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Knowledge and adoption of improved post harvest technologies of wheat by farmers

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Abstract

Wheat (*Triticum aestivum*) is a crucial cereal crop for the majority of the world's population. It is about two billion people's most important staple food (36 percent of the world population). Majority of the respondent (55.38%) had medium level of adoption of improved post-harvest technology of wheat. the respondents (54.61%) had medium knowledge level about improved post-harvest technology of wheat. knowledge of farmers about post-harvest of wheat crops the study reveals that the famers having maximum knowledge of marketing followed by Rat control, Cleaning, grading, packing, storage pest management, ground which method of drying, harvesting, threshing and storage. Future grain storage technology will also become more intelligent and environmentally friendly. Knowledge transfer and active farmer and community engagement to overcome the adoption barriers are critical, particularly in developing countries.

Keywords: Wheat, post-harvest, adoption, knowledge, famers

1. Introduction

Agriculture plays a vital role in the Indian economy as it contributes about 20.2 per cent to the total GDP and provide livelihood to 65 to 70 per cent of the total population. The sector provides employment to 58.4 per cent of country‟s workforce and is the single largest private sector occupation. Indian agriculture has registered impressive growth over last few decades. The food grain production has increased from 51 million tons in 1950-51 to 275.68 million tons during 2017-18. However, Indian agriculture is faced with a great diversity of needs, opportunities and prospects. Food demand is expected to be doubled by 2050, while production environment and natural resources are continuously shrinking and deteriorating. Inadequate attention to agriculture has led to steep rise in food prices and increased food riots. Food crisis has aggravated further because of climate change and diversion of arable lands to urbanization, industrialization and also for producing bio-fuel. The challenge to agriculture in coming years is immense (ICAR Vision, 2030).

1.1 Post-Harvest Technologies for Wheat Used by Farmers

The post-harvest losses were found to be increased with an increase in area under crop and time of storage, while they decreased with improvement in type of storage and method of storage the post-harvest losses at farm level were estimated to be 3.28 kg/qt for wheat crop. The post-harvest losses were found to be maximum in wheat (17.81%) as compared to rice, millet, sorghum, maize, pigeon pea, gram, pea, lentil, black gram, green gram, mustard, toria (lahi), groundnut and sesame etc (Nath *et al.*, 2024) [4].

Reducing wheat losses, maintaining quality, and increasing farmer profitability all depend on post-harvest technologies. Harvesting, drying, cleaning, storing, and processing are only a few of the phases covered by these technologies.

1.2 Post-Harvest Technologies for Wheat

a. Harvesting Technologies

- **Combine Harvesters:** Machines that simultaneously harvest, thresh, and clean the grain.
- **Threshers:** Standalone equipment used for threshing wheat after manual harvesting.
- **Manual Tools:** Traditional sickles and scythes, though labor-intensive, are still widely used by small-scale farmers.

b. Drying Techniques

- **Natural Sun Drying:** Traditional method; however, it depends on weather conditions and is prone to contamination.
- **Mechanical Dryers:** Technologies like batch dryers or continuous flow dryers ensure controlled moisture removal.
- **Aeration Systems:** Used in storage facilities to maintain proper moisture levels in bulk grain.

c. Cleaning and Grading

- **Cleaning Machines:** Remove impurities like chaff, stones, and dirt to improve market value.
- **Grading Equipment:** Classify grains based on size and

quality, ensuring uniformity for better pricing.

d. Storage Technologies

- **Hermetic Storage Bags:** Airtight bags that prevent pest infestation and moisture entry.
- **Metal Silos:** Durable and pest-resistant, suitable for both small and large-scale farmers.
- **Warehouse Storage:** Centralized storage facilities equipped with temperature and humidity controls.
- **Traditional Storage:** Mud silos, granaries, and jute bags, though less effective in reducing losses.

e. Processing Technologies

1. **Milling Machines:** For grinding wheat into flour or other processed forms.
2. **Packaging Equipment:** Ensures proper packing to retain quality during transportation and storage.

f. Value-Addition Technologies

Equipment for producing wheat-based products like noodles, biscuits, and bakery items, allowing farmers to capture higher market value.

