

# Knowledge towards Agricultural Technology by Farm Women in Bhilwara Region

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## Abstract

*Agriculture is the basis of rural economy. Agriculture is prime engine of economic growth in developing countries particularly in India. In Indian agriculture, women are the epicenters around which, all our agricultural works rotate. Women play a significant and crucial role in agricultural development and allied fields, women continue to share a number of farm operations with men. Hence, the women contribute in many aspects of rural economy but we take major aspect "Agriculture Technology" in this investigation. Despite multiple roles of women in agricultural operations and allied activities, their work is generally underestimated and undervalued. The status of women in general is much lower. They have been as subordinate and supplementary earner that of their male counter parts, largely because of customary male dominance in society, inherent shyness of farm women and lack of opportunities for educations. The continuance generation of new agricultural technology and its subsequent transmission to farmers are very important requirement for agricultural development. Researchers are expected to develop superior genetic material along with other improved production techniques and turn it over to extension workers for demonstration and ultimate adoption by the farmers. Therefore, this study have been undertaken to find out the extent of the knowledge of the women in agriculture technology. Scope and coverage the present study has been restricted to Bhilwara district.*

**Keywords:** - Agriculture Technology, prime engine, farm women, knowledge, extension workers, rural economy

## I. INTRODUCTION

Agriculture is the primary occupation of 70 per cent of Indian population. After the green revolution much emphasis was given to agriculture and with the innovations and new techniques. Indian agriculture has made impressive strides in the development of new plant varieties, cultivars, hybrids and production and standardization of plant protection techniques efficient transfer of farm innovations and their practical application to farm and home situation is the key to the economic and social development of

India, where the bulk of population depend on agriculture. Extension service in India today has a network of number of large professional extension workers at National, State, District, Block and Village levels. Several programs to help the farmers to adopt the new technologies are in operation through the country. Desired effect in this direction has been achieved but to a limited extent. Technology has become an integral part of Human Resource Development. Any technology module can be effective only when it is able to create suitable behavioural changes in the individual. Such technology strategies and modules are needed in the agricultural sector and export-oriented crops in particular to enhance farm production and export and thereby improve the socio-economic conditions of the farm women.

Technological innovation has been a key element in the growth of agriculture throughout the world. Generally there is a time lag between the origins of a new idea its adoption. In fact several years may elapse before the people try a new idea after discovery, and many more years may be needed between its first trial and large-scale adoption. It is empirically proved that when an improved practice is introduced in a village its does not meet with equal acceptance by all the farmers. Some of them adopt improved practices more quickly than others.

Technologies in agriculture field today are being generated at an amazing speed and perhaps more. Technologies made in research center, crore rupees invest in new crop production technology like - new HYV variety is low susceptible to pest and disease, they increase their production and get high rate in market. Use of new improved implement was necessary to reduce workload of respondents. To meet out requirement of nutrients of the wheat/maize crops, it is necessary to apply recommended dose of manure and fertilizers at appropriate time in the field. Plant protection is an important activity for successful crop production for controlling various pests and disease. After treated her land they sure from fungus and know about land quality. Soil and seed treatment are equally important to prevent seed borne diseases, to increase germination percentage and to give a good initial growth to the crop. Irrigation facilities, weedicides and

others, reduce drudgery of center point users (farm women).

Land and soil constitute nature-gifted resources of vital importance for human sustenance. All forms of life derive their nutrition either directly from the soil or through life supporting systems controlled by the soil. The unique assemblage of soils together with water and other resources with water and other resources determines the development potential of region. To increase the yield potential on dry lands adoption of soil and water conservation technology ranks top most among the farm women.

Rural women possessed good knowledge about urea treated fodder. With regard to adoption of different most of the respondents adopted this technology to a good extent. The low productivity of livestock in the area is mainly due to non-availability of good quality of feed and fodder. Wheat straw, grasses and dry pearl millet fodder are main source of roughage for bovine and these are very low is protein content. Urea treatment of fodder was identified as an appropriate technology for solving this problem. This is very easy and feasible technology which can be acceptable even to the marginal and landless farm women.

