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RESEARCH ARTICLE

Extent of Adoption Regarding Onion Production Technology in Rajasthan – A Comparative Study

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ABSTRACT

The present study was conducted in Sikar district of Rajasthan to assess the extent of adoption of beneficiary and non-beneficiary farmers of Front-Line Demonstrations of Onion production technology. Four panchayat samities were selected from Siakr district for the study purpose. Fifty beneficiary farmers' fields where FLDs were conducted in the years 2018-19, 2019-20 and 2020-21 and 50 non-beneficiary farmers where FLDs not conducted were selected making a total sample size of 100 respondents for the study. The data from these farmers was collected using a well-structured and pre-tested interview schedule during the year 2022-23. The findings showed that the majority of beneficiary farmers (60%) and non-beneficiary farmers (52%) had medium adoption of Onion Production Technology. Also, the number of farmers in the high adoption category was more in the case of beneficiary farmers as compared to non-beneficiary farmers. Further, it was also found that both types of respondents' beneficiary and non-beneficiary possessed maximum adoption of "Seed rate & Spacing" (81.33 MPS) and non-beneficiary possessed maximum adoption of "Time of sowing" (74.00 MPS) of Onion crop. Similarly, the least adoption of the beneficiary and non-beneficiary farmers was possessed of "Plant protection measures" (59.50 MPS and 47.00 MPS) of Onion crops respectively. There is a need to raise the adoption and awareness among non-beneficiary farmers by increasing the number of FLDs organized and involving more farmers in it. It could be concluded that more farmers should be involved in front-line demonstrations which will lead to better adoption of onion production technology.

Key words: *Adoption; Front line demonstration; Production technology,*

Onion (*Allium cepa* L.) is one of the most important commercial vegetable crops cultivated extensively in India and it belongs to the family Alliaceae. The primary centre of origin of the Onion is central Asia. Onion is one of the few versatile vegetable crops that can be kept for a fairly long time and can safely withstand the hazards of rough handling including long-distance transport. It is liked for its flavour and pungency, which is due to the presence of a volatile oil "Allyl-propyl-disulphide". It is dietary essential for human beings because of its nutritional and medicinal values, which command extensive markets. It can also be used in innumerable ways. The immature and mature bulbs are eaten raw or they may be cooked and eaten as vegetables and commonly used as condiments and spices for flavouring and enriching various cuisines. It is also used in the form of dehydrated (form of flakes, rings, kibbles and powder), freezing, canning and pickling (in vinegar or brine). Sikar district stands first rank in area of Onion under cultivation (10684 ha) in the state of Rajasthan and produces 300579 tonnes of onion as compared to another district of Sikar region. (Anonymous 2019-20). Keeping the importance of onion cultivation in the Sikar district, the FLDs on onion crops were planned with the objective to study the Extent of Adoption of Onion Production Technology between Beneficiary and Non-Beneficiary Farmers in Rajasthan. The main objective of the FLD on onion was to demonstrate newly released crop production and protection technology and its management practices on the farmer's field by the scientists themselves before taking it into the

main extension system of the State Department of Agriculture under different agro-climatic regions and on the field of farmers.

METHODOLOGY

The present study was conducted in Sikar districts of Rajasthan. Sikar district was selected purposively due to the reason that Sikar district has the highest area (10684 ha) and production (300579 t) of onion crops among all districts of Rajasthan (Anonymous 2019-20). Sikar district consists of 13 Panchayat Samitis of which Laxmangarh, Fatehpur, Khandela and Piprali Panchayat Samities were selected purposively because Front Line Demonstrations on Onion were conducted by the KVK, Fatehpur (Sikar) in these Panchayat Samities. 16, 24 and 10 farmer's fields where FLDs were conducted in the year 2018-19, 2019-20 and 2020-21, respectively was included in the study as FLDs beneficiaries. Similarly, 16 nearby village farmers were also selected randomly who had not benefited from FLDs. These farmers of the villages were named as non-beneficiary farmers. Thus, the total sample size was 100 respondents consisting of 50 beneficiaries and 50 non-beneficiary farmers. A separate interview schedule was prepared and data were collected using the personal interview method. Appropriate statistical tools were applied to interpret the results. The responses obtained from respondents were recorded on a three-point continuum namely high, medium and low extent. Mean Percent Score (MPS) was calculated to find out the priority areas of various packages of practices of onion production technology. Mean Percent Score was obtained by dividing the total score of each practice statement by the maximum score obtained under each practice and multiplying it by a hundred. The formula for the calculation MPS is given below:

$$\text{MPS} = \frac{TSOR}{Max.score\ obtained} \times 100$$

TSOR=Total score obtained by respondents

Z-test for measurment of practice-wise comparison of the extent of adoption of beneficiary and non-beneficiary farmers regarding onion production technology

