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## A study of integrated nutrient management on growth and yield of onion (*Allium Cepa* L.) Cv. Nasik red

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#### Abstract

The field experiment entitled “Effect of integrated nutrient management (FYM+VC+NPK) on growth and yield of onion cultivar Nasik Red was planned and conducted during Rabi season 2014-2015 at vegetable research field Department of Horticulture SHUATS, Allahabad India, with combination of different source of integrated nutrient management (FYM+VC+NPK) on growth and yield of onion. Experiment consisted of 7 treatments with 3 replications laid in RBD. The result obtained from the experiment showed that different treatment combination of integrated nutrient management significantly affected the growth and yield parameters of onion such as plant height (57.33cm), length of leaves sheath (35.23cm), number of leaves sheath / per plant (10.00), stem girth of plant (2.31cm), fresh weight of plant (137.37gm), dry weight of plant (14.37gm), fresh weight of bulb (120.39gm), dry weight of bulb (14.82gm), diameter of bulb (6.95cm), bulb yield / plot (3.10kg), and bulb yield t/ha (29.6), significantly by combination of different integrated nutrients management (FYM+VC+NPK). The maximum value of bulb yield / ha were under the treatment T<sub>5</sub> (10t ha<sup>-1</sup> Vermicompost + 75% RDF).

**Keywords:** Onion (*allium cepa*.), INM, Vermi compost, growth and yield

#### Introduction

Onion (*Allium cepa* L.) is an important bulbs vegetable crop belongs to the family Alliaceae. It is one of the most important species of the genus *Allium* onion is considered to be the second most important vegetable crop grown in the world after tomatoes. Therefore, onion is popularly referred to the ‘Queen of the kitchen’. In addition, onion is used as salad and pickle. Recently, onion is being employed by processing industry to a greater extent for preparing dehydrated onion forms like powder and flakes. In the world, India stands first in area and ranks second in production after China; the total area in India under onion during 2008-09 was 5.34 lakh ha with a production of 76.37 lakh tonne. Maharashtra, Uttar Pradesh, Orissa, Karnataka and Rajasthan are the major onion producing states in India. Bio-fertilizers are the culture of bacteria which benefit the plants by providing nitrogen used mostly to release plant nutrients available from rhizosphere and stimulate plant growth and is therefore known as biological-nitrogen fixation

#### Materials and Methods

The experiment was conducted in the Horticulture Research Farm, Department of Horticulture, Allahabad School of Agriculture, SHIATS, Allahabad (Uttar Pradesh) during Rabi session 2014-2015 in factorial RBD. Onion variety Nasik Red with three level of dose in FYM (T<sub>1</sub>- FYM 20t/ha + 100% RDF, T<sub>2</sub>- FYM 20t/ha + 75% RDF and T<sub>3</sub>- FYM 20t/ha + 50% RDF and three level of dose in Varmi Compost V<sub>1</sub>- VC 10t/ha + 100% RDF, V<sub>2</sub>-VC 10t/ha + 75% RDF and V<sub>3</sub>- VC 10t/ha + 50% RDF

#### Results and Discussion

The maximum plant height (57.33 cm) was recorded in V<sub>2</sub> (10 t/ha VC + 75% RDF) followed by treatment V<sub>1</sub> in which 10 t/ha VC +100% RDF was applied treatment T<sub>1</sub> (20 t/ha FYM + 100% RDF). There was significant difference between treatments. The maximum number of leaves per plant (10.00) were recorded V<sub>2</sub> in (10 t/ha VC + 75% RDF), was followed by treatment V<sub>1</sub> with 10 t/ha VC +100% RDF, There was significant difference between the treatments. The minimum number of leaves per plant (6.30) was recorded in treatment T<sub>0</sub> (control.). The maximum stem girth (2.31 cm) was recorded in treatment V<sub>2</sub> application (10 t/ha VC + 75% RDF), was recorded followed by treatment V<sub>1</sub> with 10 t/ha VC +100% RDF. There was no significant difference between the treatments.

