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## Effect of nutrient management on yield parameters in knolkhol (*Brassica oleracea* var. gongylodes)

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**ABSTRACT :** The present field experiment was carried out with Knolkhol cv. EARLY WHITE VIENNA in a Randomized Block Design with three replications at Department of Horticulture, Faculty of Agriculture, Annamalai University during 2015. The experiment comprised of 10 different combinations of five different sources of nutrients including organic, inorganic and biofertilizers. The effect of different treatments were observed and noted that plants treated with 50 per cent RDF + VC @ 5 t ha<sup>-1</sup> + biofertilizers @ 2 kg ha<sup>-1</sup> (T<sub>3</sub>) registered maximum growth parameters viz., plant height, number of leaves per plant, leaf length, leaf width, root length and number of secondary roots in knolkhol cv. EARLY WHITE VIENNA.

**KEY WORDS :** Knolkhol, Vermicompost, FYM, Biofertilizers

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**K**nokhol (*Brassica oleracea* var. gongylodes) is an important vegetable of the family Brassicaceae. The stem, which is the edible part is generally enlarged immediately above ground (Nieuwhof, 1996). It has enormous nutritional and medicinal values due to its high contents of vitamins (A, B1, B2, B5, B6 and E), minerals (Ca, Mg, Zn and Fe) and antioxidant substances which prevent the formation of cancer causing agents (Beecher, 1994). Due to such qualities, constant demand in the local and international market exists. Like many other crops, yield of knolkhol is also affected by inadequate availability of nutrients in the soil. The crop responds positively to the incorporation of manures and fertilizers. Organic manures and their role in improving soil fertility and productivity of soil have been acknowledged for generations. However, it is only during the last 10-15 years that they have been incorporated into the integrated nutrient supply system for intensive high yield of wholesome produce. The

organic manures derived from biological sources like FYM, vermicompost and oil cakes are most widely used and they are decomposed in the soil by microbes. Organic manures add nutrients to the soil thus, reducing total dependence on synthetic fertilizers, which involves greater energy and expense (Dahama, 1997).

### RESEARCH METHODS

Field investigation was carried out during 2014-2016 to find out the effect of nutrient management in Knolkhol to maximize the yield of knobs of Early White Vienna at the Orchard unit of the Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalai Nagar, Tamil Nadu. The experiment comprised of ten treatment combinations of organic, inorganic and biofertilizers viz., 100 per cent recommended dose of fertilizer (60:100:60 kg NPK/ha), T<sub>1</sub> - 100 per cent RDF + 25 t ha<sup>-1</sup> FYM (Normal Practice); T<sub>2</sub> - 75 per cent RDF + 2.5 t ha<sup>-1</sup> VC + bio fertilizer @ 2kg ha<sup>-1</sup>; T<sub>3</sub> - 50

per cent RDF + 5 t ha<sup>-1</sup> VC + bio fertilizer @ 2kg ha<sup>-1</sup>; T<sub>4</sub>- 75 per cent RDF + 2.5 t ha<sup>1</sup> neem cake + bio fertilizer @2kg ha<sup>-1</sup>; T<sub>5</sub> - 50 per cent RDF + 5 t ha<sup>1</sup> neem cake + bio fertilizer @2kg ha<sup>-1</sup>; T<sub>6</sub>- 75 per cent RDF + 2.5 t ha<sup>-1</sup> groundnut cake + bio fertilizer @2kg ha<sup>-1</sup>; T<sub>7</sub>- 50 per cent RDF + 5 t ha<sup>-1</sup> groundnut cake + bio fertilizer @ 2kg ha<sup>-1</sup>; T<sub>8</sub> - 75 per cent RDF + 2.5 tha<sup>1</sup> FYM + bio fertilizer @2kg ha<sup>-1</sup>; T<sub>9</sub> - 50 per cent RDF + 5t ha<sup>1</sup> FYM + bio fertilizer @2kg ha<sup>-1</sup> and T<sub>10</sub> - Absolute control. The experiment was laid out in Randomized Block Design and each treatment was replicated thrice. The various morphological observations, samples consisting of five plants were selected at random from each individual plot. For each sample, observations on various growth parameters were recorded at 15 days interval from 15 DAT. The observed data were statistically analysed adopting the formula suggested by Panse and Sukhatme (1978). For significant results, the critical difference was worked out at 5 per cent probability level.

