

Effect of Integrated Nutrient Management on growth and yield of garlic (*Allium sativum* L.)

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ABSTRACT : The present investigation entitled effect of integrated nutrient management on growth and yield 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). At 30, 60, 90 and 120 DAP, the treatment T₂ (50% N in form of FYM+ 50% N in form of inorganic) recorded the significantly maximum plant height (38.50, 49.25, 52.25 and 54.25 cm, respectively), number of leaves plant⁻¹ (5.10, 8.10, 10.12 and 11.19 cm, respectively), neck thickness (0.56, 0.66, 0.86 and 1.02 cm, respectively) at 30, 60, 90 and 120 DAS. Similarly treatment T₂ recorded the minimum days to maturity (132.75) and number of cloves bulb⁻¹ (21.75) with maximum diameter of bulb (5.60 cm), average weight of bulb (28.18 g), weight of 100 cloves (86.25 g) and yield plot⁻¹ (6.61 kg) and yield hectare⁻¹ (34425 kg).

Key Words : Garlic, INM, Organic and inorganic nutrients

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Garlic (*Allium sativum* L.) is an important bulb crop widely used as a spice or condiment. Its belongs to Alliaceae family and is 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 very popular medicinal plant. It is a hardy bulbous perennial plant having narrow flat leaves. The economic part of plant which comprise 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 is 12 hrs. 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.

RESEARCH PROCEDURE

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°-19' East longitude and 24° -19' North latitude at 154.42 meter above 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.

RESEARCH ANALYSIS AND REASONING

The results are presented in Table 1 and 2. From the present investigation it can be concluded that performance of the treatment T₂ (50% N in form of FYM+ 50% N in form of inorganic) was superior than all the other treatments in respect of growth and yield of garlic. Therefore treatment T₂ can be suggested to the farmers for reduced dosage of inorganic fertilizers, considerable improvement in soil fertility status and economic benefit. Significantly maximum Plant height, Number of leaves plant⁻¹ and Neck thickness (at 30, 60, 90 and 120 DAS, respectively) was recorded in the treatment T₂ (50% N in form

of FYM+ 50% N in form of inorganic) (Singh, 2002).

There were significant differences observed due to different levels of organic manure, inorganic fertilizer as well as combination of organic and inorganic fertilizers in respect of growth and yield of garlic. The size of bulb was directly influenced by the enhanced vegetative growth *i.e.* increase in height and number of green leaves (Kore *et al.*, 2006, Gaiki *et al.*, 2006).

Similarly treatment T₂ recorded the minimum days to maturity (132.75) and number of cloves bulb⁻¹ (21.75) with maximum diameter of bulb (5.60 cm), average weight of bulb (28.18 g), weight of 100 cloves (86.25 g), yield plot⁻¹ (6.61 kg) and yield hectare⁻¹ (34425 kg). The increasing enhanced availability of nutrients and production of promoting

Table 1 : Effect of integrated nutrient management on growth of Garlic at 30, 60, 90 and 120 DAS