2. Material and Methods

District Sikar is located in the east central part of the Rajasthan state at 27˚21' North latitude and 28˚12‟ East longitude, with the tropic of cancer passing through southernmost tip of the state. District comprises of 9 blocks *viz*. Danta Ramgarh, Dhod, Fatehpur, Khandela, Lachhmangarh, Neem ka thana, Sikar, Ramgarh Shekhawati and Sri Madhopur. Out of which one block i.e. Dhod was selected because it has highest production of wheat in the district. Dhod block comprises of 203 villages, out of which 4 villages *viz*. Chelasi, Shyampura, Tajsarkarnawatan and Tajsarkhejdolian were selected purposively on basis of maximum area and production under wheat crops**.** From each selected villages approximately 25 percent of the respondents were selected by applying proportionate random sampling method. Thus, a total of 130 respondents constituted the sample of the study**.**

3. Processing and statistical analysis data

Data collected were qualitative as well as quantitative. The quantitative data were interpreted in terms of percentage and qualitative data were tabulated on the basis of approved categorization method as described earlier. Frequency, Percentage, Mean and Correlation Coefficient statistical techniques were used in the study.

Objectives

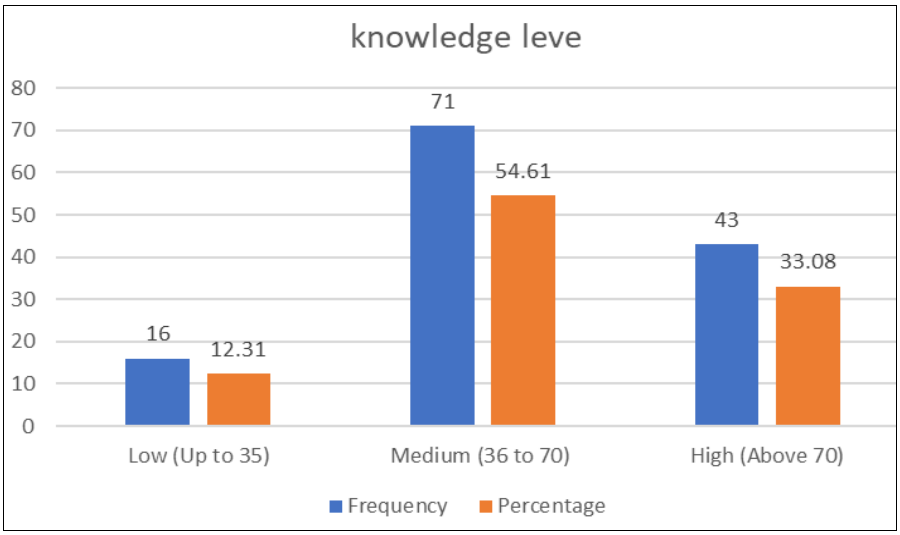
1. Knowledge of improved post-harvest technologies of wheat by the farmers.
2. Adoption of improved post-harvest technologies of wheat by the farmers.
3. The relationship between independent variables and extent of adoption of improved post-harvest technologies of wheat by the farmers.

4. Results and Discussion

4.1 Knowledge of improved post-harvest technologies of wheat by the farmers

Table 1: Distribution of the respondent according to knowledge level to improved post-harvest technologies of wheat

S. No.	Categories (Use of the score)	Frequency	Percentage
1	Low (Up to 35)	16	12.31
2	Medium (36 to 70)	71	54.61
3	High (Above 70)	43	33.08
Total		130	100.00



4.1.1 Knowledge of improved post-harvest technologies of wheat

The study reveals that out of total respondents, 54.61 per cent of respondents had medium knowledge level of improved post-harvest technologies of wheat. Because young and middle-aged farmers have knowledge of various advanced technologies such as new available variety, packages of practices, packaging, processing various latest technologies and various post-harvest equipments. The information to prevent the effects of various insects is kept in the method so that the wheat does not spoil quickly. This finding is supported by the finding of Azad *et al.*, 2014 [1].

4.1.2 Overall, Knowledge level of farmers about post-harvest of wheat crop

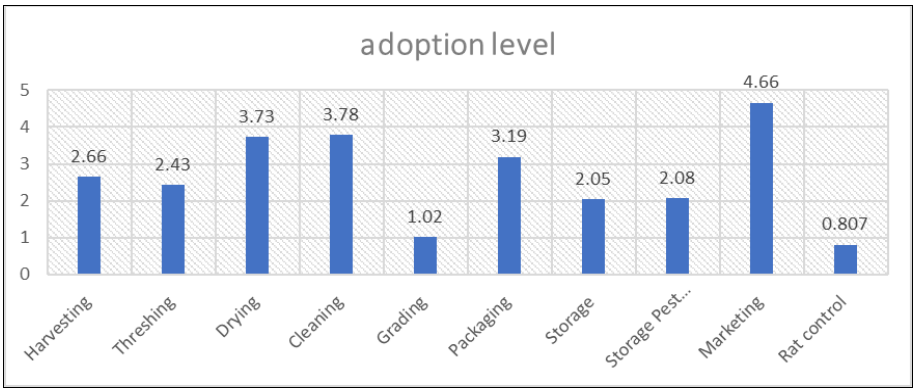
In context to overall knowledge of farmers about post-