## RESEARCH FINDINGS AND DISCUSSION

The data pertaining to the various observations on yield parameters in knolkhol have been shown in Table 1. The maximum value of volume of knob (103.47 ml) and knob diameter (horizontal and vertical) 7.67cm and 7.12 cm, respectively, were recorded due to the application of 50 per cent RDF + VC @ 5 t ha<sup>-1</sup> + biofertilizer @ 2 kg ha<sup>-1</sup>. The least was recorded in T<sub>10</sub> (Absolute control) (Table 1).

Application of vermicompost significantly increased the volume of knob and knob diameter in the present

study. The reason might be due to synergistic effect of organic manure and inorganic nitrogen. This might be due to prolonged availability of nutrients from vermicompost treated plot, resulting in increase of compactness of knob and weight of knob which ultimately increased the knob volume. These findings are in agreement with Choudhary *et al.* (2012) in broccoli.

Higher value for diameter of knolkhol was recorded under the treatment T<sub>3</sub> (50% RDF + VC @ 5 t ha<sup>-1</sup> + biofertilizers @ 2 kg ha<sup>-1</sup>). The reason might be due to synergistic effect of vermicompost, NPK and biofertilizers. The integrated approach was found to be superior in these aspects as well as for earliness which are in agreement with the results revealed by Islam (2011) and Devi and Singh (2012) in cabbage; Sharma *et al.* (2014) in cauliflower.

Application of 50 per cent RDF + VC @ 5t ha<sup>-1</sup> along with stated biofertilizers recorded highest knob yield (13.81 t ha<sup>-1</sup>). This might be due to the higher amount of vermicompost and reduced level of inorganic fertilizers in presence of biofertilizer, which would have increased the concentration of essential nutrients in soil solution ultimately resulting in steady uptake of major nutrients, sturdy plant growth and subsequently higher knob yield and quality. This findings is in agreement with Hartemink *et al.* (2000) who had reported highest yield in taro at 50 per cent RDF along with vermicompost and biofertilizers.

Certain other findings of Nedunchezhiyan and Srinivasulu Reddy (2002) in sweet potato; Kumar and Sharma (2004) in cabbage; Wani (2006) in cauliflower; Ghuge (2007) in cabbage; Chatterjee (2009); Sajib *et al.*

**Table 1 : Effect of nutrient management on fresh weight of knob, knob diameter, volume of knob and knob yield in knolkhol**

Treatments	Fresh weight of knob (g)	Knob diameter		Volume of knob (ml)	Knob yield (t ha <sup>-1</sup> )
		Horizontal and vertical			
T <sub>1</sub>	87.38	7.01	6.50	100.38	13.17
T <sub>2</sub>	89.64	7.29	6.62	101.54	13.43
T <sub>3</sub>	91.47	7.67	7.12	103.47	13.81
T <sub>4</sub>	84.39	6.41	6.13	90.40	12.51
T <sub>5</sub>	84.35	6.36	6.10	90.35	12.44
T <sub>6</sub>	82.43	5.42	5.30	85.43	11.64
T <sub>7</sub>	78.47	5.31	5.09	83.92	11.15
T <sub>8</sub>	86.29	6.67	6.37	96.30	12.83
T <sub>9</sub>	86.25	6.59	6.32	96.25	12.75
T <sub>10</sub>	75.42	5.04	5.00	80.22	10.52
S.E. <sub>±</sub>	0.17	0.03	0.04	0.12	0.10
C.D. (P=0.05)	0.36	0.07	0.09	0.27	0.21

(2015) in cabbage; Zaman *et al.* (2011) in potato; highlights the application of recommended dose of inorganic fertilizers to a tune of 50 per cent only along with specific combination of organic manures and biofertilizers. Such reports are to be prioritised for bringing down the dumping of chemical formulations and building in an eco-friendly atmosphere.

