

KNOWLEDGE OF FARM WOMEN IN CULTIVATION AND POSTHARVEST PRACTICES OF *BER* (*Ziziphus mauritana*) IN BHARATPUR DISTRICT

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ABSTRACT

The study was conducted to assess were to study the Knowledge of farm women in cultivation and postharvest practices of *Ber* (*Ziziphus Mauritana*) in Bharatpur district (Rajasthan). The sample consisted of randomly selected 100 farm women from 10 villages of selected panchayat samities. Personal interview technique was used for collecting data from the respondents. The outcome of the study divulges that the respondents had poor knowledge (97%) about improved cultivation and post harvest practices of *Ber* with overall Mean Percent Score of 14.36. Further respondents had average knowledge about improved varieties (56.5 MPS) and intercropping (49.5 MPS). The respondents scored lowest score in propagation (6.0 MPS) followed by training and pruning (8.6 MPS), plant protection measures (2.05MPS), and manure and fertilizer application (0.35 MPS). Regarding post harvest operations, majority of the respondents had good knowledge about prevailing price of *Ber* (78%), shelf life (72%) and grading (70%). None of them had knowledge about storage of *Ber* in bulk and processing of *Ber*.

INTRODUCTION

India enjoys an enviable position in horticultural map of the world. A wide range of fruits and vegetables are grown in the country, which is a very rare situation in any other country of the world. The total production of fruits has been estimated at 43.11 million tones from 4.01 million hectare area, which makes India, the second largest producer in the world (ICAR, 2006). Our share in world production is 10 per cent in fruits. About 54.2 per cent of the world's mango, 11 per cent of world's banana and almost 90 per cent of *Ber* is produced in the country (Choudhary and Sharma, 2004). *Ber* (*Zizyphus mauritiana*) is an ancient and indigenous fruit of India, China and Malaysia region. *Ber* fruits can be within the reach of the poor people and hence known as poor man's fruit. In Rajasthan *Ber* covers an area of 3,200 hectare with an annual production of 28,800 tonnes and productivity of 9,000 kg per hectare (Anonymous, 2010). Jaipur, Alwar, Bharatpur, Jhalawar, Chittorgarh, Jalore, Kota, Dausa, Barmer, Jodhpur and Bhilwara are the major *Ber* growing pockets in Rajasthan. Nutritionally, *Ber* fruit is widely acclaimed for its rich source of ascorbic acid, cal-

cium, iron and phosphorus (ICMR, 2010). *Ber* production is highly remunerative but requires proper handling with respect to pre-harvest, harvesting and post harvest treatments like packaging, transportation, storage, processing etc. Profit could be enhanced if efforts to increase production are supplemented with efforts to minimize post harvest losses and enhance shelf life (Pareek, 2001). Rural women form the most momentous productive work force in the economy of majority of the developing nations, including India. At present in rural India, majority of the women are associated directly or indirectly with agricultural production, processing and distribution. Different operations like sowing, application of fertilizers, transplanting, protecting crop from birds, harvesting, winnowing, cleaning grain and grain storage were predominantly performed by the farm women. The condition of women is more alarming. Despite significant contribution in the production process, they are treated as consumers of social services rather than producers. They are kept away from development programmes in agriculture and allied sectors. As a result, women lag behind in learning and acquiring the new technologies and innovations.

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Due to lack of knowledge, they are still using traditional practices in fruit cultivation and post harvest operations, which adversely affects the yield. Since, women are the major contributors in the cultivation and post harvest practices of *Ber*, it is more important to equip them with scientific knowledge. Therefore, the present was undertaken with the objective to find out the knowledge of farm women regarding cultivation and post harvest practices of *Ber*.

RESEARCH METHODOLOGY

Bharatpur district consists of nine panchayat samities Out of which, two panchayat samities i.e. *Veer* and *Sevar* were selected purposely on the basis of highest production of *Ber*. For selection of sample village wise list of farm women who were involved in *Ber* cultivation were prepared. Based on random sampling, ten *Ber* growers were selected from each of selected village to constitute a sample of 100 *Ber* growers. Thus, the total sample consisted of 100 farm women from 10 villages. Interview schedule was used for collecting responses from each respondent in an informal atmosphere by personal interview method. The data collected from the respondents was scored, tabulated and analyzed by using suitable statistical tools. Finally, the appropriate inferences were drawn at each level of interventions to arrive the final results.

