

## RESEARCH PAPER

# Knowledge and adoption of post harvest management practices by farmers

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## ABSTRACT

The post-harvest losses in food grains and horticultural crops has been reported to be more (15-50%) in recent past. It is mainly due to their knowledge level, interest and facilities available. An attempt has been made to know the knowledge and adoption level of farmers about post-harvest management practices. The study was conducted in Haveri and Dharwad districts of Karnataka state with the sample size of 120 farmers. The data were elicited through the personal interview method. Most (46.67%) of the farmers adopting improved method were found in high knowledge index category. In case of farmers with traditional method all most equal percentage of farmers were found in high (36.67%) and medium (35.00%) knowledge index category. Slightly higher per cent of respondents belonged to medium adoption category. Use of wooden planks/ mat for staking gunny bags, cleaning and drying which are manually practiced were adopted by majority of the farmers adopting traditional as well as improved method of grain storage. Some of the traditional methods for checking insects and rats were followed by small per cent (10-30%) of the respondents.

**Key Words :** Knowledge, Adoption, Grain storage, Management practices

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Agriculture has made a steady progress since the mid-sixties with the advent of green revolution during which period the country moved forward from a state of low productivity to the level of self – sufficiency in food grains. However, the post harvest losses of food grains and oilseeds are estimated to be 10 to 20 per cent, while that of different horticultural crops vary from 15 to 50 per cent (Chahal, 2011) in developing countries including India. The bulk of these losses occur during storage for most of the commodities. Every year million tonnes of food grains worth several hundred crores of rupees are either damaged or lost mainly due to lack of knowledge of scientific methods of storage of food grains. The losses during storage are mainly due to the storage method and management practices adopted by the farmers. The damage is affecting both quality and quantity of grains. Hence, it is essential to know the knowledge and adoption level of farmers about different grain storage practices, so that effective storage methods can be recommended to the farmers.

## RESEARCH METHODOLOGY

The study was conducted in the year 2010-2011 in Haveri and Dharwad districts of Karnataka state. Haveri and Dharwad districts were purposively selected because, improved methods of grain storag namely *Pucca koti* and

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metal bins were demonstrated and adopted in selected villages under Canadian International Development Agency (CIDA) project implemented during 2003-2008. Two taluks in each district were selected for the study. The list of farmers in selected villages who have adopted improved methods of grain storage was collected from the project reports and in discussion with project team members. Sixty farmers from five villages were selected by following proportionate random sampling method. In order to compare with traditional methods equal number of farmers who have not adopted improved method in same village were selected. Thus, total of 120 respondents constituted sample for the study. The pre-tested interview schedule was used to collect the data by personal interview method. The data collected were tabulated and analyzed by using suitable statistical measures.

## RESULTS AND REMONSTRATION

The results in Table 1 depict that cent per cent of farmers adopting traditional method and improved method had knowledge about cleaning of seeds to separate foreign bodies and use of wooden planks/board/mats/plastic sheet/straw to keep gunny bags. Since these practices are very common and easy to follow all farmers were having knowledge about these practices.

Over 90.00 per cent of the farmers adopting improved method and farmers adopting traditional method had knowledge about use of neem leaves/ *vitex negunda* followed by keeping bags in well ventilated place, sun drying to 10 per cent, use of rat traps. It is also observed in the present study that majority of respondents following improved method and traditional method also had knowledge about fumigation by using aluminium phosphide tablets (90.00% and 81.67%), cat rearing (88.33% and 98.33%), use of bait (81.67% and 63.33%), treating seeds with boric powder (76.67% and 76.67%), use of readymade baits or tablets (75.00% and 63.33%), fumigation during storage by EDB ampoules (70.00% and 60.00%), respectively. Most of the post harvest management methods have been practiced traditionally. Hence, farmers know about them, however, some of the practices like use of fumigation and baits were also known to the respondents. These topics might have covered during the training conducted by CIDA project.

The data made it clear that indigenous method to check storage insect is known by less than 50.00 per cent of the respondents adopting improved and traditional method of storage. This reveals that traditional practices have not been transferred to next generation, which might be due to lack of interest and belief. Use of indigenous methods requires collection of particular plant materials like neem, *Bhaje beru* (*Acorus calamus*) etc. which the present generation is reluctant to do. There is need to include these topics in

regulation trainings of crop production by development departments. As farmers do not have separate room for storage, fumigation is not an effective method, hence there is need to make efforts to reinforce farmers to make use of traditional methods. Similar observations were made with respect to rodent management, where more number of respondents know about tablets/baits and rat traps and less per cent of respondents had knowledge about simple low cost methods.

Further, it was observed that management practices which can be performed manually were adopted by majority of the respondents (70% -100%), as they do not require any additional costs. The above findings are in line with the observations of Darbha *et al.* (1997), who reported that cent per cent of the respondents had adopted the practice of drying of food grains before storage.

