



## ADOPTION OF POST-HARVEST MANAGEMENT PRACTICES IN PIGEONPEA CROP FOR SUSTAINABLE INCOME

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### ABSTRACT

A study was conducted in Gulbarga district of North Karnataka during the year 2013-14 to know the extent of adoption of post harvest management practices adopted by the pigeonpea growers. By following purposive sampling 120 respondents were selected from the district. The data was elicited through personnel interview method using structured interview schedule and analyzed using mean, standard deviation, frequency and percentage. The results of the study revealed that, less than half of respondents (41.67 %) belonged to medium level of adoption category. With respect to individual post harvest management practices, large majority (91.66 %) of the respondents harvesting their produce by sickle, majority (87.50 %) of the respondents followed the practice of beating with sticks. Over one third (38.33 %) of the respondents adopted grading by manual winnowing at the time of cleaning, majority (86.66 %) of respondents adopted transportation by tractor. In case of marketing majority (75.00 %) of the respondents were sold their produce in APMC. In case of value addition, cent per cent of respondents were used for dhal making, followed by husk as animal feed (35.00 %). Majority of the respondents faced the problem of high fluctuation in market prices (71.66 %), followed by non-availability of processing units at village level (45.83 %) and inadequate storage facility at village level (35.83 %).

**KEY WORDS:** Adoption, Pigeonpea and Post-harvest management practices

### INTRODUCTION

Pigeonpea or Redgram (*Cajanus cajan L.*) is most important pulse crop of tropics and sub tropical region of the world. It ranks second important pulse crop next to the bengalgram. Pigeonpea is considered to be origin of peninsular India. It is a perennial shrub and a short annual crop in India and as a perennial in many other countries, where the pods are harvested at regular interval. Agricultural development has to major aspects, one is production and another one is post-harvest processing. Until now we have concentrated our efforts on agricultural production and neglected post-harvest processing of farm and animal products. Technology of post-harvest processing of agricultural products refers to the processes and treatments carried out on an agricultural product after it is harvested. It starts from the selection of proper harvest and ends with marketing. All processes such as harvesting, threshing, drying, storage, parboiling, milling, sorting, grading, packing, transport, marketing etc., are included under this term. One of the unfortunate attribute to this post-harvest system is that it is very difficult to come out with accurate figures of loss or wastage but in case of food grains some estimates suggested that in developing countries as much as one forth to one third of total product may be lost as a result of inefficiencies in the post-harvest system. A grain saved is a produced. Ample evidence and statistics are available where in the loss occur from harvest till it reaches customers. At present more attention is required on primary processing aspects

which include cleaning, grading, drying dehydration, storage, milling, packaging and transportation.

A post-harvest loss of fruits and vegetable is 22 to 40 per cent, pulses, oilseeds and cereals is 10 to 30 per cent. These losses mainly arise because of improper harvesting methods, problems of threshing, storing, transportation and processing leads to large-scale losses in food grains. Thus, the post-harvest losses obviously have an impact on the economy. In Karnataka, there is thinking that, there is a considerable loss of Red gram in post-production operations. There are no specific recommendations made as those of improved varieties of crops and there production technology. Farmers based on their experience do adopt post-harvest technology. Some innovative farmers might have adopted the scientific post-harvest technologies. But, there is no objective information on these aspects and no reliable study has been done so far. Keeping these facts and figures in mind, the present study was conducted to with an objective to know the extent of adoption of post harvest management practices adopted by the pigeonpea growers.

### METHODOLOGY

The research study was conducted in Gulbarga district of Karnataka state. The district was purposively selected as it ranks first in area and production of pigeon pea. Gulbarga district consists of seven taluks, and pigeonpea is grown in all the seven taluks. Two taluks namely Gulbarga and Jewargi were selected for the study based on highest area under pigeonpea cultivation. The List of villages was

prepared from the selected taluks and from the list, four villages in each taluks were selected by simple random sampling method and from each selected village, 15 respondents were selected randomly. Thus, total sample size constitutes 120 respondents. Based on the objectives of the study, an interview schedule was prepared. The information was elicited from the respondents with the help of structured interview schedule. The data collected was analysed using appropriate statistical tools.

**RESULTS AND DISCUSSION**

**Extent of adoption of post-harvest management practices in pigeonpea**  
**Overall adoption of post-harvest management practices in pigeonpea**

The data in Table 1 indicates the overall adoption post-harvest management practices by the pigeonpea growers. Majority (41.67 %) of the respondents belonged to medium level of adoption category followed by low (30.00 %) to high (27.50 %) adoption categories

**TABLE 1:** Overall adoption of post-harvest management practices in pigeonpea n=120

Sl. No.	Particulars	Categories	Frequency	Percentage
1	Low	Less than Mean - 0.425*SD	37	30.83
2	Medium	Between Mean ± 0.425*SD	50	41.67
3	High	More than Mean + 0.425*SD	33	27.50
		Total	120	100
			Mean=18.5	SD=2.2