RESULTS AND DISCUSSION

Background information of the respondents

More than half of the respondents (60%) belonged to the age group of 30-45 years. Majority of them (66%) were from i.e. SC and OBC. Regarding education, 46 per cent respondents were unlettered and 39 per cent could read and write. Agriculture was the main occupation of all of the respondents. Nearly 50 per cent respondents had land holding above 2 hectare whereas, nearly 41 per cent had 1 -2 hectare of land holding. Only few respondents (2%) received 2-3 trainings of 3-6 days duration related to *Ber* cultivation organized by Agriculture Department, Bharatpur.

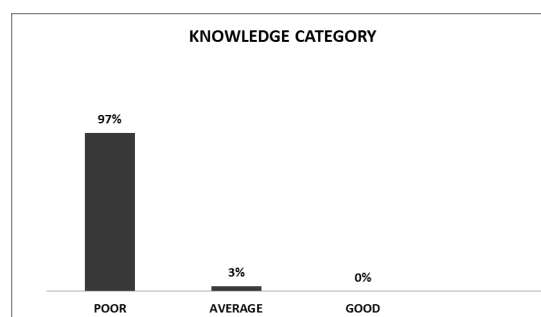
Distribution of respondents by their overall knowledge about cultivation and post harvest practices of *Ber*

MPS of knowledge : 14.36

Perusal of **Fig 1** highlights that majority of the respondents (97%) were in the category of poor knowledge where as 3 per cent respondents belonged to the average knowledge category. There was no respondent in good knowledge category. The overall MPS of knowledge was 14.36.

The findings are in line with the findings of Solanki (2001) who reported that majority of the farm women had either poor or very poor knowledge of improved horticultural practices.

Overall knowledge



Component wise Knowledge Soil and Climate Soil and climate

For flourishing fruits production, the farm women should have knowledge about type of soil, depth of soil and climate necessary for cultivating *Ber*. In depth assessment of Table 1 divulges that 40 per cent respondents knew that subtropical climate is suitable for *Ber* cultivation, whereas 60 per cent respondents did not have correct knowledge of this. More than 40 per cent respondents knew about soil depth. This was due to their intensive involvement in the activity digging of pits either independently or jointly with the male members. None of the respondents had knowledge about soil pH. Majority of the respondents (78%) knew that sandy loam soil is good for *Ber* cultivation

Table 1: Knowledge of respondents regarding soil and climate in *Ber*
n = 100

S. No.	Items	Percentage of respondents
1	Type of climate	40
2	Type of soil	78
3	Soil depth	42
4	Soil Ph	0

Improved variety

By adoption of improved horticultural practices, the productivity of any crop can be increased up to reasonable level. It was good to know that more than sixty percent of the respondents knew the name of improved variety of *Ber* viz. *Gola*, whereas they were unaware about other varieties i.e. *Sev* and *Umran*. This was due to the reason that *Gola* variety was common in the area and very few respondents were raising *Sev* and *Umran* varieties. More than 60 per cent respondents knew that the improved varieties have more yields and are resistant to insect-pest and diseases (Table 2).

Table 2: Knowledge of respondents regarding improved variety of *Ber* n = 100

S. No.	Items	Percentage of respondents
1	Name of recommended variety of <i>Ber</i>	66
2	Advantages of high yielding varieties	61

Propagation

In-depth knowledge assessment of the respondents in various aspects of propagation revealed that majority of them (94-100%) did not possess any knowledge regarding propagation of plants. This was due to the reason that majority of them were not following the practice of raising seedling in nursery and they used to buy the budded plants directly from the market. Further, none of them had undergone any training in budding. None of the respondents knew about treatment of seed before it is sown in nursery (Table 3).

Table 3: Knowledge of respondents regarding propagation n = 100

S. No.	Items	Percentage of respondents
1	Different methods of plant propagation in <i>Ber</i>	4
2	Method of budding in <i>Ber</i>	2
3	Advantages of vegetative propagation	
	Early bearing of fruits	15

	True to type of fruit	3
4	Recommended time for sowing seed in nursery	6
5	Seed treatment	0

Plantation

Data presented in Table 4 indicate that 53 per cent respondents knew about the recommended age of transplanted plants. The recommended length of transplanted plant was known to 70 per cent respondents. Similarly 62 per cent respondents had knowledge about the recommended time period for plantation of *Ber*. When the respondents were asked about the advantages of transplanted plants, 31 per cent respondent knew that timely transplanting results in decreased mortality rate.

