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RESEARCH ARTICLE :

Constraints perceived in adoption of improved storage practices by Marwari households of Rajasthan

P.S. BAGENIA AND K.A. MEENA

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SUMMARY : The present study was conducted in the year 2011-12 with specific objectives to study the adoption of different improved storage practices of farm produce to assess the constraints perceived by the house hold in adoption of improved storage practices. For this study Bikaner district was selected purposely. Bikaner district consists of 6 Panchayat samities. Out of them 3 Panchayat samities namely, Bikaner, Durgagarh and Nokha were selected on the basis of maximum area and production under food grain crops. From these Panchayat samities nine Gram Panchayat were selected randomly. From this two villages from each Gram Panchayat were randomly selected hence 180 respondents from 18 villages constituted the sample for the study. Ex-post facto research design was used for the study propose. The study reveals that majority of the respondents were using traditional storage structures (76.12%) followed by 69.45 per cent were using prevailing practices *i.e.* mixing of ash and neem powder in store grain and 61.12 per cent households were adopting neem products to save grain in store. Whereas more than half of the households adopted scientific rodents control practices, sun drying, use of improved storage structure and care while stacking grain bags during storage. The major constraints faced by the house holds of Marwari area in adoption of stored grain practices were not having knowledge about chemicals that are used to keep farm produce free from the insect pests, fungus, bacteria and yeasts, etc., lack of information about stored grain pests and losses caused by them, lack of the knowledge about fumigation practices. Non-availability of modern storage structure at local market, non-availability of chemicals for fumigation at village level market, chemicals are harmful for health, lack of knowledge about precautionary measures to be taken during storage of farm produce in godown, not aware about care to be taken during stacking of gunny bags, lack of knowledge sanitation and maintenance godown and another constraints were also perceived by the respondents *i.e.* reluctant to leave traditional methods, non-access to mass media at village level and lack of training to farm women about improved post harvest technology. The study also highlighted, majority of the respondents expressed their views in using indigenous storage practices because no required specialized knowledge, easy and safe in use, adopted since forefather perceived no need to change, easy in availability, easily accessible and fear in use of chemicals and hazardous to health are the main reasons which are responsible to adopt indigenous storage practices in the locality in comparison to scientific storage practices.

KEY WORDS :
Storage practices, Hindrance, Fumigants, Households, Stacking, Modern storage structure

Author for correspondence :

K.A. MEENA
Krishi Vigyan Kendra, Kumher, BHARATPUR (RAJASTHAN) INDIA

See end of the article for authors' affiliations

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BACKGROUND AND OBJECTIVES

Agriculture is supposed to be a family enterprise, in which all the family members are engaged in one or the other agricultural operations. Women are performing a major role in nearly all the agricultural operations from operation of field to harvesting of crops and even in the storage of farm produce. India has been making concerted efforts in augmenting agricultural production to meet the demand of ever increasing population. The nation is losing more than 10 per cent of total produce every year after harvest and out of this 6.53 per cent loss occurred during storage (ICAR, 1996) due to improper storage practices and lack of technical know how to protect and preserve food grains. The national sample survey shows that the percentage contribution of women in agriculture is higher than men, where most of the key operations on farms are performed by female labours (Agrawal, 1987). Farmers use to save an average of 30.0 per cent of harvested produce for consumption of family, for paying wages to labours, as seed for sowing in next season etc. During storage period, for keeping the farm produce free from post harvest losses due to insect-pest, farm women are still using the traditional storage structures like sundry and earthen kothi, stacking of grain bags etc. (Singh and Singh, 2001). Usually, women are engaged in storage of farm produce. To study the adoption of different scientific storage practices of farm produce by households. Looking to the above mentioned fact the present study was carried out with the following specific objectives:-

– To study the adoption of different scientific storage practices at household.

– To assess the constraints as perceived by the households in adoption of scientific storage practices.

– To find out reasons responsible for adopting indigenous storage practices in comparison to scientific practices.

RESOURCES AND METHODS

The present investigation regarding the adoption of different scientific storage practices of farm produce and constraints perceived by the mewati house holds (farm women) in adoption of grain storage practices was conducted in Bikaner district of Rajasthan in the year 2011-12. Bikaner district consists of 6 Panchayat samities, out of them 3 Panchayat samities namely Bikaner, Dungargarh and Nokha were selected on the basis of maximum area and production under food grain crops in the district. Further three Gram Panchayats were selected from each Panchayat samiti. Thus, a total of 9 Gram Panchayat were selected randomly. From this, two villages from each Gram Panchayat were randomly selected and 10 households from each were selected by applying proportionate random sampling technique. Thus, the total sample consisted of 180 farm women as respondents. The data were collected with the help of structured interview schedule by personal interview of the respondents. Collected data were analyzed and subjected to frequency, percentage and rank correlation and then results were interpreted accordingly.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Practice wise adoption of improved storage practices of farm produce by the house holds:

The household women were asked about the adoption of different scientific storage practices and the data obtained have been presented in Table 1.