harvest technologies of wheat crop, the study reveals that the famers having maximum knowledge of marketing followed by rat control, cleaning, grading, packing, storage pest management, method of drying, harvesting, threshing and storage. This finding is supported by of Kothari *et al*., 2010 [3].

4.2 Adoption of improved post-harvest technologies of wheat by the farmers

Table 2: Adoption Level of improved post-harvest technologies of wheat

S. No.	Categories	Mean	Rank
1	Harvesting	2.66	V
2	Threshing	2.43	VI
3	Drying	3.73	III
4	Cleaning	3.78	II
5	Grading	1.02	IX
6	Packaging	3.19	IV
7	Storage	2.05	VIII
8	Storage Pest Management	2.08	VII
9	Marketing	4.66	I
10	Rat control	0.807	X



The table shows the mean values and rank order of improved post-harvest technologies of wheat adopted by the farmer that marketing having mean4.66, followed by cleaning (3.78), drying (3.73), packing (3.19), harvesting (2.66), threshing (2.43), storage Pest Management (2.08), storage (2.05), grading (1.02) and rat control (0,807) as per adoption level of improved post-harvest technologies of wheat This finding is supported by Patodiya (2018) [5].

4.3 The relationship between independent variables and extent of adoption of improved post-harvest technologies of wheat by the farmers

Table 3: Coefficients of correlation of characteristics of respondents with their extent of adoption

S. No.	Variables	Correlation Coefficient
	Independent Variables	
1	Age	-0.499**
2	Education	0.418**
3	Family Size	0.228**
4	Occupation	0.143799NS
5	Annual Income	0.277**
6	Land Holding	0.269**
7	Area under wheat	0.288**
8	Material Possession	0.255**
9	Mass media exposure	0.380**
10	Extension contacts	0.430**
11	Social participation	0.261**
12	Risk orientation	0.350**
13	Knowledge of improved post-harvest technologies of wheat	0.460**

** Significant at 0.01 level of probability, *Significant at 0.05 level of probability, NS-Non significant

The data presented in table revel that the education (0.418**), family Size (0.228**), annual Income (0.277**), land Holding (0.269**), area under wheat crop (0.288**), material Possession (0.255**), mass media exposure (0.380**), extension contact (0.430**), social participation (0.261**), risk orientation (0.350**), knowledge of improved post-harvest technologies of wheat (0.460**), found have positive significant correlation with adoption of improved post-harvest technologies of wheat. While Occupation (0.143799NS) was found to be positive and

non-significantly correlated with extent of adopation of improved post-harvest technologies of wheat of the farmers. However, age (-0.499**) had negative and significant correlation with extent of adoption improved post-harvest technologies of wheat of by the farmers.

Knowledge of improved post-harvest technologies of wheat of farmers had shown positive and significant relationship with the extent of adoption of improved post-harvest technologies of wheat the work of Azad *et al.* (2014) [1], is in line with the study.

5. Conclusion

To reduce post-harvest losses, farm families must be educated on scientific grain storage methods that will allow them to make the best use of available produce in terms of quality and quantity. Knowledge of improved post-harvest technologies of wheat of farmers had shown positive and significant relationship with the extent of adoption of improved post-harvest technologies of wheat. Majority of the respondent (55.38%) had medium level of adoption of improved post-harvest technology of wheat. Adoption of famers about post-harvest of wheat crop the study reveals that farmer having maximum knowledge about the Marketing followed by Cleaning, drying, packing, harvesting, threshing, storage pest management, storage, grading and rat control. The government should provide adequate grain storage, facilities near the village the form of warehouse or cooperative godowns in order to minimize the post-harvest losses. Additionally, grain storage technologies in the future will become eco-friendlier and more sophisticated. To remove the obstacles to adoption, especially in developing nations, knowledge sharing and proactive farmer and community involvement are essential.

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