Over fifty per cent of the respondents had adopted practices like fumigation by using EDB ampoules and use of neem leaves. The findings of the study are partially in line with Basavaprabhu and Neetu (2007), who has reported that regarding protection from insect pest and rodent, addition of dry neem leaves and its powder to bags or storage container is followed by 86 per cent of the farmers. The results are also in confirmation with findings of Bhople and Sudha (2000), who found that majority of farm women respondents (56%) used neem (*Azadirachta indica*) leaves while storing food grains for checking of damage due to insects. Costs of these methods are within the reach of farmers and farmers are in the habit of using neem leaves to preserve the seeds in the good condition, some time they extend the same practices to store food grains in small quantities. Very few (10% - 30%) respondents had adopted indigenous measures to control insects and rats such as, use of other botanicals, mixing ash with seeds, cat rearing and use of rat traps. The results are partially in agreement with finding of Abhya *et al.* (2007), who observed that use of ash of dried cow dung and oil were the grain storage practices prevailing in tribal areas. In view of availability of improved methods and greater awareness among the farmers, they might have switched over to improved methods i.e. use of chemicals.

Majority of the farmers adopting traditional method had not adopted most of the management practices for control of rats and insects compared to farmers adopting improved method. Because of lack of awareness, interest and exposure, they might not have adopted them.

It was observed from the Table 2 that most (46.67%) of the farmers adopting improved method were found in high knowledge category with knowledge index above 64.15 per cent, about post harvest management practices. Whereas equal per cent (26.67%) of farmers were found in low and medium knowledge index category. In case of farmers with traditional method all most equal percentage of farmers were

**Table 1: Knowledge and adoption of post harvest management practices by farmers (n=120)**

Sr. No.	Management practices	Farmers with appropriate knowledge level		Adoption					
		Improved method farmers (n <sub>1</sub> =60)	Traditional method farmers (n <sub>2</sub> =60)	Completely		Partially		Non adoption	
				Improved	Traditional	Improved	Traditional	Improved	Traditional
1.	Cleaning of seeds to separate foreign bodies	60 (100)	60 (100.00)	60 (100.00)	60 (100.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
2.	Sun drying to 10% (when seeds break with teeth)	56 (93.33)	59 (98.33)	31 (55.36)	39 (66.10)	24 (42.86)	17 (28.81)	1 (1.79)	3 (5.08)
3.	Malathion/Dichlorvas spray/dust to gunny bags/storage place	36 (60.00)	31 (51.67)	19 (45.24)	11 (35.48)	8 (19.05)	12 (38.71)	15 (26.79)	8 (25.81)
4.	Use of wooden planks/ board/ mats/plastic sheet/straw to keep gunny bags	60 (100.00)	60 (100.00)	53 (88.33)	42 (70.00)	3 (5.00)	9 (15.00)	4 (7.14)	9 (15.00)
5.	Keeping bags in well ventilated place	57 (95.00)	54 (90.00)	24 (42.11)	21 (38.89)	27 (47.37)	25 (46.30)	6 (10.71)	8 (14.81)
6.	Making airtight by smearing soil or cow dung	37 (61.67)	10 (16.67)	11 (29.73)	0 (0.00)	17 (45.95)	0 (0.00)	9 (16.07)	10 (100.00)
7.	Fumigation during storage by EDB ampoules	42 (70.00)	36 (60.00)	25 (59.52)	17 (47.22)	5 (11.90)	3 (8.33)	12 (21.43)	16 (44.44)
8.	Fumigation by using aluminium phosphide tablets	54 (90.00)	49 (81.67)	40 (74.07)	22 (44.90)	10 (18.52)	12 (24.49)	4 (7.14)	15 (30.61)
9.	Treating seeds with boric powder	46 (76.67)	46 (76.67)	17 (36.96)	9 (19.57)	11 (23.91)	14 (30.43)	18 (32.14)	23 (50.00)
10.	Indigenous methods:								
	Oil smearing to seeds	1 (1.67)	2 (3.33)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	1 (1.79)	2 (100.00)
	Mixing seeds with inert material	29 (48.33)	21 (35.00)	4 (13.79)	3 (14.29)	16 (55.17)	9 (42.86)	9 (16.07)	9 (42.86)
	Use of neem leaves/ <i>vitex negunda</i>	59 (98.33)	58 (96.67)	33 (55.93)	25 (43.10)	17 (28.81)	20 (34.48)	9 (16.07)	13 (22.41)
	Use of Bhaje ( <i>Acorus calamus</i> )rhizomes	10 (16.67)	10 (16.67)	3 (30.00)	1 (10.00)	2 (20.00)	0 (0.00)	5 (8.93)	9 (90.00)
	Mixing of ash with seeds	24 (40.00)	31 (51.67)	4 (16.67)	3 (9.68)	5 (20.83)	6 (19.35)	15 (26.79)	22 (70.97)
	Others: use of chilli powder, Bengal gram leaves, mixing with little millet seeds	14 (23.33)	10 (16.67)	0 (0.00)	0 (0.00)	14(100.00)	7 (70.00)	0 (0.00)	3 (30.00)
11.	Rodent management:								
	Bait preparation	16 (26.67)	18 (30.00)	8 (50.00)	8 (44.44)	2 (12.50)	4 (22.22)	6 (10.71)	6 (33.33)
	Readymade baits/tablets	45 (75.00)	38 (63.33)	34 (75.56)	20 (52.63)	6 (13.33)	6 (15.79)	5 (8.93)	12 (31.58)
	Bait use(prepared/readymade)	49 (81.67)	38 (63.33)	40 (81.63)	26 (68.42)	5 (10.20)	2 (5.26)	4 (7.14)	10 (26.32)
	Use of botanicals (glyrecidia, calotropis, jatrophha)	7 (11.67)	10 (16.67)	2 (28.57)	1 (10.00)	0 (0.00)	2 (20.00)	5 (8.93)	7 (70.00)
	Cat rearing	53 (88.33)	59 (98.33)	8 (15.09)	17 (28.81)	5 (9.43)	6 (10.17)	40 (71.43)	36 (61.02)
	Plugging rat holes and keeping baits	11 (18.33)	13 (21.67)	1 (9.09)	2 (15.38)	3 (27.27)	1 (7.69)	7 (12.50)	10 (76.92)
	Use of rat traps	54 (90.00)	58 (96.67)	13 (24.07)	17 (29.31)	9 (16.67)	7 (12.07)	32 (57.14)	34 (58.62)
	Others: making rat projection	2 (3.33)	1 (1.67)	1 (50.00)	1 (100.00)	1 (50.00)	0 (0.00)	0 (0.00)	0 (0.00)