**TABLE 2:** Extent of adoption of post-harvest management practices in pigeonpea n=120

Sl. No.	PHM* Components	Particulars	Frequency	Percentage
1	Harvesting	By sickle	110	91.66
		Combined harvester	10	8.33
2	Drying	Plant uprooting	00	0.00
		Sun drying	120	100.00
3	Threshing	Beating with sticks	105	87.50
		Pigeonpea thresher	15	12.50
4	Cleaning	Combined harvester	07	5.83
		Hand picking	56	46.66
		By using electric fan	10	8.33
5	Grading	Manual winnowing at the time of cleaning	40	38.33
		Manual grading with bigger hole sieves	06	5.00
6	Bagging	Grading by using sieves	00	0.00
		Jute (gunny) bag	107	89.16
		Polythene bag	10	8.33
7	Storage	Mud bin	03	2.50
		Godown	07	5.83
8	Management of Storage pests	House hold/domestic store room	113	94.16
8.1	Through Chemicals	Aluminium phosphate	08	6.66
		Malathion	21	17.50
8.2	Through ITK's	EDB Empules	13	10.83
		Mixing grains with wood ash	09	7.50
9	Transportation	Smearing of castor oil on the grains	0	0.00
		Uses of Different botanicals	15	12.50
		Bullock cart	06	5.00
9	Transportation	Tractor	104	86.66
		Tata ace	11	9.16
		APMC	90	75.00
10	Marketing	Commission agents	30	25.00
		Retailers	00	0.00
		Dhal making	120	100.00
11	Value addition	Numkin	00	0.00
		Flour (papad making)	13	10.83
		Husk as animal feed	42	35.00
12	Utilization pattern of pigeonpea stalks	Pigeonpea stalk used as fuel	84	70.00
		Incorporation near bunds	20	16.66
		Compost/ Vermicompost preparation	16	13.33
13	Yield	Average yield per hectare	10-12qt	46.000

\*PHM- post-harvest management

Majority of the respondents belonged to medium knowledge category with respect to post harvest management practices and these practices are practiced since ages. The respondents have adopted practices which are simple in nature. These might be the probable reasons for the above findings.

#### **Individual practice wise Extent of adoption of post-harvest management practices in pigeonpea**

The Table 2 reveals that, large majority (91.66 %) of the farmers adopted harvesting by using sickle. The possible reason for this might be that, it is the easy, cheaply available and most convenient method of harvesting. Very meagre *i.e.* 8.33 per cent of the respondents used combined harvester. Cent per cent of the farmers adopted sun drying method, the possible reason for this type of result might be due to the fact that, sun drying is the natural process and it is free of cost and no need for any training to the farmers.

In case of threshing, cent per cent of the respondents adopted threshing by beating with sticks, 12.50 per cent of the respondents adopted pigeonpea thresher followed by combined harvester (5.83 %). This might be due to the fact that, it is traditional and indigenous technology as adopted by their ancestors. The findings of the study were supported by the result of Raghavendra (2004).

In case of cleaning, more number of respondents (46.66 %) followed hand picking followed by electric fan (8.33 %). The possible reason for this might be that the hand picking is easy and less costly method. These results are inline with findings of Raghavendra (2004).

In case of grading, most of the farmers use manual winnowing at the time of cleaning (38.33 %) followed by manual grading by hand sieves with bigger holes. This might be due to lack of awareness about importance of grading. In study area grading is practiced only in processing industries where large quantity of grains is processed. None of the farmers adopted grading by scientific methods like using sieves. The possible reasons that could be attributed for non adoption might be because of lack of scientific knowledge and lack of extension efforts to create awareness about importance of grading. The above findings were in agreement with the findings of the studies conducted by Sunil Kumar (2004).

In case of bagging of pigeon pea, 89.16 per cent of respondents adopted Jute (gunny) bag followed by polythene bag (8.33 %). Very less per cent of the respondents adopted improved packing systems. The possible reason may be the non availability of such things to farmers and also may be due to lack of knowledge about improved packing systems. The findings of the study are in accordance with the findings of Sunil Kumar (2004). In case of the storage, large majority (94.16 %) of the respondents stored the produce in house/domestic store room while only 5.83 per cent of the respondents sold their produce immediately after harvest due to non availability of storage facility at village level. The findings of the study are in accordance with the findings of Raghavendra (2004).

In case of the management of storage pests through chemicals and through ITK's, 17.50 per cent of the respondents used chemicals *i.e.* by EDB (Ethyl dibromide) (10.83 %) and aluminium phosphate (6.66 %)

respectively and in case of ITK's, 12.50 per cent of the respondents used different botanicals, like neem, followed by mixing grains with wood ash and stored in pot (7.50 %). The possible reasons might be due to lack of extension efforts to create awareness about importance of management of storage pests. Majority of farmers sold their produce immediately after harvest and no one wants to store their produce. The findings of the study are in accordance with the findings of Sunil Kumar (2004) and Govinda Gowda and Narayana Gowda (2004).

With regard to transportation, majority of respondents adopted transportation by tractor (86.66 %) followed by TATA ace (9.16 %) and bullock cart (5.00 %). The possible reason might be due to that, it is the easy, less costly and most convenient method. Very least per cent were using TATA ace due to non availability of other transportation facilities at village level and also it will not transport large volume of produce. The absence of collective efforts in marketing and lack of knowledge of profitable marketing could be the possible reasons for the above findings. The findings of the study are in accordance with the findings of Ravikumar (2010).

