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Organic Onion Production in Nalanda: Using Eco-Friendly Agri. Bios Inputs

M. D. Ojha[1*], Vijay Kumar[1], Divya Tiwari[1], Vinod Kumar[1], Manish Kumar[1] and P. K. Singh[1]

[1]Nalanda College of Horticulture, Noorsarai-803113, Bihar Agricultural University, Sabour, Bhagalpur, Bihar, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Organic agriculture seeks to augment ecological process that foster plant nutrition while conserving soil and water resources. Organic systems eliminate agrichemicals and reduce other external inputs to improve the environment as well as farm economics. It is a production system which favours maximum use of organic materials like crop residues, FYM, compost, green manures, oil cakes, biodynamic preparations and bio fertilizers etc. to enhance crop production, carbon sequestration and improve soil health. Organic production system is based on specific and precise standards of production which aim to achieving agro-ecosystems which are socially and ecologically sustainable. As demand for organically grown food has been growing rapidly and significant proportion of consumers believe that organic food is qualitatively better than non organic, the present study showed not only the quality of the produce but also quantitatively higher yield that touched the world record production (660 q/ha) in Nalanda Bihar.

Keywords: organic onion, yield, organic farming, eco-friendly.

**Corresponding author: E-mail: drmdojha@gmail.com;*
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1. INTRODUCTION

Onion *(Allium cepa* L.*)* is an important vegetable crop valued for the distinctive pungent or mild flavour and for the essential ingredients of the cuisine of many regions about 4.4 million hectares of land are cultivated to onion in the world. World production of onion is estimated over the average yield is about 85.80 MT with average productivity of 19.32 tonne/ hectare [1]. According to Vavilov [2] the primary centre of origin of onion lies in Central Asia. The near East and Mediterranean are the secondary centres of origin and it was introduced in India from Palestine [3] and it belongs to family Alliaceae. Onion is a major spice in diet. It ranks as the 2nd largest producers (18.97 MT) of onion, (NHB-2017-18) in the world next only to China but the productivity of Onion in India is very low 14.21 tonne/ha. as compared to other countries. Onion production in India covers an area of 1.203 million hectares with a production of 19.401 million tonnes and productivity of 16.10 tonnes per hectare [4].

Organic agriculture seeks to augment ecological processes that foster plant nutrition while conserving soil and water resources [5]. Organic systems eliminate agrichemicals and reduce other external inputs to improve the environment as well as farm economics. It is a production system, which favours maximum use of organic materials like crop residues, FYM, compost, green manure, oil cakes, bio-fertilizers, bio-gas slurry etc. to enhance crop production and improve soil health. Organic farming leads to preservation of natural resources, causes minimal negative impact on nature and could be defined as a self-sufficient system. It fully meets the definition of sustainable agriculture, because food is produced while conserving the soil (minimum mechanical soil disturbance [no-tillage]), water, energy and biodiversity [6,7]. Organic production systems are based on specific and precise standards of production which aim at achieving agro-ecosystems which are socially and ecologically sustainable. As demand for organically grown food has been growing rapidly and significant proportion of consumers believe that organic food is qualitatively better than non-organic, a field level farmer participatory trial formulated and showed not only the quality of the produce but also produces quantitatively higher yield that touched the world record production in Nalanda, Bihar.

2. MATERIALS AND METHODS

Sohdih Village in Biharsharif Block under Nalanda District is a potential belt of vegetable production. It is adjacent to Biharsharif, the district headquarters. All the farmers in this village are engaged in vegetable production round the year as an ancestral profession. The successful farmer Mr. Rakesh Kumar took the leadership to start organic farming of vegetables under the supervision of Nalanda College of Horticulture, Noorsarai, Nalanda, and Department of Agriculture in 2010-11. He formed a group of farmers and made it registered under ATMA in the name of 'Sher-e-Bihar Sohdih Organic Vegetable Grower Krishak Hit Samuh'. The Journey started with 20 farmers and 10 ha. of land, now crossing 324 farmers and 200 ha land under organic farming. Mr. Rakesh Kumar has good learning ability and zeal for adopting innovative technology on his field. The certification of organic practices in that village is being done by ECOCERT, an international organic certifying agency. This project has already entered in the C3 stage of certification. His work has also inspired the farmers of the other parts of district as well as state. More than 300 vegetable growing farmers groups have been formed, registered with ATMA Nalanda and they are growing organic vegetables in area of around 2500 ha. No of farmers involves is more than 6000.

