



Research Article

Effect of integrated nutrient management on quality of garlic (*Allium sativum* L.)

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ABSTRACT : The present investigation entitled effect of integrated nutrient management on growth, yield and quality of garlic (*Allium sativum* L.) was under taken at Horticultural Instructional Farm, C. P. College of Agriculture, S. D. Agricultural University, Sardarkrushinagar in Rabi season 2010-11. The experiment was laid out in Randomized Block Design with four replications and nine treatments viz., T₁ (RDF-100:50:50), T₂ (50% N in form of FYM+ 50% N in form of inorganic), T₃ (100% N in form of FYM), T₄ (50% N in form of de oil castor cake+ 50% N in form of inorganic), T₅ (100% N in form of de oil castor cake), T₆ (50% N in form of poultry manure+ 50% N in form of inorganic), T₇ (100% N in form of poultry manure), T₈ (50% N in form of vermicompost+ 50% N in form of inorganic) and T₉ (100%N in form of vermicompost). The maximum TSS (48.50 °Brix) of bulb and N (261.00 kg ha⁻¹), P (28.50 kg ha⁻¹) and K (252.00 kg ha⁻¹) in soil after harvest were found in treatment T₂ (50% N in form of FYM+ 50% N in form of inorganic).

KEY WORDS : Garlic, Organic and inorganic nutrients, Integrated nutrient management

How to cite this Article : Sevak, Kuldeep, Patel, N.M., Bhadhauria, H.S. and Wankhade, V.R. (2012).Effect of integrated nutrient management on quality of garlic (*Allium sativum* L.), *Internat. J. Forestry & Crop Improv.*, 3 (2) : 147-148.

Article Chronical : Received : 21.09.2012; Revised : 30.10.2012; Accepted : 20.11.2012

INTRODUCTION

Garlic (*Allium sativum* L.) is an important bulb crop widely used as a spice or condiment. It's belonging to Alliaceae family and known by several local names in different parts of India. In India it is widely known as Lahsun. It is a valuable condiment which is indispensable part of many of the food items in India. Garlic possesses medicinal properties and it is a very popular medicinal plant. It is a hardy bulbous perennial plant having narrow flat leaves. The economic part of plant which comprise

of 6 to 30 smaller bulblets called 'cloves'. Garlic is frost hardy plant requiring cool and moist period during growth and relatively dry period during maturity of bulbs. The critical day length for bulb development is 12 hrs. Day length also affects bulbing. Garlic has several medicinal values. It reduces the cholesterol in blood. For better biometric observations, bulb characters and marketable bulb yield in garlic, combined use of inorganic and organic sources of nutrient supply is preferable. (Patil *et al.*, 2007). The pungency, strong flavour and keeping quality of garlic is found to be associated with the Diallyl disulphide content.

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EXPERIMENTAL METHODS

A field experiment was conducted during the Rabi season of the year 2010-2011 at Horticultural Instructional Farm, Chimanbhai Patel College of Agriculture, Sardarkrushinagar, Dantiwada Agricultural University, Sardarkrushinagar. The Horticultural Instructional Farm of Sardarkrushinagar (Dantiwada campus) is located at 72^o-19^o East longitude and

Table 1 : Effect of integrated nutrient management on quality parameters of garlic

Sr. No.	Treatment detail	Total soluble solids ($^{\circ}$ Brix)	Bulb diameter (cm)	No. of cloves bulb ⁻¹	Average weight of bulb (g)	Weight of 100 cloves (g)
T ₁	RDF (100:50:50)	44.00	4.50	24.00	25.30	79.00
T ₂	50% N in form of FYM+ 50% N in form of inorganic fertilizer	48.50	5.60	21.75	28.18	86.25
T ₃	100% N in form of FYM	46.75	5.25	23.25	26.33	81.75
T ₄	50% N in form of de oil castor cake+ 50% N in form of inorganic fertilizer	43.25	3.95	26.78	24.65	78.25
T ₅	100% N in form of de oil castor cake	46.25	4.28	26.75	24.10	79.75
T ₆	50% N in form of poultry manure+ 50% N in form of inorganic fertilizer	43.25	3.50	23.27	24.30	78.25
T ₇	100% N in form of poultry manure	40.75	3.25	28.50	22.25	78.31
T ₈	50% N in form of vermi compost+ 50% N in form of inorganic fertilizer	44.75	4.75	25.25	24.95	80.25
T ₉	100% N in form of vermi compost	45.25	4.33	24.75	25.80	72.50
S.E. \pm		1.27	0.25	0.25	0.99	0.79
C.D. (P=0.05)		3.70	0.73	0.73	2.89	2.29
C.V. %		5.66	11.48	11.48	7.94	6.26

24^o-19^o North latitude at 154.42 meter sea level. Nine treatment combinations were allocated randomly in different plots by using the random numbers. The treatments were replicated four times in Randomized Block design (R.B.D). Ten plants were selected at random from the net plot of each treatments and tagged to record the observations. The numbers of bulbs harvested from each net plot were weighed in kilogram and the total yield was estimated on hectare basis and expressed in t/ha.

EXPERIMENTAL RESULTS AND ANALYSIS

Maximum TSS (48.50 $^{\circ}$ Brix) was recorded in treatment T₂ (50% N in form of FYM+ 50% N in form of inorganic), which was found at par with treatment T₃, T₅ and T₉. Whereas the minimum TSS (40.75 $^{\circ}$ Brix) was found in treatment T₇, which was at par with treatment T₁, T₄ and T₆. Organic manures are capable of supplying adequate macro and micro plant nutrients which play major role in quality improvement through desirable enzymatic changes taking place during growth. Response of castor cake in improving soil nutrition is well established fact and combined use of inorganic fertilizer with castor cake enhance the quality of produce (Verma *et al.*, 1996, Sardar and Singh, 1999; Singh, 2002 in garlic).

The maximum diameter of bulb (5.60 cm) was found in treatment T₂ (50% N in form of FYM+ 50% N in form of inorganic), whereas the minimum diameter of bulb (3.25 cm) was found in treatment T₇. Significantly the lowest number of cloves bulb⁻¹ (21.75) was found in treatment T₂ (50% N in form of FYM+ 50% N in form of inorganic). Whereas the highest number of cloves was found in treatment T₇ (28.50). Maximum average weight of bulb (28.18 g) was found in treatment T₂

(50% N in form of FYM+ 50% N in form of inorganic). Whereas the minimum average weight of bulb was found in treatment T₇ (22.25 g). Maximum weight of 100 cloves (86.25 g) was found in treatment T₂ (50% N in form of FYM+ 50% N in form of inorganic). Whereas the minimum weight of 100 cloves was found in treatment T₉ (72.50 g). The increased availability of nutrients and production of growth promoting substances might have caused faster cell elongation and multiplication.

From the forgoing discussion it can be concluded that among the various treatment combinations, performance of the treatment of 50 per cent N in form of FYM+ 50 per cent N in form of inorganic (T₂) was superior than all other treatments with respect to growth and quality of garlic. Therefore, treatment T₂ can be suggested to the farmers for reduced dosage of inorganic fertilizers which considerably improves soil fertility status and economically beneficial also.

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