In case of marketing, majority of respondents sold their produce in APMC (75.00 %) followed by commission agents (25.00 %). The probable reason might be to get good price for their produce and to get more number of buyers. Commission agents are having good exposure to the market and one having contact with large buyers. Hence, growers were willing to sell their produce through commission agents for a good price. The findings of the study are in accordance with the findings of Sidram (2008).

In case of value addition, cent per cent of respondents prepare dhal followed by pigeonpea husk as animal feed (35.00 %) and flour for papad making (10.83 %). The possible reason for this might be that, it is the easy, less costly and most convenient to farmers. Very less farmer adopted papad making and no one adopted numkeen making out of pigeonpea. The possible reasons for not adopting the value addition might be because of lack of scientific knowledge and also non availability of investment capital. In case of utilization pattern of pigeonpea stalk, majority of the farmers use pigeonpea stalks as fuel (70.00 %) followed by incorporation of stalks near to bunds (16.66 %) and for vermicompost preparation (13.33 %). The possible reason for this is that it is easy, less costly and most convenient to farmers and in case of vermicompost preparation, farmers lack scientific knowledge and extension efforts to create awareness about vermicompost preparation. The findings of the study are in accordance with Sheela (1991).

By adopting the major and important post-harvest management practices like proper threshing, bagging, grading and with proper storage, the farmers were getting an average yield of 10-12q/ha and earning a profit of Rs.46.000.

#### **Constraints faced by pigeonpea growers in adoption of post-harvest management practices**

The results pertaining to constraints faced in adoption of post-harvest management practices by pigeonpea growers is presented in Table 3. Majority of the respondents faced the problem of high fluctuation in market prices (71.66 %), followed by non availability of processing units at

village level (45.83 %) and inadequate storage facility at village level (35.83 %), are the other constraints faced by the respondents due to inadequate storage facilities in rural areas, farmers lose a substantial quantity of their produce. Farmers sell their produce just after harvest due to lack of storage facilities. Hence, rural godowns are must, to avoid the sale immediately after the harvest. The non-availability of labours (34.16 %) might be due to the migration of labours to the city. There are many malpractices (28.33 %) prevailing in markets like excess weightment, delay in payment (12.50 %), different kinds of arbitrary deductions for religious and charitable purposes from producers, high commission charges, delay in weighing, loading, unloading and weighing charges from producers, and loss of produce through traders sampling in open market (21.66 %) by high wages of labour (23.33 %). Generally, the price of Pigeonpea prevails low in early post-harvest

period due to more arrivals in the market and later on prices go up. Due to this unstable price, the farmers get lesser price and other reason is low knowledge level and low adoption of the improved post-harvest management practices. The middle man and commission agents charge is more (22.50 %), which might be the reason for the existence of a long chain of middlemen and commission agents and this reduces the share of the consumer's price. The lack of transportation facility at producers level (19.16 %). Due to inadequate transportation facilities at village level, producers sell their produce directly to traders, which offer them lesser price than prevailing in the markets. The heavy incidence of storage pests (10.83 %), due to lack of awareness about post-harvest management practices through chemicals. These results are in agreement with the findings of Vijayakumar (1997), Kumar (1998) and Sunil Kumar (2004).

**TABLE 3:** Constraints faced by pigeonpea growers in adoption of post-harvest management practices n=120

Sl. No.	Constraints	Frequency	Percentage	Rank
1	High fluctuation prices in market	86	71.66	I
2	Non availability of processing units at village level	55	45.83	II
3	Inadequate storage facility at village level	43	35.83	III
4	Non availability of labour	41	34.16	IV
5	Involvement of malpractice in weight measurement	34	28.33	V
6	High wages of labour	28	23.33	VI
7	Middle man/agent charge is more	27	22.50	VII
8	Loss of produce through traders sampling in open market	26	21.66	VIII
9	Lack of transportation facility at producers level	23	19.16	IX
10	Delay in payment in APMC	15	12.50	X
11	Heavy incidence of storage pests	13	10.83	XI

## CONCLUSION

It can be concluded for the above results that, less than half of respondents belonged to medium level of adoption category. With respect to individual post harvest management practices, large majority of the respondents harvesting their produce by sickle, majority of the respondents followed the practice of beating with sticks. Over one third of the respondents adopted grading by manual winnowing at the time of cleaning, majority of respondents adopted transportation by tractor. In case of marketing majority of the respondents were sold their produce in APMC. In case of value addition, cent per cent of respondents were used for dhal making, followed by husk as animal feed. Majority of the respondents faced the problem of high fluctuation in market prices followed by non-availability of processing units at village level. Majority of the farmers had not adopted improved post harvest technologies such as grading, packing and value addition. Though the farmers are in hurry to sell their produce due to economic compulsion, the policy makers and other agencies have to come forward to finance the growers in advance. There is a need to create awareness among the pigeonpea growers regarding the importance of adoption of post harvest management practices for getting higher income through intensive extension activities.

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