In earlier years women practised mixed and inter-cropping. It ensured a better nutritional balance and more food security in terms of variety and quantity. Even on the small farms where land holdings per household varied between 0.2 to 1.0 hectare, farmers used to grow a significant number of crops. This system was known as baranaaja where at least 12 different crops would grow on a single farm, and women were well aware of the different production practices including seed preparation of each variety of each crop. It led to better food security, especially as the region was somewhat isolated. Given the adverse geographical condition, it was considered best to grow as many varieties as possible in order to reduce vulnerability.

The use of pesticides, all over the world has increased manifold in recent times due to the discovery new and exotic species of pests; weeds and diseases. Substantial progress has been made estimated that about 30 percent of the potential of food production is lost due to insect pest and diseases. Insecticides are being used in some form or other to destroy insect pest. The consumption rate of pesticide is increasing by 8 per cent every year.

The rural women acquire necessary skill for various agricultural operations by observing others in the field. However, over year, various new techniques have been introduced to reduce the manual labour and

to use different external inputs to enhance the productivity. There are a wide range of agricultural implements used for tilling, weeding, planting, inter-cultivation, pest-control, harvesting, threshing, cleaning, drying etc. With the introduction of any new technology it is mostly the male members who get the opportunity to undertake training and make optimum use, while the women generally have to learn from other users. In fact many societies do not consider women to have any capacity in operating machines or even motorized implements and tools. The time has now come to change this situation. Equal opportunity must be given to women to participate in training and they should be encouraged to make use of all the tools. The scientists and techniques involved in developing new techniques and tools, which can easily be operated by women.

Transfer of technology is sine quo non-for transformation of Indian agriculture to a modernized one. Participation of women in agriculture has been though recently recognized but the 'invisible workers' have yet to be involved in the process of transfer of technology. There is already a big gap between the transferable technologies and transferred to women, though being equal partner from hoe agriculture to most modernized agriculture and from seed sowing to harvesting, is particularly very insignificant. The result is that approximately half of the participants involved in the darkness of ignorance. The access of modern agricultural machinery has been denied to women because of the belief that they cannot handle modern machinery. The world of mechanization is considered the male domain in most societies. It has also been observed that besides increasing the efficiency of farm women, modernization of agriculture creates more work for them due to increased intensity of cultivation. An in-depth understanding of the process of transfer of technology and its impact on farm women will help in formulating appropriate strategy for streamlining the transformation of agriculture to a modernized one.

Even the research system in agriculture has been men oriented. No deliberate efforts have been made to generate women specific home and farm technologies to increase their efficiency and effectiveness and reduce their drudgery. Efforts have also not been directed towards making them use whatsoever relevant technologies are available. It may be argued that agricultural technologies are gender neutral. But is they/so? The answer is either yes or no. Yes, because farm men and women can use them alike. No, because while both males and females to their advantage could utilize most of the technologies, there are many operations like transplanting, weeding and storage of grain, etc. in which women actively and

predominantly participate. Appropriate technologies for those and many other such operations can improve the efficiency and productivity of women and reduce their workload and drudgery. No doubt, some efforts have been made in this direction, but a lot remains to be done. In any case, the technologies that push women out of their traditional income-earning activities should be controlled and/or alternative means of employment should be provided so as to avoid their further marginalization.

Limited efforts have been made in scientific organizations and institutions for creating appropriate technologies for women keeping in view the nature and extent of their involvement in various activities, as also giving due regard to their working culture and milieu. Technologies must be created which make the farm women task easier, more enjoyable, less burdensome, more profitable and more productive without displacing from the labour market.

Technological innovation has been a key element in the growth of agriculture throughout the world. Agricultural technology and technology transfer both terms are center point of development. Technology transfer is closely related to increasing agricultural productivity. Farm women are the grass root of agriculture but she is known about new technology and the result is in front of us that only 40 per cent farmer were adopted new technology and take benefit.

## **II. REVIEW OF LITERATURE**

Knowledge can be defined, as a body of understood information possessed by an individual. Knowledge is one of the important prerequisites or the convert and over behavior of and individual. It is assumed that if an individual has adequate knowledge. He will develop favorable attitude towards innovations.