There were 36 per cent respondents who knew about plant to plant spacing. Similarly 74 per cent respondents knew about the size of pit. This was due to the reason that the respondents were intensively involved in the activity of plantation and digging pits either independently or jointly with male members of the family.

It was further found that majority of the respondents did not know about filling of material in the pits as only 14 per cent respondents could answer correctly. This might be due to the reason that the women were just helping the male members in the activity and the decision regarding quantity of filling material to be filled in the pits was generally taken by the male members.

Table 4: Knowledge of respondents regarding plantation n = 100

S. No.	Items	Percentage of respondents
1	Recommended age of transplanted plant	53
2	Length of transplanted plant	70
3	Time of plantation	62
4	Advantages of transplanting plant	31
5	Plant to plant spacing	36
6	Size of pit	74
7	Filling material in pits (2part sand soil+2 part clay+1part FYM+50-100 methyle parathion dust)	14

Training and pruning

Training is a process by which a plant is tied and pruned to give it a proper shape or a frame work so that the plant can withstand crop load (unwanted dried or diseased part is removed) whereas, pruning is a judicious removal of leaves, shoot, branches/ roots of plants to increase its usefulness.

Perusal of Table 5 depicts that the respondents had poor knowledge about training and pruning in *Ber*. Only 12 per cent respondents knew about the requirement of training in *Ber*. Similarly, 2 per cent women possessed knowledge about recommended time for training. Similarly only 3 per cent women knew about recommended time of pruning. The poor knowledge of women regarding these aspects was due to the reason that only 20 per cent respondents were involved in training and pruning of *Ber* and it was a male dominated activity.

Table 5: Knowledge of respondents regarding training and pruning in *Ber* n = 100

S. No.	Items	Percentage of respondents
1	Advantages of training	12
2	Recommended time for training	2
3	Advantages of pruning	
	Give more yield	8
	Remove diseases and Cross branches	12
4	Recommended time of pruning	3
5	Method of pruning	4

Manure and fertilizer application

To meet out requirement of nutrients of the fruit crops, it is important to apply recommended dose of manure and fertilizer at appropriate time in the field. cursory look of Table 6 depicts that respondents had very poor knowledge regarding manure fertilizer application. Only 3 per cent respondents knew the name of urea. They also had poor knowledge regarding recommended dose of manure and fertilizer in *Ber*. The reason behind this might be that the women were just helping the male members in the activity and the decision regarding quantity of manure and

fertilizer to be applied in the field was generally taken by the male members. Similarly, the respondents also had poor knowledge about method and time of application of manure and fertilizer as only 4 per cent subjects could tell the correct time and method of application of fertilizers. The findings are in line with the findings of Goyal (2006) who found that the farm women possessed poor knowledge about fertilizer application.

Table 6: Knowledge of respondents regarding manure and fertilizer application in *Ber* n = 100

S. No.	Items	Percentage of respondent
1	Name of manure & Fertilizers	
	Farm yard manure	0
	Urea	3
	Super phosphate	0
	Murate of Potash	0
2	Recommended dose of manures fertilizers	0
3	Recommended time of application of manures fertilizers	1
4	Size of basin for applying manure & fertilizer	3

Plant protection

For controlling various insects-pest and disease, suitable insecticides and pesticides have to be applied. Therefore, the growers should have sufficient knowledge about control measures of insect-pests and diseases. Perusal of Table 7 reveals that the respondents had poor knowledge regarding plant protection aspect, as only 2-12 per cent respondents could tell the name of major insect-pest and diseases in *Ber*. This might be due to the reason that plant protection was a male dominated activity in which involvement of women was found to be minimum. In some cases where women were involved, they worked as a helper to the male members in the activities like preparing pesticide solution for spray, spraying solution in the field. Another reason for poor knowledge of the respondents might be that majority of the respondents were illiterate. It might be difficult for them to remember the technical name of the chemicals.

Table 7: Knowledge of respondents regarding plant protection measures in *Ber* n = 100

S. No.	Items	Percentage of respondents
1	Name of insect-pest and its control	
	Bark eating caterpillar	4
	Fruit fly	12
	Control measures	0
2	Name of diseases	2
	Symptoms	0
	Control measures	0

Irrigation, intercropping and harvesting

With regard to irrigation aspect, it was found that only 26 percent respondents possessed knowledge about the recommended time of irrigation. Similarly 34 percent respondents had knowledge about number of irrigations in *Ber*. The possible reason for this could be the fact that majority of women were not involved in the irrigation activity and it was mainly performed jointly with male members of the family (Table 8).