## REFERENCES

- Beecher, C. (1994).** Cancer preventive properties of varieties of *Brassica oleracea*: a review. *Amer. J. Clin. Nutri.*, **59** : 1166-1170.
- Chatterjee, R. (2009).** Production of vermicompost from vegetable wastes and its effect on integrated nutrient management of vegetable production, Ph.D. Thesis, Uttar Banga Krishi Viswavidyalaya, Pundibari, Coochbehar, West Bengal, India.
- Choudhary, S., Soni, A.K. and Jat, N.K. (2012).** Effect of organic and inorganic sources of nutrients on growth, yield and quality of sprouting broccoli cv. CBH-1. *Indian J. Hort.*, **69**(4): 550-554.
- Dahama, A.K. (1997).** *Organic farming for sustainable agriculture*, Ashila Offset Printers, Daruagung, New Delhi, India.
- Devi, K.B. and Singh, N.I. (2012).** Yield response of cabbage cv. Pride of India to varying levels of chemical fertilizer and vermicompost. *J. Agric. Vet. Sci.*, **1**(3): 08-11.
- Ghuge, T.D., Gore, A.K. and Jadhav, S.B. (2007).** Effect of organic and inorganic nutrient sources on growth, yield and quality of cabbage (*Brassica oleracea* var. capitata). *J. Soils & Crops*, **7**(1): 89-92.
- Hartemink, A.E., Johnston, M., Sullivan, J.N. and Poloma, S. (2000).** Nitrogen use efficiency of taro and sweet potato in the humid lowlands of Papua New Guinea. *Agric. Ecosys. Environ.*, **79** : 271-80.
- Islam, M.R. (2011).** A study of different organic manures on growth and yield of cabbage and their residual effect on stem amaranth, M.Sc. Thesis, Department of Horticulture, Bangladesh Agricultural University, Mymensingh, pp: 1-31.
- Kumar, P. and Sharma, S.K. (2004).** Integrated nutrient management or sustainable cabbage-tomato cropping sequence under mid-hill conditions of Himachal Pradesh. *Indian J. Hort.*, **1**(4): 331-334.
- Nedunchezhiyan, M. and Srinivasulu Reddy, D. (2002).** Growth, yield and soil productivity as influenced by integrated nutrient management in rainfed sweet potato. *J. Root Crops*, **30**: 41-45.
- Nieuwhof, M. (1996).** *Cole crops*. Leonard Hill Books, London, 353 pp.
- Panse, V.G. and Sukhatme, P.V. (1978).** *Statistical methods for agricultural workers*. ICAR Publ., NEW DELHI (INDIA).
- Sajib, K., Dash, P.K., Adhikary, B. and Md. Mannan, A. (2015).** Yield performance of cabbage under different combination of manures and fertilizers. *World J. Agric. Sci.*, **11**(6): 411-422.
- Sharma, A., Sharma, R.P., Sharma, G.D., Sankhyan, N.K., and Sharma, M. (2014).** Integrated nutrient supply system for cauliflower-french bean-okra cropping sequence in humid temperature zone of north-western Himalayas. *Indian J. Hort.*, **71** (2) : 211-216.
- Wani, A.J. (2006).** Effect of organic manures and inorganic fertilizers in growth and curd yield of cauliflower (*Brassica oleracea* var. botrytis L.) cv. SNOWBALL 16. M.Sc. Thesis, Sher-e-Kashmir University of Agricultural Science and Technology of Kashmir, Srinagar.
- Zaman, A., Sarkar, A., Sarkar, S. and Devi, W.P. (2011).** Effect of organic and inorganic sources of nutrients on productivity, specific gravity and processing quality of potato. *Indian J. Agric. Sci.*, **81**: 1137-1142.

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