their involvement in farming as major source of income for their livelihood. Among the respondents,

Table 1
Distribution of farmers according to their socio-personal characteristics

Sl. No.	Characteristics Category	No. of farmers		
		Frequency	Percent	
1.	Age	< 35 years	10	20
		35-60	27	54
		> 60	13	26
2.	Education	Illiterate	7	14
		Primary	10	20
		High School	12	24
		Pre degree	8	16
		Degree and above	13	26
3.	Occupation	Farming alone	22	44
		Farming +Agricultural labour	3	6
		Farming + Private job	9	18
		Farming + Govt. job	2	4
		Farming + Business	14	28
4.	Family size	< 5	13	26
		5-10	22	44
		> 10	15	30
5.	Farm size	< 0.5 ha	6	12
		0.5-1.0 ha	11	22
		1.0-1.5 ha	29	58
		> 1.5 ha	4	8
6.	Farming experience	< 10 years	7	14
		10-25 years	19	38
		> 25 years	24	48
7.	Annual income	< 10000	11	22
		10000-15000	22	44
		> 15000	17	34

only 44 per cent were depending on farming alone as their source of livelihood. Nearly one-third (34%) of the farmers were having annual income of more than Rs. 15000 and 22 percent of the farmers were having their annual income less than Rs. 10000. As discussed in the case of farm size, annual income of

Table 2
Labour utilization pattern for seed expulsion

Sl. No.	Source of Labour	No. of farmers	Per cent
1.	Self and Family member	12	24
2.	Hired labour	38	76
<i>Total</i>		50	100

farmers also influence the extent of adoption of improved farm technologies. Extent of adoption of improved farm technologies tends to be higher by farmers with more income than their counterparts having less income as reported by Hiregoudar[2].

The Labour Utilization Pattern for Seed Expulsion

The labour utilization pattern for seed expulsion of tamarind furnished in Table 2. It can be seen from the results that a vast majority (76%) of farmers employed hired labourers for seed expulsion of tamarind fruits. Whereas only 24 per cent farmers utilized family members. Seed expulsion of tamarind using the traditional method such as using wooden mallet is a skilled work and hence farmers mostly depend on hired labour for the same and have to invest more money to complete the operation in time.

The Practices Adopted by Farmers for Seed Expulsion

The practices adopted by farmers for seed expulsion are presented in Table 3. The results indicated that majority (82%) of the farmers are using wooden mallet for seeds expulsion and remaining farmers are using hammer (6%) and stone (12%).

It was observed that all the farmers included in the study resorted to wooden mallet for seed expulsion irrespective of the purpose either for

Table 3
Practices adopted by farmers for seed expulsion

Sl. No.	Method	No. of farmers	Per cent
1.	Using wooden mallet	41	82
2.	Using hammer	3	6
3.	Using stone	6	12
<i>Total</i>		50	100

Table 4
Constraints experienced by farmers in adopting traditional methods of seed expulsion

Sl. No.	Method	No. of farmers	Per cent
1.	During cold/ rainy season seed expulsion is difficult	23	46
2.	Requires more labour and time	44	88
3.	Chances of finger injuries	33	66
4.	Non-availability of machine	41	82
5.	Non-availability of labours for timely operation	28	54

• More than one response was obtained.

expelling small quantity for household use or for market purpose. These results are in linewith the findings of Shivanandam (3).

Constraint Experienced by Farmers in Adopting Traditional Methods of Seed Expulsion

The farmers opined that they adopt the traditional method of seed expulsion (100%) using wooden mallet for seed expulsion mainly because there is no improved machine available (82%) which is superior to mallet. Further, all the farmers perceived that the traditional method of using mallet for seed expulsion was less efficient and time consuming (88%) requires some amount of skill and can cause injury (66%) if not properly handled.

The results indicated that need for developing a suitable machine which will be more efficient, easy to operate and economically viable (Table 4). Due to the failure of monsoon, farmers slowly adopting agro forestry system and there are enough opportunity to grow tamarind as a commercial crop.

Hence, there is a need develop and fabricate an efficient tamarind seed expeller to enable farmers to overcome the constraints experienced in seed expulsion. It is evident from farmers (46%) that it is difficult to separate of tamarind seed and pulp during cold and rainy season. This might be due to the reason that, pulp become soft and sticky as pectolytic degradation takes place and moisture is observed and was also quoted by Lewis [3]

Table 5
Farmers suggestion for developing an improved tamarind seed expeller

Sl. No.	Suggestions	No. of farmers	Per cent
1.	Develop an expeller which does not use more electrical energy	43	86
2.	Develop a tamarind seed expeller with low cost and high efficiency	46	92
3.	Easy to operate and less maintenance	37	74
4.	Preferably manual handle operated	26	54

Suggestions of Farmers for Developing a Tamarind Seed Expeller

Based on the experience of adopting traditional methods of seed expulsion, farmers gave suggestions for the development of an improved tamarind seed expeller. The suggestions of farmers are summarized in Table 5.

Majority of the farmers gave suggestions to develop a tamarind seed expeller with low cost and high efficiency (92%). In rural areas electricity is a major problem for running a machine. Most of the adopters feel that developed machine should take minimum electrical energy for operation (86%). Ease of operation and maintenance was the most important attribute for the design of an improved machine as perceived by the farmers (74%). Besides farmers also suggested to make provision for handle (54%) to the developed seed expeller. It is worthwhile to note here that these suggestions were matching with the constraints experienced in the adoption of traditional practices. Hence, it is important that these suggestions are taken care

while developing a seed expeller. This might be due to simplicity of the innovation is an important factor influencing the extent of adoption of innovation.

CONCLUSION

The study revealed that at present all the farmers (100%) are adopting traditional methods of seed expulsion and farmers perceived that they are using wooden mallet due to non-availability of improved machines (82%). Most of the farmers suggested (92%) 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.

References

- Babu, C.K., (2009), A report on Post-harvest process of Tamarind, University of Agricultural Sciences, Bangalore.
- Hiregoudar, S., (2000), Development and testing of a prototype tamarind defibering machine. UAS, Bangalore unpublished M.Sc. (Ag. Engg.) thesis.
- Lewis, Y.S., (1970), Tamarind concentrate. *Ind. Food Packer*.
- 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.