Table 8: Knowledge of respondents regarding irrigation, intercropping and harvesting in *Ber* n = 100

S. No.	Items	Percentage of respondents
	Irrigation	
1	Time of irrigation	26
2	Number of irrigation	34
	Inter cropping	
1	Recommended crops for inter cropping	39
2	Recommended time for inter cropping	60
	Harvesting	
1	Time of harvesting	93
2	Recommended stage of harvesting	98

The findings are in line with the findings of Arnya and Khargura (2003) who reported that majority of the pea grower's possessed average knowledge about recommended time for irrigation. The Table further depicts that 39 per cent respondents knew about the vegetables that could be intercropped with *Ber*. It was further found that more than 50 per cent respondents possessed knowledge about recommended time for intercropping. Regarding harvesting of the crop it was found that almost all the respondents knew about recommended time and stage for harvesting of *Gola* variety of *Ber* because they were raising this variety on their farms and were intensively involved in the activity.

Post Harvest practices

Post harvesting has acquired added important in view of improving the quality of produce and reducing post harvest losses by proper handling, packaging, storage transportation and other technologies.

Table 9 depicts that majority of the respondents (72%) had knowledge that shelf life of *Ber* is 3-4 months. Similarly respondents had knowledge that grading of *Ber* can be done on the basis of colour (57%), size (11%) and by separating rotten *Ber*(2%). It was found that none of the respondents had knowledge about storage of *Ber* in bulk. This might be due to the reason that all of them use to sell *Ber* immediately after harvesting. Regarding selling price of fruit it was found that majority of the respondents (78%) had knowledge about the prevailing price of *Ber*, similarly the respondents had knowledge about packaging of *Ber* in gunny bags (52%).

Table 9: Knowledge of respondents regarding Post harvest practices in *Ber* n = 100

S. No.	Items	Percentage of respondents
1	Shelf life of <i>Ber</i>	72
2	Grading of <i>Ber</i>	
	Basis of colour	57
	Basis of size	11
	Separating rotten <i>Ber</i>	2
3	Storage of <i>Ber</i> in bulk	0

4	Packaging of <i>Ber</i>	
	Gunny bags	52
	Basket	0
5	Products made from <i>Ber</i>	
	<i>Ber</i> squash	0
	<i>Ber</i> pickle	3
	<i>Ber</i> churan	3
	<i>Ber</i> chutney	12
	Dried <i>Ber</i>	4
	<i>Ber</i> candy	0
	<i>Ber</i> Murraba	0
6	Prevalling price of <i>Ber</i>	78
7	Method of preparing <i>Ber</i> squash	0
	<i>Ber</i> pickle	0
	<i>Ber</i> Curan	3
	<i>Ber</i> Chutney	1
	Dried <i>Ber</i>	0
	<i>Ber</i> Candy	0
	<i>Ber</i> Murabba	0
8	Considerations for increasing shelf life of processed products:	
	Select fresh fruit	38
	Use sterilized and dried containers for storage	2
9	Equipment used in processing of <i>Ber</i>	2

With respect to knowledge of the respondents about products made from *Ber*, it was found that none of the respondents knew about *Ber* churan, *Ber* squash, *Ber* cutney, *Ber* candy and *Ber* murraba. This was due to the reason that these products were not popular in the area. The table further depicts that 38 per cent respondents knew that fresh fruits should be selected to increase the shelf life of processed *Ber* products. Other consideration viz., use of sterilized and dried containers for storage was not known to majority of the respondents (98%). Regarding knowledge about equipment used in processing of *Ber*, it was found that none of the respondents knew about various equipment i.e. *Ber* pulp extractor, solar drier and *Ber* processor.

CONCLUSION

The results clearly reveal that the respondents possessed poor knowledge regarding improved cultivation and post harvest practices of *Ber*. The possible reason regarding poor knowledge of women might be due to lack of exposure to different information sources. Hence, there is a compelling need to educate women regarding improved cultivation and post-harvest practices of *Ber*. It is utmost important to educate and trained the farm women regarding improved practices of *Ber* cultivation and post harvest practices, so that the existing technological gap could be minimized. Similarly, there is a need to motivate women for processing of *Ber* at commercial level so that they can get good economic return. For exposure of farm women to new agricultural technologies, regular visits of farm women should be organized at Krishi Vigyan Kendras, Agricultural Technological Information Centers, successful her orchards.

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