The minimum stem girth was recorded (1.71 cm) in treatment T<sub>0</sub> (control.). The maximum fresh weight of plant (137.37 g) was recorded V<sub>2</sub> (10 t/ha VC + 75% RDF) followed by treatment V<sub>1</sub> with the application 10 t/ha VC +100% RDF and the treatment T<sub>1</sub> with (20 t/ha FYM + 100% RDF). There was significant difference between treatments. The minimum fresh weight of plant (80.45cm) was recorded in the treatment T<sub>0</sub> (control.). The maximum dry weight of plant (14.37g) was recorded in treatment V<sub>2</sub> (10 t/ha VC + 75% RDF), was applied followed by treatment V<sub>1</sub> with the application 10 t/ha VC +100% RDF, and then follows treatment T<sub>1</sub> with the application of (20 t/ha FYM + 100% RDF), There was significant difference between the treatments. The minimum dry weight of plant (10.21g) was recorded in treatment T<sub>0</sub> (control.). The maximum fresh weight of bulb (120.39 g) was recorded in treatment V<sub>2</sub> in which (10 t/ha VC + 75% RDF), were applied followed by treatment V<sub>1</sub> with (10 t/ha VC + 100% RDF) were statistically significant. Treatment V<sub>2</sub> was significant higher, while the Minimum fresh weight of bulb (80.17g) in treatment T<sub>0</sub> control 100% RDF (100:60:100

kg/ha NPK). The maximum dry weight of bulb (14.82 g) was recorded in treatment V<sub>2</sub> with the application of (10 t/ha VC + 75% RDF), followed by treatment V<sub>1</sub> (10 t/ha VC + 100% RDF) was applied and followed by treatment T<sub>1</sub> with 20 t/ha FYM + 100% RDF, All these treatment were statistically significant. Treatment V<sub>2</sub> showed significant of higher value.the maximum diameter of bulb (6.95cm) was recorded in treatment V<sub>2</sub> with the application of (10 t/ha VC + 75% RDF), followed by treatment V<sub>1</sub> (10 t/ha VC + 100% RDF) was applied and then followed by treatment T<sub>1</sub> (20 t/ha FYM +100% RDF) was applied, all these treatment were statistically significant. Treatment V<sub>2</sub> was significant one the showed various treatments, while the minimum diameter of bulb (5.63cm) in treatment T<sub>0</sub> control 100% RDF (100:60:100 kg/ha NPK). The maximum bulb yield (29.6t/ha) was recorded in treatments V<sub>2</sub> (10 t/ha VC + 75% RDF), followed by treatment V<sub>1</sub> (10 t/ha VC + 100% RDF) and followed by treatment T<sub>1</sub> (20 t/ha FYM +100% RDF), while the Minimum bulb yield (20.3t/ha) was recorded in treatment T<sub>0</sub> control 100% RDF (100:60:100 kg/ha NPK)

Table 1

Treatments	Plant height (cm)	Length of leaf (cm)	Number of leafs per plant	Stem girth of plant (cm)	Fresh weight of plant (g)	Dry weight of plant (g)	Fresh weight of bulb (g)	Dry weight of bulb (g)	Size of bulb (cm)	Bulb yield (tones/ha)
T <sub>0</sub> Control – 100% RDF (100:60:100 kg ha <sup>-1</sup> N:P:K)	51.17	27.47	6.30	1.71	80.45	10.21	80.17	10.33	5.63	20.3
T <sub>1</sub> 20 t ha <sup>-1</sup> FYM + 100% RDF	54.85	30.62	8.67	2.01	119.17	13.51	102.42	13.21	6.71	27.4
T <sub>2</sub> 20 t ha <sup>-1</sup> FYM + 75% RDF	54.27	30.16	8.47	1.90	111.67	13.17	91.57	11.67	6.49	27.2
T <sub>3</sub> 20 t ha <sup>-1</sup> FYM + 50% RDF	52.17	28.47	7.90	1.81	89.27	11.69	85.74	11.02	5.90	26.6
V <sub>1</sub> 10 t ha <sup>-1</sup> Vermicompost + 100% RDF	55.27	33.70	8.80	2.23	129.27	13.71	109.24	13.71	6.88	29.5
V <sub>2</sub> 10 t ha <sup>-1</sup> Vermicompost + 75% RDF	57.33	35.23	10.00	2.31	137.37	14.37	120.39	14.82	6.95	29.6
V <sub>3</sub> 10 t ha <sup>-1</sup> Vermicompost + 50% RDF	52.37	29.21	8.21	1.87	101.53	12.69	89.41	11.23	6.17	26.3
F- test	S	S	S	NS	S	S	S	S	S	S
S. Ed. (±)	1.02	0.58	0.33	1.02	1.10	0.88	1.61	1.059	0.07	0.47
C. D. (P = 0.05)	2.12	1.21	0.69	2.12	2.28	1.82	3.32	2.185	0.16	0.98

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