Choudhary et al. [2000] reported that majority of the respondents (78 per cent) had medium knowledge while few respondents (9 per cent) had high and few (13 per cent) had low level knowledge about agriculture activities.

Sagwal and Milk (2001) in a study revealed that (55) per cent of the respondents were having high level of knowledge about essential production practices (EPP) and the remaining (45) per cent had medium level of knowledge regarding epps. None of the respondents were found in low level of knowledge.

Singh and Singh (2001) despite that majority the respondent i.e. (76.89 per cent) were found to have fair and good knowledge about improved wheat cultivation technology.

Rathore and Kalla (2002) reported that out of 120 respondent 83. (69.17) Had medium knowledge. While only 17(14.17) were placed under low knowledge group and rest of the respondent (16.66 per cent) belonged to high knowledge group about improved production technology of pumpkin.

Shrivastava et al. (2002) revealed that majority of the chilly growers were having overall medium level of knowledge regarding S 49 chilly cultivation technology. In case of practice wise level of knowledge nearly 14 to 24 per cent of the chili growers had high level of knowledge while 14 to 22 present respondent had poor knowledge regarding different agronomic practices of chili cultivation like preparation at land, improved variety of seed, seed rate, seed treatment, time of raising of seeding, time of transplanting, the seedling, spacing, farmyard manure, chemical fertilizers, irrigation and plant protection measures.

Arneja and Khangura (2003) in a study found that the respondents were having high level of knowledge about the type of soil suitable for pea growing, importance of irrigation at the time of flowering, number of hoeing recommended before sowing and phosphorous fertilizer application. However, the majority of pea growers possessed poor knowledge regarding application of farmyard manure, plant to plant spacing, insecticide and application, treatment of pea seeds with rhizobium culture, recommended time of first plant irrigation and seed rate recommendation for pea crop.

Meena (2003) found that majority of the respondents 74(61.67 per cent) had medium level of knowledge regarding improved practices of guava cultivation whereas, number of respondent found in low and high knowledge category were 24(20.00) and 22 (18.33 per cent), respectively.

## **III. RESEARCH METHODOLOGY**

State Rajasthan, District Bhilwara, 5 Panchayat Samities, two village from each PS and 30 women from each village was purposely selected for the purpose of measure the knowledge among farm women towards agriculture technology. Hindi language use for preparation of survey schedules and local dialect was used for Personal interview.

### **A. Techniques Of Analysis**

After collecting data it is necessary to analyze them with the help of statistic to arrive at proper and adequate conclusion. The data were processed; tabulated and analyzed using frequency and percentage.

**B. Objective Of The Study**

- To find out the knowledge of farm women towards Agriculture technology.

**C. Measurement The Knowledge Of Selected Farm Women About Agricultural Technology**

Women are the backbone to the farming system of the villages as they have intrinsic knowledge different farming activities viz., how to make seeds and how to preserve them, how to prepare manure, how/when to sow seeds of different varieties and different crops, qualities of different crop varieties, how to get intra and inter village co-operation and how/when to harvest different crops. It is clear that while men mostly know about cash crops and new seeds, women are a reservoir of traditional knowledge system of not only farming but also forestry and animal husbandry, despite the highly skewed division of labour and decision making. This knowledge has so far provided good food security and ecologically sustainable farming.

The maximum obtainable score for the knowledge test was 40, which was further divided into different components and questions within the components on the basis of importance of respective component as well as the question as viewed by judges. The components with the maximum obtainable scores are given in table 1.

**Table 1 Component-wise distribution of scores for knowledge measurement**

S.No.	Components	Score
1	Improved seed, seed rate and seed treatment	7
2	Soil treatment	3
3	Inter cropping	2
4	Manure and fertilizer	5
5	Chemical weed control	2
6	Plant protection	11
7	Irrigation management	3
8	Improved agriculture implements	2
9	Harvesting and storage	3
<b>Total Score</b>		<b>40</b>

The total scores obtained by the respondents in different components were converted into MPS for ease of comparison. On the basis of MPS, the respondents were distributed in three knowledge categories, which were formulated by dividing total scores of 40 into three equal class intervals.

