



## ON FARM TRIAL – A TECHNOLOGY TOOL TO ASSESS THE SUITABLE SPACING IN ONION TO INCREASE THE SEED YIELD AT THE FARMERS FIELD

<sup>1</sup>Sunita Kushwah, <sup>2</sup>Mahesh Kumar & <sup>3</sup>Pancham Kumar Singh

<sup>1</sup> Krishi Vigyan Kendra, Banka (Bihar)-813102

<sup>2</sup> College of Horticulture, Noorsarai, Nalanda (Bihar)

<sup>3</sup> Associate Dean cum Principal, COH, Noorsarai, Nalanda.

\*Corresponding author email: sunita17kk @rediffmail.com

### ABSTRACT

A trial was conducted with onion in Nalanda district of for seed production. Farmers were not getting adequate seed yield as well as healthy seeds. Nalanda is the 2nd largest onion seed producing district after Patna with high production and productivity. It is observed after trial, that farmers were planting onion for seed yield as per the recommended practices recorded the higher seed yield in comparison to farmer's practices. The results of the on-farm trial brings out the recommended practice 1 (treatment no. 1) is feasible and economic for the farmers and viable over the farmer's practices. Percentage increase in the average seed yield was recorded quite high (34.88%) in the low input cost, so the recommended practices-1 is suitable practice for the onion seed grower of the Nalanda district of Bihar.

**KEY WORD:** ON Farm Trial, Intra row Spacing, Seed yield, Onion.

### INTRODUCTION

Onion (*Allium cepa* L) belongs to the family alliaceae [2] is one of the most important vegetable crops grown on a large area in India for local consumption and also for export purpose. The main edible portion of onion plant is the bulb, which is a modified organ constituted by the thickened fleshy leaf sheaths and stem plate. The most important character is its flavour, which increases the flavour of the food. Besides it has preservative and medicinal values. The demand of quality bulbs as well as seeds is increasing day by day. This crop has gained the importance of cash crop.

In Bihar, Southern parts onion is grown for the seed purpose on a large scale. But onion seed grower's do not have the suitable techniques increase the seed yield of onion. The quality onion seed production is still dealt by small farmers, who have inadequate knowledge for selecting proper grade of the bulbs. The farmers of our country always use small bulbs for onion seed production. Further, mother bulb size exerts significant influence on quality onion seed production. Lack of awareness of onion seed growers in our country regarding bulb size is responsible for poor seed yield and low quality onion seed. They properly not were doing the planting of onion bulb on the suitable spacing. District Nalanda ranks 2<sup>nd</sup> position in onion production in Bihar. Total area under onion production is recorded 54.32 (.000 ha) and production 1304.15 MT (2013-14) in Bihar [7]. Due to closer planting of onion bulbs, onion seed producing farmers are facing heavy infestation of disease and insect pest in the seed crop. By conducting survey, farmer's interaction and field diagnosis, it was observed that one of the important factors for low productivity of onion seed was directly related to closer spacing, selection of inappropriate bulb size and

infestation of thrips. The optimum use of spacing or plant population has dual advantage [1]. The four consideration for the conduct of the above trials included farmer's perspective, farmer's participation, farmer's management status and suitability of site [5]. The seed yield data were collected for with the two recommended and one control plots (farmer practice). Their feasibility and economics variability were accessed the trial was also envisaged with four fundamental assumption [4].

- (a) When the technology is not acceptable for the farmer in it recommended form and needs minor modification, refinement or change.
- (b) It needs the integration of related indigenous knowledge of the farmers with the scientific recommendation in the process of refinement or modification, moreover the refinement or modification is a continuous process in the lake of available technological option specific to each microenvironments.
- (c) The collaboration of farmers who has been experimenting on their own to evolve solutions to the constraints, in their farm and of the extension system which is vital in the process of technology development.
- (d) The technology or practices generation through On Farm Trials become farmer's recommendation comprising a basket of after natures and as the most appropriate to solve problem.

Keeping the above point in view, on farm trial on onion crop were started with the objectives of showing the productive potential of the new production technologies under real farm situation over the farmers practices. However, information on these aspects for this region is

not available. It was with this objective in view that the present study was initiated.

**METHODOLOGY**

On farm trial on assessment of suitable plant to plant & row to row spacing in onion to increase the seed yield was conducted by Krishi Vigyan Kendra, Nalanda in the year 2010-11 and 2011-12 in 4 villages of two blocks. Eighteen innovative and receptive progressive farmers from both the villages were selected for conducting the trial to ensure their active participation. The demonstration of improved technology was taken in a area of 0.25-0.5 ha of each farmers. Total 4.5 ha area was covered in 2 years for demonstration of recommended improved practices of onion. The experiment was laid out with onion cultivated

variety Patna Red. Two spacing PXP=30 cm, RXR=45 cm and PXP=40 cm, RXR=45 cm were compared with farmers practice i.e. treated as a control. The result was compared with the full package of practice.

The primary data was collected from the selected onion farmers with the help of interview schedule and presented in term of percentage and qualitative data was converted in to quantitative form and expressed in term of percent increased yield was calculated by the using formula.

$$\text{Percentage increased yield} = \frac{\text{Demonstration} - \text{Farmers yield}}{\text{Farmers yield}} \times 100$$

The experiment was laid out through randomized block design.