There is a misconception among the farmers as well as scientific community that an organic method reduces the yield. In this regard one farmer participatory experiment was planned by Nalanda College of Horticulture, Noorsarai, Nalanda and a progressive farmer on organic farming practices to study the growth, yield and quality of onion. In this study, we have applied agro-bios inputs i.e. 4.0 tonnes vermicompost /ha (3.0 tonnes as basal dose and 1.0 tonne after 20-25 days after transplanting), Bio fertilizer 100 kg/ha, Neem based pestisides 150 ml/ha and Amino acid mixture 100 ml/ha. Seeds were also treated by T*richoderma viride*. The whole experiment was carried out under the supervision of scientists from Nalanda College of Horticulture, Noorsarai, Nalanda and KVK, Harnaut. Seedlings were transplanted at spacing of 15 x 10 cm. The size of plots taken was 10.0 x 5.0 m^2.

2.1 Organic Package for Onion

Nutrient Management	Product Recommended
Stage-1	
Main field preparation	Biofertilizer + Vermicompost + *Trichodermaviridae*
Stage-2	
At the time of sowing	Seed treatment with *Trichodermaviridae* 5gm/kg of seed
Stage-3	
Germination & Vegetative Development	Liquid Biofertilizer @ 1 Ltr./acr. In the root zone
30days after germination	Granule Biofertilizer 10kg/acr. + Root growth promoter 2kg/acr. With FYM
50-60 days after germination	Liquid growth promoter 1Ltr./acr. In root zone through drenching
Stage-4	
70-80 days after germination	Bio aminomix @ 4 ml/Ltr. of water
Disease & Pest Management	
All stage disease management	*Trichoderma* @ 2 kg/acr.
Early & late Blight	Biofungicide @ 5 gm./Ltr. Of water
For other pests	Neem oil @ 4 ml/Ltr. Of water or Biopesticides 5 gm/Ltr. Of water

Source: Ojha, M. D. and Saha, Bhola Nath. 2014.[8]

3. RESULT AND DISCUSSION

The result was showed that the plant growth, bulb size (5.54 cm), bulb weight (72.65g) and onion bulb yield (660 q/ha) is significantly higher than the yield obtained by the application of chemical fertilizers. This type of finding is also reported by Prabhakar et al. [9]; Yeptha et al. [10] and Chaurasia et. al. [11]. With this finding of Nalanda onion producers, it is clearly evident that organic onion production is feasible by the different organic farming practices in scientific way to achieve maximum yield with quality as compared to chemical practices.

A view of Organic Gram-Sohdih

Field visit of Hon'ble Chief Minister, Bihar

A field view of crop cutting

Field visit of District Magistrate, Nalanda

4. CONCLUSION

The study concludes that organic onion production is feasible by the different organic farming practices in scientific way to achieve maximum yield with quality as compared to chemical practices. The findings showed that not only the quality of the produce but also quantitatively higher yield could be touched the world record production (660 q/ha) in Nalanda Bihar.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. FAOSTAT . Available: http://faostat3.fao.org/home/E, Accessed on 2 July 2015.
2. Vavilov. The origin, variation, immunity and breeding of cultivated plants. Chronica Botanica Waltham, Mass (USA); 1951.
3. Yadav PM, Rakholiya KB, Pawar DM. Evaluation of bioagents for management of the onion purple blotch and bulb yield loss assessment under field conditions. The BioScan. 2013; 8(4):1295-1298.
4. National Horticulture Board. Indian Horticulture Database. Ministry of Agriculture, Government of India; 2014. Available: www.nhb.gov.in.
5. Ojha MD, Saha B. Organic Potato in Nalanda (Bihar): Using Eco-Friendly Agri. Bios Inputs. Indian Research Journal of Extension Education. 2016;14(3):119-121.
6. Pimentel D, Hepperly P, Hanson J, et al. Environmental, energetic, and economic comparisons of organic and conventional farming systems. Bioscience. 2005;55:573-582.
7. Tsvetkov I, Atanassov A, Vlahova M, Carlier L, Christov N, Lefort F, Rakleova G. Plant organic farming research–current status and opportunities for future development. Biotechnology & Biotechnological Equipment. 2018;32(2):241-260.
8. Ojha MD, Saha Bholanath. Organic Potato in Nalanda (Bihar): Using Eco-Friendly Agri. Bios Inputs. Indian Res. J. Ext. Edu. 2014;14(3):119-121.
9. Rabhakar M, Hebbar SS, Nair AK. Effect of organic farming practices on growth, yield and quality of rose onion (Allium cepa L.). Indian Journal of Agricultural Sciences. 2012;82(6):500-503.
10. Avitoli K, Yeptha AK, Singh. Quality production of Kharif onion in response to bio-fertilizers inoculated organic manures. Indian Journal of Agricultural Science. 2012;3.
11. Chaurasia SNS, De Nirmal et. al. Influence of organic sources of nutrient on Yield performances of onion on ALR (IIVR). Approaches for sustainable development of onion and Garlic; 2003.