A critical examination of Table 1 reveals that the adoption of scientific storage practices by households was by and large, not encouraging. It was observed that the adoption of scientific and improved storage practices by farm women ranged between 11.11 to 76.12 per cent, whereas, majority of respondents have not adopted the scientific storage practices. The data further reveals that 76.12 per cent households were using of traditional storage structures *i.e.*, muddy and bulk heaps followed by 69.45 per cent were using prevailing practices *i.e.*, 'mixing of ash and neem powder in stored grain' and 61.12 per cent of households were adopting the use of neem products to save grain in store. Whereas, more than half of the (56.67%), households were adopting the scientific rodent control practices, sun drying (56.12%), used of improved storage structures (55.00%) *i.e.* plastic and metal bins and care while stacking of grain bags during storage period (52.78%), while less than half of the respondents (46.12%) adopted the practice like care during reusing of gunny bags for storage purpose. About one-third portion of the respondents were adopted the practices like 'precautionary measures during storage

of farm produce in storage structures/godowns and use of fumigants for control of stored grain pests use of tobacco leaves residues and use of wheat straw in *Sachharum* with Bui and Fogg structure with 34.45, 31.67, 29.45 and 27.23 per cent, respectively. However, a little portion of the respondents adopted practices *viz.*, use of modern storage structures (pusa bin), use of malathian for sanitation of store and packing materials, use of wooden crates in godown while stacking and use of rapeseed oil for doing polish on pulses grain with 18.33, 17.77, 15.56 and 12.78 per cent, respectively. A few portion of the respondents (11.11%) used fenugreek straw and onion bulbs during stacking of gunny bags when stored in godowns. The findings of the study are in line with the findings obtained by Raje *et al*. (1994); Vasava *et al.* (1996); Dabra (1997); Singh and Singh (2001); Meena and Dangi (2006); Chavda (2010) and Dafale *et al*. (2011).

Constraints perceived by households in adoption of scientific storage practices:

By considering the non-adoption of improved and scientific storage practices by majority of the households, it was thought appropriate to look into the constraints faced by them during storage of farm produce. A query was made in this regard, and the responses gathered from the respondents have been presented in Table 2.

A perusal of data in table reveals that a high majority of the respondents (86.12%) were not having knowledge about chemicals that are used to keep farm produce free from inspect pests, fungus, bacteria and yeasts etc. followed by 84.45 per cent of the respondents were ignorant about the different stored grain pests and the losses caused by them are the most important problems faced by the households of the study area and about three-fourth of them (75.00%) lacked the knowledge about fumigation practices and accorded rank I,II and III, respectively.

The table further indicates that the majority of the respondents were found under problems *viz.*, non-availability of improved storage structures at local market, non-availability of chemicals for fumigation at village level, market, chemical are harmful for health, lack of knowledge about precautionary measures to be taken during storage of farm produce in godowns and lack of knowledge about care to be taken during stacking of gunny bags were faced by 73.89, 72.33, 69.45, 65.56 and 60.56 per cent respondents and stood ranked from IVth to VIIIth, respectively, however more than half of the respondents facing the problems like lack of knowledge about sanitation and maintenance of godowns (56.67%) followed by chemicals are costly and lack of knowledge about chemicals required for rodent control (54.45 %), lack of awareness about scientific storage structure and storage practices (52.23%) and awarded ranks IXth, Xth, XI and XIIth. Less than half of the

Table 1 : Distribution of respondents according to their adoption of grain storage practices

Sr. No	Storage practice	No. of adopters	Percentage
1.	Precautionary measures during storage of farm produce in Storage structures / godowns	62	34.45
2.	Care during reusing of gunny bags for storage purpose	83	46.12
3.	Use of improved storage structures (Plastic and metal bins)	99	55.00
4.	Care while stacking of grain bags during storage	95	52.78
5.	Use of modern storage structures (Pusa bin)	33	18.33
6.	Use of melathion for sanitation of store and packing material	32	17.77
7.	Use of traditional storage structures (Muddy and bulk heaps)	137	76.12
8.	Use of rapeseed oil for doing polish on pulse grain	23	12.78
9.	Use of Prevailing practices i.e., Mixing of ash with neem powder in stored grain	125	69.45
10.	Use of fumigants for control of stored grain pests.	57	31.67
11.	Scientific Rodent control practices	102	56.67
12.	Use of neem products to save grain in store.	110	61.12
13.	Use of fenugreek straw and onion bulbs during stacking of gunny bags in godown	20	11.11
14.	Sun drying	101	56.12
15.	Use of tobacco leaves residue	53	29.45
16.	Use of wheat straw in *Sachharum* with Bui and Fogg structure	49	27.23
17.	Use of wooden crate in godowm while stacking	28	15.56

respondents reported the hindrance like reluctant to leave the traditional methods (45.00%) and non- access to mass media at village level (40.00%) and about improved practices, neighbours do not adopt (37.22%) , ignore about losses (36.12%) and lack of training to farm women about improved post harvest technology and lack of transportation facilities in remote areas were the least important barriers faced by the respondents with 30.55 and 25.0 per cent. Similar findings were also reported by Raje *et al.* (1994); Singh and Singh (2001); Tale *et al.* (2009); Dafale *et al.* (2011) and Singh *et al.* (2012).