**Table 2 : Distribution of respondents according to their knowledge level about post harvest management practices of food grains (n=120)**

Knowledge index	Farmers adopting improved method (n <sub>1</sub> =60)		Farmers adopting traditional method (n <sub>2</sub> =60)	
	Frequency	Percentage	Frequency	Percentage
Low (<55.85%)	16	26.67	17	28.33
Medium (55.85%-64.15%)	16	26.67	21	35.00
High (>64.15%)	28	46.67	22	36.67
Farmers adopting improved method	- Mean	: 60.00	S.D:	9.76
Farmers adopting traditional method	- Mean	: 55.94	S.D:	10.69

Adoption index	Farmers adopting improved method (n <sub>1</sub> =60)		Farmers adopting traditional method (n <sub>2</sub> =60)	
	Frequency	Percentage	Frequency	Percentage
Low (<42.34%)	18	30.00	18	30.00
Medium (42.34%-48.34%)	22	36.67	25	41.67
High (>48.34%)	20	33.33	17	28.33
Farmers adopting improved method	- Mean : 45.34	S.D: 7.06		
Farmers adopting traditional method	- Mean : 39.20	S.D: 8.36		

found in high (36.67) and medium (35.00%) knowledge index category. About 28.33 per cent farmers were found in low knowledge index category. In both the methods of storage slightly higher per cent of farmers were noticed in high level of knowledge index category.

The study revealed that most of the practices of post harvest management are traditionally practiced and indigenous, hence, there is not much difference in their knowledge of farmers adopting improved and farmers adopting traditional method. The practice of storing food grains for future use is as old as human beings. Since then, people followed one or other methods to protect stored food grains from the attack of pests. However, the quantity of storage of grains by farmers has reduced significantly and traditional practices have also been diminishing over a period of time.

The results in the Table 3 indicated that slightly higher per cent of respondents were belonged to medium adoption categories. The results were in consonance with the findings of Borkar and Rasekar (1999), who found that majority of the respondents were in middle category in respect of their level of adoption. Farmers were able to understand and appreciate the importance of grain storage practices through trainings and experience for safe storage of food grains, hence, they had adopted these practices to avoid damage to food grains. Equal per cent of farmers adopting traditional method and farmers adopting improved method were noticed in low adoption index category. Some of the practices like use of botanicals, providing ventilation were not practiced by both the type of farmers due to lack of knowledge as well as interest. The limitation of space and ventilation facility

might have affected their adoption level.

### Conclusion:

The study revealed that farmers had indigenous knowledge of post harvest management practices, but some practices like use of botanicals were not used by majority of farmers. It is important to popularize both indigenous and improved methods to check storage loss of grains at farmers level.

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