**TABLE 1.** Difference between demonstration package and farmers practice under OFT on onion

S. No.	Particulars	Demonstration Package	Farmers practices (Local check)
1	Variety	Patna Red	Patna Red
2	Sowing method	Line sowing *RP-1 P x P, R x R=30 x 45 (cm) **RP-2 P x P, R x R=40 x 45 (cm)	Line sowing but closer spacing P x P, R x R= 25x 30 (cm)
3	Farming situation	Medium irrigated land	Medium irrigated land
4	Plant protection	Need based insecticides and fungicides spray	No spray of insecticides and fungicides
5	Fertilizers	N:P:K,100:50:50 kg/ha	N:P:K,150:80:80 kg/ha

**RESULTS & DISCUSSION**

The yield performance and cost benefit ratio of On Farm Trial due to recommended technology and farmers practice were analyzed and presents in Table-3. Out the three treatments, recommended practices i.e. Plant X Plant distance 30 cm, Row X Row = 45cm, and PXP=40cm, RXR=45 were found to be most effective to increase the seed yield of onion.

The seed yield performance of recommended practices (1) were 499.2 (kg/ha) which is almost 124.8 (kg/ha) higher than farmers practices 374.4 (kg/ha) and there was 33.33% increase in the average seed yield of onion over the control (farmers practice) for the year 2010-11 and seed yield performance of recommended practices (1) were 546.0 (kg/ha), which was almost 145.8 (kg/ha) higher than the farmers practices 400.2 (kg/ha) for the year 2011-12. In

both the years recommended practices-1 had shown the percentage increase in the yield over the farmer’s practices (control). Total seed yield can be increased if recommended spacing used<sup>[3]</sup>.

Average percentage increase in the seed yield in both the years recorded (34.88%).

Working out monetary advantage revealed that cost benefit ratio of recommended practices treatment 1 and 2 (5.24, 4.47) was higher over farmers practices (3.16). Outcome of the On Farm Trial organized clearly bring out that the adaption of recommended practices treatment (1) PXP=30 cm and RXR=45cm is feasible, economically viable and suitable to increase the seed field of onion crop. These innovation techniques showed solving the farmers problems, decision making ability and to modify their farming practices<sup>[6]</sup>.

**TABLE 2.** Increasing onion seed yield through on farm trial.

Year	Under OFT Programme		Average yield (kg / ha)			% increase in the Seed yield over farmers practices	
	Total Farmers	Total area(ha)	FP*	RP-1**	RP-2***	RP-1	RP-2
2010-11	8	2	374.4	499.2	407.7	33.33	8.89
2011-12	10	2.5	400.2	546.0	456.9	36.43	14.16

\*Farmers Practice, \*\*Recommended Practice-1, \*\*\*Recommended Practice-2  
Plant to plant and row to row distance was constant for both the years.

**TABLE 3** Performance of economic indicators in terms of net return and C:B ratio for two years (2010-11) and (2011-12)

S.N.	Treatment	Cost of cultivation (Rs)	Gross return (Rs/ha)	Net Return (Rs/ha)	C:B Ratio
1	Farmers Practices	90000	374400	284400	3.16
2	Recommended practices-1	80000	499200	419200	5.24
3	Recommended practices-2	89000	487700	398700	4.47

**CONCLUSION**

On the basis of result obtain from On Farm Trial, it is obvious that recommended practices were found more feasible, economic and superior over farmer's practices being followed. A trial of cultural aspect as regard seed yield, wider spacing was better than closer spacing i.e. farmer practices (control). It is suggested that such particular approach involving extension workers and farmers in demonstration of research emanated proven technology may go a long curtail losses account various farming situations. The selection of critical input, awareness regarding recommended cultural practices, participatory approach in planning and conducting the demonstration will definitely help the transfer of technology to the farmers.

**ACKNOWLEDGEMENT**

The authors are thankful to the Dr. A.K. Singh, Vice Chancellor, Dr. R. K. Sohane, DEE, and Dr. R. N.Singh, BAU, Sabour (Bhagalpur) for encouragement and providing facilities to conduct the demonstration. I also convey my thanks to ICAR for providing fund to conduct the OFT successfully at field. Authors also convey their acknowledgement to Sri Devendra Kumar and Sri Rajeev Ranjan (Stenographer and Programme Assistant, KVK, Banka) for helping in preparing the manuscript.

**REFERENCES**

- [1]. Gremew, A., Teshome, A., Kasaye, T. and Amenti, C. (2010). Effect of intra-row spacing on yield of three

onion (*Allium cepa* L.) varieties. *Journal of Horticulture Flora.*, **2** (1): 7-11.

- [2]. Hanelt, P. (1990). Taxonomy, Evaluation, and history in onion and allied crops, edited by Haim D. Rabinowitch and James L Brewster, **1-26**; Boca Raton, fla: CRC Press
- [3]. Kantona, R. A. L, Abbeyb, L., Hillac, R. G., Tabil, M. A. and Jane, N.D. (2003). Density affects plant development and yield of bulb onion (*Allium cepa* L.) in Northern Ghana. *Journal of Vegetable Crop Production.* **8**(2):15-25.
- [4]. Pillai, K. and Gopal Krishna. (2003). On farm testing for user Fridley imp practices. *Agriculture Extension Review.* **15**(2): 23-26
- [5]. Singh, S.P. (1999). Methodology of on farm trial treat, *Krishi Vigyan Kendra – A reality* (Edited by P. Das and B. Hansra) Division of Agriculture Extension, ICAR: 127-134.
- [6]. Ud-Deen, M. M. ( 2008). Effect of mother bulb size and planting time on growth, bulb and seed yield of onion. *Bangladesh Journal of Agricultural Research* **33**: 531-537.
- [7]. State –wise analysis of Production, Storage, Market, Arrival and Price, *Horticulture Statics Department, ICAR, 2014.* [www.http//nhm.nic.in](http://nhm.nic.in).