**Table 2 Distributions of respondents by their overall knowledge**

S.No.	Knowledge category	Score range
1	Poor	Less than 14

2	Average	14 - 28
3	Good	Above 28

**D. Analysis The Knowledge Of Selected Farm Women About Agriculture Activities**

Knowledge is the most important component of behaviors and it plays a major role in the covert and overt behaviors' of human beings. The quality and adequacy of performing any tasks depended upon the level of knowledge of an individual. Once knowledge is acquired, it helps to develop favorable attitude to take certain action in accepting an innovation. Nine components have been identified and knowledge of the respondents was judged in light of these.

Knowledge of the Selected Farm Women (respondents) about Improved Cultivation Practices

The results pertaining to this have been presented as under-

**1) Overall Knowledge of Selected Farm Women**

To know level of knowledge of the respondents about cultivation practices, they were grouped into three categories of knowledge namely poor, average and good on the basis of mean percent scores.

**Table 3 Distribution of selected farm women (respondents) by their overall knowledge about cultivation practices**

S.No.	Category	Percentage
1	Poor	31.82
2	Average	42.75
3	Good	25.43
Mean percent scores of Knowledge =		45.84

Perusal of the table reveals that the farm women have average knowledge of improved cultivation practices as overall MPS of knowledge has been found to be 45.83. Distribution of the respondents in different categories of knowledge highlight that majority of them 43.00 per cent were in category of average knowledge whereas, only 25.00 per cent respondent belonged to good knowledge category and 32.00 per cent fell in poor knowledge category.

**2) Component- Wise Knowledge of Selected Farm Women**

Critical examination of the knowledge score highlights that the respondents have very good knowledge about the inter cropping aspect however, respondents scored low in the component plant protection measure 16.5 per cent, followed by soil treatment 29.06 per cent and weed control 2.1 per cent. In depth enquiry into knowledge of the respondents in different components of cultivation was



made to find out specific deficiencies in the knowledge and to identify important need items for education and training.

**Table 4 Component- wise knowledge of the selected farm women (respondents) about improved cultivation practices**

S.No.	Components	Mean per cent scores
1	Improved seed, seed rate and seed treatment	39.44
2	Soil treatment	29.06
3	Inter cropping	29.70
4	Manure and fertilizer	51.33
5	Chemical weed control	02.00
6	Plant protection	15.50
7	Irrigation	87.83
8	Improved agriculture implement	48.67
9	Harvesting and storage	47.33
	<b>Average Mean per cent score</b>	<b>45.84</b>

**3) Improved seed, Seed rate and Seed treatment**

The productivity of any crop can be increased upto reasonable level by adoption of improved agronomical practices. In spite of all the efforts, if due attention is not given at the initial stage of selection of seed, seed rate and seed treatment, then the expected results in terms of desired productivity can not be achieved. Hence, the women should have knowledge regarding these aspects.

When knowledge of the respondents was judged in detail about various aspects of improved seed, seed rate and seed treatment. It was found that majority of the respondent about 63 per cent had no knowledge about seed treatment before sowing the seed in the field, it should be pretreated in order to ensure good germination problem and to avoid emergence of soil borne diseases, this fact was know to 27 per cent respondents. However, none of them knew about the name and dose of chemicals used for seed treatment as well as method of seed treatment. On enquiry from the women, it was reported that they did not follow the practice of seed treatment.

**Table 5 Distribution of respondents by their knowledge about improved seed, seed rate and seed treatment**

S.No.	Item	Percentage
1	Improved seed	97.66
2	Seed rate	94.33
3	Seed treatment	37.34

In seed rate of wheat 40-60 kg is higher recommended for maintaining the required plant population. As shown in table correct 94.33 per cent

respondents knew seed rate. 69 percent respondents knew that timely sowing of the crop result in more yields, good crop growth and less insect and pests attack.

**4) Soil Treatment**

For successful production the type of soil and preparation of land is very important as it leads to proper tilth of the soil. It is also important that land is prepared timely. Therefore, farm women should have knowledge about soil treatment with regard to soil borne diseases.