RESULTS AND DISCUSSION

Extent of adoption of onion production technology by beneficiary and non - beneficiary farmers : Distribution of beneficiary and non-beneficiary farmers according to their extent of adoption was carried out with the help of Mean and Standard Deviation (S.D.). Beneficiary and non-beneficiary farmers were divided into three categories on the basis of the Mean and Standard Deviation. The data were analyzed to find out the frequency and percentage in each category. The data in Table 1 revealed that the majority of beneficiary farmers (60%) had medium adoption of Onion production technology whereas (22 %) and (18%) of farmers had high and low adoption of Onion production technology, respectively. The data in Table 1 also indicated that the majority of the non - non-beneficiary farmers (52%) had medium adoption of Onion production technology whereas (36%) and (12%) farmers had low and high adoption of Onion production technology, respectively. The findings of the study are like the findings of *Kumbhare and Singh (2011)* and *Kakkad et al. (2019).*

Practice-wise adoption of onion production technology among beneficiary and non-beneficiary farmers : The extent of adoption of beneficiary and non-beneficiary farmers with regard to Onion production technology was measured in terms of MPS. A total number of 10 practices were included to assess the extent of adoption of respondents as given in Table 2.

The data in Table 2 showed that the beneficiary farmers possessed high adoption about "Seed rate & spacing" with 81.33 MPS hence, it was ranked first. The second highest adoption of was towards "Time of sowing" with 80.00 MPS & was ranked second.

Table 1. Distribution of beneficiary and non-beneficiary farmers according to their extent of adoption of Onion Production Technology (N=100)

Extent of Adoption	Beneficiary (n_1 =50)		Extent of Adoption	Non-beneficiary (n_2 = 50)	
	No.	%		No.	%
Low (below 37.44 scores)	09	18.00	Low (below 31.91 score)	18	36.00
Medium (from 37.44 to 46.08 score)	30	37.44	Medium (from 31.91 to 41.05 score)	26	52.00
High (above 46.08 score)	11	22.00	High (above 41.05 scores)	6	12.00
Total	50	100	Total	50	100
Mean = 41.76, SD = 4.32			Mean = 36.48, SD = 4.57		

Table 2. Package of the practice-wise extent of adoption of the beneficiary and non-beneficiary farmers regarding onion production technology (N=100)

Package of Practices	Beneficiary (n_1 =50)		Non-beneficiary (n_2 = 50)	
	MPS	Rank	MPS	MPS
Field preparation	76.60	IV	69.80	V
Improved varieties	75.00	VI	71.00	III
Seed treatment	76.00	V	62.00	VIII
Time of sowing	80.00	II	74.00	I
Seed rate & spacing	81.33	I	71.67	II
Fertilizer application	71.40	VIII	62.80	VII
Irrigation management	79.75	III	70.50	IV
Weed management	63.00	IX	54.00	IX
Plant protection measures	59.50	X	47.00	X
Harvesting	73.80	VII	67.00	VI
Overall	73.64			64.98

** = Significant at 1% level, r_s= 0.89**; t = 5.4

This was followed by "Irrigation management", "Field preparation", "Seed treatment" and "Improved varieties" which were ranked third, fourth, fifth, and sixth with 79.75, 76.60, 76.00 and 75.00 MPS, respectively. The data in Table 2 further showed that practices like "Harvesting" and "Fertilizer application" were moderately known by the beneficiary farmers to the level of MPS 73.80 and 71.40. Thus, ranked seventh and eighth respectively. Further, it was found that beneficiary farmers had the least adoption towards practices of great concern like "Weed management" and "Plant protection measures" with 63.00 and 59.50 MPS and stood at ninth and tenth ranks in position, respectively.

In the case of non-beneficiary farmers, they possessed high adoption about "Time of sowing" with 74.00 MPS & were ranked first. The second highest adoption of farmers was towards "seed rate & spacing" with 71.67 MPS followed by "Improved varieties", "Irrigation management", "Field preparation" and "Harvesting" which were ranked third, fourth, fifth, and sixth with 71.00, 70.50, 69.80 and 67.00 MPS, respectively. The data in Table 2 further reflected those practices like "Fertilizer application" and "Seed treatment" were moderately known by the non - non-beneficiary farmers to the level of MPS 62.80 and 62.00. Thus, ranked, seventh and eighth, respectively. Further, it was found that non-benefitting farmers had the least adoption towards practices of great concern like "Weed management" and "Plant protection measures" with 54.00 and 47.00 MPS and stood ninth and tenth ranks, respectively. The value of calculated rank order correlation (rs) was 0.89 which is positive and significant, leading to the conclusion that there is a correlation in the extent of adoption of Onion production technology by the beneficiary and non-beneficiary farmers, though there was a difference in the magnitude of MPS of the beneficiary and non-beneficiary farmers.