Sr. No.	Treatments DAS	Plant height (cm)				Number of leaves				Neck thickness (cm)				Days to maturity
		30	60	90	120	30	60	90	120	30	60	90	120	
T ₁	RDF (100:50:50)	34.00	44.00	46.25	49.00	4.00	7.00	9.02	10.10	0.49	0.59	0.79	0.89	149.75
T ₂	50% N in form of FYM+ 50% N in form of inorganic	38.50	49.25	52.25	54.25	5.10	8.10	10.12	11.19	0.56	0.66	0.86	1.02	132.75
T ₃	100% N in form of FYM	37.00	47.25	50.25	52.25	4.75	7.75	9.77	10.84	0.53	0.64	0.32	0.96	141.00
T ₄	50% N in form of de oil castor cake+ 50% N in form of inorganic	34.75	44.75	47.00	49.75	3.75	6.45	8.46	9.54	0.48	0.58	0.78	0.88	145.25
T ₅	100% N in form of de oil castor cake	36.75	46.75	49.75	51.75	3.78	6.78	8.79	9.87	0.52	0.62	0.82	0.92	145.00
T ₆	50% N in form of poultry manure+ 50% N in form of inorganic	33.25	43.25	46.25	48.25	3.00	6.00	8.01	9.09	0.48	0.58	0.78	0.88	144.25
T ₇	100% N in form of poultry manure	31.71	41.75	44.74	46.78	2.75	5.75	7.76	8.84	0.45	0.54	0.74	0.81	156.25
T ₈	50% N in form of vermicompost+ 50% N in form of inorganic	35.25	45.20	49.75	50.15	4.25	7.25	9.27	10.32	0.50	0.60	0.80	0.90	152.25
T ₉	100% N in form of vermicompost	35.25	45.25	48.25	50.25	3.83	6.83	8.84	9.91	0.50	0.60	0.80	0.91	148.25
S.E. ±		0.96	1.22	1.22	1.34	0.25	0.25	0.25	0.26	0.01	0.02	0.02	0.03	3.66
C.D. (P=0.05)		2.79	3.57	3.57	3.92	0.73	0.73	0.74	0.75	0.04	0.05	0.06	0.08	10.67
C.V. %		5.47	5.43	5.09	5.37	12.96	7.31	5.68	5.17	5.72	5.8	4.77	5.85	5.01

Table 2 : Effect of integrated nutrient management on bulb diameter (cm) in garlic

Sr. No.	Treatments	Bulb diameter (cm)	No. of cloves bulb ⁻¹	Average weight of bulb (g)	Weight of 100 cloves (g)	Yield (kg/Plot)	Yield (kg/ha)
T ₁	RDF (100:50:50)	4.50	24.00	25.30	79.00	5.50	28644
T ₂	50% N in form of FYM+ 50% N in form of inorganic	5.60	21.75	28.18	86.25	6.61	34425
T ₃	100% N in form of FYM	5.25	23.25	26.33	81.75	5.28	27498
T ₄	50% N in form of de oil castor cake+ 50% N in form of inorganic	3.95	26.78	24.65	78.25	5.33	27759
T ₅	100% N in form of de oil castor cake	4.28	26.75	24.10	79.75	4.95	25780
T ₆	50% N in form of poultry manure+ 50% N in form of inorganic	3.50	23.27	24.30	78.25	4.85	25259
T ₇	100% N in form of poultry manure	3.25	28.50	22.25	78.31	4.25	22134
T ₈	50% N in form of vermicompost+ 50% N in form of inorganic	4.75	25.25	24.95	80.25	6.00	31248
T ₉	100% N in form of vermicompost	4.33	24.75	25.80	72.50	5.75	29946
S.E. ±		0.25	0.99	0.79	2.02	0.19	287
C.D. (P=0.05)		0.73	2.89	2.29	5.89	0.56	839
C.V. %		11.48	7.94	6.26	5.07	10.77	10.77

substances that might have caused cell elongation and multiplication. The increased availability of nutrients and production of growth promoting substances might have caused faster cell elongation and multiplication.

LITERATURE CITED

- Gaiki, U.R.**, Jogdande, N.D., Dalal, S.R., Nandre, D.R. and Ghawade, S.M. (2006). Effect of biofertilizer under reduced doses of inorganic fertilizers on growth and yield of garlic. *Plant-Archives*, **6**(1):367-368.
- Kore, M.S.**, Shembekar, R.Z., Chopde, N.K., Kuchanwar, O.D., Pillewan, S.S. and Godse, S.B. (2006). Nutrient management in garlic (*Allium sativum* L.). *J. Soils & Crops*, **16**(2):465-468.
- Patil, M.B.**, Shitole, D.S., Shinde, S.B. and Purandare, N.D. (2007). Response of garlic to organic and inorganic fertilizers. *J. Hort. Sci.*, **2**(2): 130-133.
- Singh, S.R.** (2002). Effect of organic farming on productivity and quality of garlic. *Legume Res.*, **25**(2): 124-126.