**Table 6 Distribution of respondents by their knowledge about soil treatment**

S.No.	Item	Percentage
1	Take the sample of soil	7.33
2	Name and quantity of fungicides	49.00
3	Treatment of unutilized land	61.00

Despite that majority of the respondents 61 per cent knew about treatment of unutilized land. It was found that the 49 per cent respondents knew the name and apply quantity of fungicides. This might be due to their experience of working in the field with the male member with regard to take sample of soil only 7.33 per cent respondents know its methods also.

**5) Inter-cropping**

Data presented in the table 7 indicate that 99 per cent respondents knew about inter cropping. They knew very well what were growing with crop.

**Table 7 Distribution of respondents by their knowledge about inter- cropping**

S.No.	Item	Percentage
1	Inter-cropping	99.00

**6) Manure and Fertilizer Application**

To meet out requirement of nutrients of the wheat crops, it is necessary to apply recommended dose of manure and fertilizers at appropriate time in the field.

Data presented in the table 8 indicate that 96 per cent knew about the name of different manure and fertilizers viz. Farm yard manure, nitrogen, potassium and phosphorus. Similarly, they also have knowledge about advantages of application of manure and fertilizers in the crops. It was found that though majority of the respondents 94 per cent were involved in the activity application of manure and fertilizers in the field. However, they had poor knowledge about 56 per cent regarding recommended dose of these in the crop. This might be due to the reason that the women were mechanically involved in the activity and the decision regarding quantity of manure and fertilizers to

be applied in the crops was generally taken by the male members.

Similarly the respondents also have poor knowledge about method of application of manure and fertilizers in the crops. The possible reasons for this might be that most of them are following the traditional method of manure and fertilizers application i. e. broadcasting and hence are unaware about the correct method.

**Table 8 Distribution of respondents by their knowledge about manure and fertilizers application**

S.No.	Item	Percentage
1	Manure and fertilizers application	94.00

Plant protection measure and improved implements

Plant protection is an important activity for successful crop production for controlling various pests and disease suitable.

**Table 9 Distribution of respondents by their knowledge regarding plant protection measure and improved implements**

S.No.	Item	Percentage
1	<b>Plant protection measure</b>	
	(i) Name and dose of insect-pests	34.66
	(ii) Name of plant disease and dose of chemicals used for control of disease	26.66
2	<b>Improved implements</b>	
	(i) Name of agriculture implements and their utilization	77.67
	(ii) Types of irrigation	79.33

Pesticide and fungicides have to be sprayed at number of times. Therefore, the growers should have sufficient knowledge about control measures of pests and diseases. Table depicts that the respondents have poor knowledge in all the aspects of plant protection measures. When the respondents were asked about the name of common insect-pests and diseases of wheat, only 34.66 per cent respondents could tell the local name, which were verified by the scientist and found that their knowledge about the aspects was correct.

It was further found that majority of the respondents 95 per cents were totally unaware about the name and dose of insecticides-pesticides as only 5-8 per cent respondents could tell the correct name and dose of the chemicals.

**7) Improved Implements**

Regarding improved implement was necessary to reduce workload of respondents, 77.67 per cent respondents know about name and utilization of agriculture implements. All the respondents like that reduce her drudgery and will found good production.

The respondents’ knowledge about 79.33 per cent types of irrigation but they not apply new irrigation varieties on field because of costing, poor knowledge and management so they adopted only pipe irrigation.

**8) Harvesting and Storage**

Regarding harvesting of the crop, it was found that since majority of the respondents 100 per cents were involved in the activity either independently or jointly with family members, they had good knowledge about the recommended time of harvesting of wheat crop.