The beneficiary farmers were having more adoption in comparison to non-beneficiary farmers about all the cultivation practices of Onion. This might be because the beneficiary farmers might have gained more exposure and improved their adoption and skill through training, demonstrations, and field days which encouraged them for higher adoption. The findings of the study are in line with the findings of *Kumbhare and Singh (2011)* and *Dayanand et al. (2012)*.

Package of practice-wise comparison of the extent of adoption between the beneficiary and non-beneficiary farmers of Onion production technology : The data in Table 3 showed that calculated 'Z' value was higher than the tabulated value at 5 per cent level of significance in case of Field preparation, Seed treatment, Seed rate & spacing, Fertilizer application, Irrigation management, Plant protection measures and harvesting. Whereas, in case of Weed management, the calculated 'Z' value was higher than the tabulated value at 1 per cent level of significance for the package of practices of onion production technology. This calls for the rejection of the null hypothesis and acceptance of the alternative hypothesis leading to the conclusion that there is a significant difference in the adoption of beneficiary

Table 3. Package of practice-wise comparison of the extent of adoption of beneficiary and non-beneficiary farmers regarding onion production technology (N=130)

Package of practices	Beneficiary (n_1 =65)		Non-beneficiary (n_2 = 65)		'Z' value
	Mean	S.D.	Mean	S.D.	
Field preparation	7.66	1.78	6.98	1.42	2.11*
Improved varieties	1.50	0.57	1.42	0.60	0.68
Seed treatment	1.52	0.54	1.24	0.65	2.35*
Time of sowing	1.60	0.66	1.48	0.64	0.92
Seed rate & spacing	4.88	1.34	4.30	1.51	2.03*
Fertilizer application	7.14	1.55	6.28	1.77	2.59*
Irrigation management	6.38	1.79	5.64	1.57	2.20*
Weed management	1.26	0.56	0.54	0.57	6.36**
Plant protection	2.38	1.32	1.88	1.05	2.09*
Harvesting	7.38	1.93	6.70	1.47	1.98*

*Significant at 5% level of significance,
**Significant at 1% level of significance

and non-beneficiary farmers about practices like field preparation, improved varieties, seed treatment, seed rate & spacing, fertilizer application, irrigation management, weed management, plant protection measures, harvesting. In other words, there was a significant difference between adoption of beneficiary and non-beneficiary farmers of onion production technology. While, in case of the improved varieties and time of sowing the calculated 'Z' value was lesser than the tabulated value at 5 per cent level of significance. This leads to the acceptance of the null hypothesis and rejection of the alternative hypothesis leading to the conclusion that there is no significant difference in the adoption of beneficiary and non-beneficiary farmers in the adoption of improved varieties and the Time of sowing in onion production technology. The overall calculated 'Z' value was also greater than that of its tabulated value. This indicates that there was a significant difference between the overall adoption of Onion production technology between beneficiary and non-beneficiary farmers. The results in Table 3 might conclude that the beneficiary farmers had the highest overall and practice-wise adoption of onion production technology whereas, non-beneficiary farmers were having less adoption of them. Thus, it was proved evidently that the adoption of Onion production technology was more common among beneficiary farmers compared to non-beneficiary farmers. The significant difference between beneficiary and non-beneficiary farmers about the adoption of Onion production technology in the study was not unexpected. It may be due to the fact that beneficiary farmers being in continuous touch with the K.V.K. personnel might have acquired sufficient skills pertaining to Onion production technology. Thus, they are more likely to practice the learned skills in their fields. The findings of the study are in line with the findings of *Samota et al. (2019), Goswami et al. (2022), Yadav et al. (2022)* and *Raghav et al. (2022).*

CONCLUSION

The study concluded that the majority of beneficiary farmers and non-beneficiary farmers had medium adoption of Onion Production Technology. The beneficiary farmers had the highest overall and practice-wise adoption of Onion production technology whereas, the non-beneficiary had less adoption regarding Onion production technology. According to practice-wise adoption, it was concluded that beneficiary respondents possessed maximum adoption of "seed rate & spacing" and non-beneficiary possessed maximum adoption of "time of sowing" of onion crop. Similarly, the least adoption of the beneficiary and non-beneficiary farmers was possessed of "Plant protection measures" of Onion crops. There was a significant difference observed between the extent of adoption of beneficiary and non-beneficiary farmers about all the packages of practices recommended for the study area. It shows the positive impact of FLDs on beneficiary onion-growing farmers. This might be due to the fact that beneficiary farmers might have learned about Onion production technology through training, field days, farmers' fairs, exhibitions, exposure visits/ farmers tours, and literature provided by KVK scientists under the FLD programme, non-beneficiary farmers were not benefitted through the trainings and extension activities by KVK scientists.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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