Reason for use of indigenous storage practices:

The reasons stated by the respondents for using indigenous grain storage practices are presented in Table 3. High majority of the household respondents stated that they had used indigenous practice because of required no specialized knowledge (76.12%) followed by easy and

Table 2: Constraints perceived by the households in adoption of scientific storage practices

Sr. No.	Constraints	No. of respondents	Per cent	Rank order
1.	Lack of knowledge about precautionary measures to be taken during storage of farm produce in godowns or storage structures	118	65.56	VII
2.	Chemicals are harmful for health	125	69.45	VI
3.	Non- availability of modern storage structures at local markets	133	73.89	IV
4.	Lack of knowledge about care to be taken during stacking of gunny bags.	109	60.56	VIII
5.	Lack of knowledge about fumigation practices.	135	75.00	III
6.	Lack of knowledge about chemicals that are used to keep farm produce free from inspect pests, fungus, bacteria, yeasts etc.	155	86.12	I
7.	Lack of knowledge about sanitation and maintenance of godown	102	56.67	IX
8.	Non- availability of chemicals for fumigation at village level	130	72.23	V
9.	Lack of information about stored grain pests and losses caused by them.	152	84.45	II
10.	Lack of knowledge about chemical required for rodent's control	98	54.45	XI
11.	Reluctant to leave traditional methods	81	45.00	XIII
12.	Neighbors' do not adopt	67	37.22	XV
13.	Non-access to mass media at village level	72	40.00	XIV
14.	Lack of training to farmwomen about improved post harvest technology	55	30.55	XVII
15.	Lack of transportation facilities	45	25.00	XVIII
16.	Lack of awareness about scientific storage structure and practices	94	52.23	XII
17.	Ignore about losses	65	36.12	XVI
18.	Chemicals are costly	101	56.12	X

Table 3 : Reasons stated by respondents in use of indigenous and traditional storage practice in comparison to scientific practices by household of Marwari area

Sr. No.	Reasons	No. of respondents	Per cent	Rank order
1.	Adopted since forefather perceived no need to change	125	69.45	III
2.	Lack of finance	43	23.89	XII
3.	Easy in availability	123	68.34	IV
4.	Easy and safe in use	129	71.67	II
5.	Required no specialized knowledge	137	76.12	I
6.	Fear in use of chemical and hazardous to health	104	57.78	VI
7.	Fear in killing the rodents	97	53.89	VII
8.	Adopted due to majority of neighbours used	63	35.00	X
9.	Raw material available at local level market	95	52.78	VIII
10.	Easily accessible	107	69.44	V
11.	Non-availability of technical guidance	85	47.23	IX
12.	Lack of training institutions	47	26.12	XI

safe in use (71.67%), adopted since their forefather perceived no need to change (69.45%) and easy in availability (68.34%) on the part of farm women and stood rank II, III and IV, respectively. More than half of respondents expressed that they adopted indigenous grain storage practices because they were easily accessible, fear in use of chemicals and hazardous to health, fear in killing the rodents due to religious aspect, enough raw material available at local level market for making structures and to use are the main reasons so that majority of households were using in villages. A sizeable per cent of respondents (47.23%) also expressed that they adopted indigenous and traditional practices because non availability of technical guidance. About one-third portion of respondents indicate that they used indigenous practices due to majority of neighbours used (35.00%) however, about one-fourth of the respondents did not use chemicals for grain storage because lack of training institutions for providing skill oriented training to farm women. Only 23.89 per cent of the respondents expressed lack of finance as a reason for using indigenous grain storage practices as well as structures. In a nutshell the farm women used indigenous or traditional grain storage practices because they required no specialized knowledge, easy and safe in use and they were in use since long, easy in availability and fear in use of chemicals and killing rodents are the main reasons to prefer indigenous grain storage practices and structures over to scientific grain storage practices. The findings are corroborating the findings of Sonelal and Srivastava (1986), Vasava *et al.* (1996) and Singh and Singh (2001).

Conclusion :

It could be stated that majority of the households did not adopt the recommended scientific storage practices of farm produce. Lack of knowledge about the chemicals are used to keep practices free from insect pests, fungus, bacteria, and yeasts etc. was found to be the major constraints as reported by the majority of farm women. Unawareness about the scientific storage practices of farm produce was the main cause affecting the adoption process of these practices. This calls for the attention of the state Agriculture Department and Extension functionaries of Zila Parishad and Krishi Vigyan Kendra of the districts head quarter and other training institutions to expose and motivate the farm women about scientific storage practices. This can be achieved by providing information through organizing training programme, campaigning and discussion at grass root level and launching a campaign through displaying of the posters and news papers in TV programme the villages depicting the hazards of post harvest losses and damaged caused by stored grain pests. This will certainly motivate the farm women and other farming community to adopt the scientific storage practices in the study area.

Authors' affiliations :

P.S. BAGENIA, Department of Extension Education, College of Agriculture, BHARATPUR (RAJASTHAN) INDIA

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