**Table 10 Distribution of respondents by their knowledge regarding harvesting and storage**

S.No	Items	Percentage
1	Harvesting time	100.00
2	Storage of grain	88.33
3	Save of storage grain	97.33
4	Name and quantity of fumigants	94.33
5	Name and chemical of rat controlling	33.67
6	Making of poison food for rat controlling	69.67

Perusal of table 10 reveals that the respondents had good knowledge above 88.33 per cents had knowledge about storage in iron dream. A few respondents storage grain in soil and stone dream, save of grain for damaged to use of fumigants about 97.33 per cent use it and name of salphose and 94.33 per cent respondents knew about it. Based of the finding it could be concluded that only 33.67 per cent respondents know about the name of rat controlling chemicals and 69.67 per cent respondents had poor knowledge about prepare the poisoning food for rat.

**IV. MAJOR FINDINGS**

**A. Knowledge Regarding Improved Agriculture Technology**

- (i) All the respondents had either average or poor knowledge about improved crop production technology. Majority of respondents 43.00 per cent were in category of average knowledge whereas, only 25.00 per cent respondent belonged to good knowledge category and 32.00 per cent fell in poor knowledge category. The overall MPS of knowledge was found to be 45.83
- (ii) The knowledge score in different components highlights that the respondents scored highest in component "Irrigation management" with MPS 87.33 however, in rest of the components the mean scores was less than 45 per cent. The respondents scored lowest in the components weed control 2.1 MPS, plant- protection

- measure 16.5 MPS and followed by soil treatment 29.06 MPS.
- (iii) In the component soil and field preparation, majority of the respondents 7.33 per cent knew about the type of soil and number of ploughing however, they were unaware about the name of soil borne disease and chemicals used for control of the some.
  - (iv) In case of seed and sowing 90 per cent respondents knew about improved seed and sowing 35 per cent maturity period. Advantages of HYV were known to nearly half of the respondents. Majority of them had knowledge about importance of seed treatment 37.34 per cent, seed rate 94.33 per cent and spacing for sowing 64 per cent, advantages of timely sowing 69 per cent and recommended time of sowing 77 per cent.
  - (v) Regarding manure and fertilizer application majority of the respondents knew about name 62 per cent, advantages and time of application of manure and fertilizer 69 per cent. Recommended dose and method of application of manure and fertilizer was known to only 28 – 38 per cent, respectively.
  - (vi) More than 66 per cent respondents knew about time of weeding however, none of them knew about name and dose of weedicides. Regarding irrigation, 79.33 per cent respondents knew about types of irrigation and 58 per cent knew about number of irrigation but only 16 per cent respondents knew time of irrigation.
  - (vii) In case of plant – protection measures 34.66 per cent respondents knew the name of insect-pests and diseases however, they were unaware about the name and dose of chemicals used for control of various insect-pests and diseases in the crop. More than 70 per cent respondents had correct knowledge about the time of harvesting.
  - (viii) Regarding improved implement was necessary to reduce workload of respondents, 77.67 per cent respondents know about name and utilization of agriculture implements

#### V. SUGGESTION

Based on the finding it could be concluded that respondents had poor knowledge in all the aspect of wheat cultivation viz. irrigation, manure and fertilizers, improved agriculture implements, harvesting and storage, improved seed, seed rate and seed treatment, plant protection measures and chemical weed control which needs to be emphasized in the training course meant for the women.

In this era, the farming concept has touched a new apex with mechanization, perception for precision, timeliness of operations, efficient use of inputs, and improvement in quantity of productivity, and reduction in the loss in produce, safety, comfort and drudgery. Women due to their lack of knowledge and ignorance have consistent inaccessibility to modern technology of cultivation and other facilities available to their counterparts. It was found that machines were not handled by women in any farm operation; side work, which was labour intensive, was assigned to women. There is a need to give training to women about knowledge functions and handling of various farm implements. This will make women labour force more skilled and confident and will relieve them of a drudgery they undertake.

There is a need to increase women access to knowledge regarding new technology, credit and marketing and they should come up from the world of illiteracy and backwardness. The findings of this study further, reveal that the farm women in India are eager to change equally as compared to western, but the facilities and incentives impose limitations. The main reason for their inability to adopt the new technology and not discontinuance is on account of limited possibilities. The farm women have often said that yes, they little know about the technology, they had used it and they are convinced but because of the lack of adequate finance and high cost of the input in the market forced us to take decision to leave the use of the new farm practices.

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