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Research Note :

IMPACT OF FRONT LINE DEMONSTRATION OF INM ON GROWTH AND YIELD IN TOMATO

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ABSTRACT : A field experiment was conducted at the Farm of Krishi Vigyan Kendra Pampoli, East Kameng, Arunachal Pradesh. The effect of Integrated Nutrient Management (INM) on the growth, yield and contributing nutrient status in tomato. By following a randomized complete block design, 9 treatments with 3 replications were maintained. The study revealed that the integration of organic manures in combination with inorganic fertilizers was found significant in improving the overall plant growth, yield and soil macro nutrient status than the sole application of either of these nutrients. Maximum plant height and number of leaves per plant were observed with treatment 14.33 mt/ha FYM + 7.20 mt/ha Vermicompost + NPK. The earlier of days to 50% flowering was observed in treatment 20 mt/ha FYM. Highest number of fruit clusters, maximum fruit weight and fruit yield (26.74 mt/ha) were recorded in treatment 14.33 mt/ha FYM + 7.20 mt/ha Vermicompost + NPK. The highest available nitrogen, phosphorus and potassium were found in treatment of ½ NPK + 15 mt/ ha vermicompost.

Keywords : *INM, NPK, vermicompost, FYM, tomato.*

Tomato (*Lycopersicon esculentum* Mill .) is one of the most important vegetable crops of India. It is used as a vegetable, soup, salad, pickle, ketchup, puree, sauce and many other ways. It is a good source of vitamin A, B and C. Tomato has acquired the status of world's most popular vegetable crop due to its wider adaptability to various agro climatic conditions. At present, tomatoes rank second, next to potato. Integrated Nutrient Management refers to the maintenance of soil fertility and of plant nutrient supply at an optimum level for sustaining the desired productivity through optimization of the benefits from all possible sources of organic, inorganic and biological components in an integrated manner (Kumar *et al.,* 5). While little information is available on the combined effect of NPK and organic manures on tomato, this study was made to find out the effect of INM on the soil nutrient status of tomato. Fertilizers, no doubt, have played a key role in agriculture production and have changed Asia from a region of food scarcity to food sufficiency. But the fertilizer production is largely dependent on the nonrenewable energy sources. Consequently, the use of organic manures to supplement fertilizers has declined substantially. Front line demonstrations on vegetables (Suman, 10) and chickpea (Singh *et al.,* 9) had shown high impact for enhancing crop's productivity.

All the parents were sown at Research Farm of the Krishi Vigyan Kendra, Pampoli, East Kameng, Arunachal Pradesh during 2011-12. Five week old tomato seedlings were transplanted at main field at a distance of 60 x 45 cm.The experiment was laid out in a randomized complete block design with 3 replications. There were 9 treatments *viz.,* T_1= FYM 20 mt/ha FYM, T_2 = Half of the recommended NPK + 30 mt/ha FYM, T_3 = Three fourth of the recommended NPK + 25 mt/ha, T_4 = 10 mt/ha Vermicompost, T_5 = Half of the recommended NPK + 15 mt/ha Vermicompost, T_6 = Three fourths of the recommended NPK +12.5 mt/ha Vermicompost, T_7 = 14.33 mt/ha FYM + 7.20 mt/ha Vermicompost + NPK, T_8 = Recommended NPK (100: 80: 60 kg/ha), and T_9 = Control (no organic manures and inorganic fertilizers).The treatments were tested at 5% level of significance. The required amounts of fertilizers and manures were weighed by a weighing balance separately. Organic manures were applied in the field an hour before transplantation by mixing properly with soil. In case of chemical fertilizers, half of the total amount was basal dressed and the remaining half was in circular furrows. The data were collected on six quantitative characters, *viz.,* days to 50% flowering, plant height (cm), number of leaves per plant, number of fruit clusters per plant, fruit weight (g), and yield per plant. While the estimations and analysis of available nitrogen, available phosphorus, and available potash were done in the soil laboratory of AAU, Jorhat, Assam.

The maximum plant height (114.12 cm) was observed (Table 1) with T_7 (14.33 mt/ha FYM + 7.20

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mt/ha Vermicompost +NPK). The better performance of organic manures in combination with inorganic fertilizers might be due to the fact that the organic manures would have provided the micronutrients in an optimum range to the plant. Application of organic manures would have helped in enhancing the metabolic activity through the supply of such important micronutrients in the early growth phase which in turn must have encouraged the overall growth. Dubey *et al.* (2) in garden pea and Kumar *et al.* (6) in ashwagandha have also reported the highest plant growth due to the combined application of organic manures and chemical fertilizers. The earliness in days to 50% flowering (25.21) was recorded in treatment T_1 (20 mt/ha FYM). The earliness in flowering could be attributed to the faster enhancement of vegetative growth and storing sufficient reserved food materials for differentiation of buds into flower buds whereas the delayed flowering by the inorganic fertilizer treatment could be due to extended vegetative phase of the plant by the availability of inorganic nitrogen. Maximum number of leaves per plant (114.50) was recorded in treatment T_7 (14.33 mt/ha FYM + 7.20 mt/ha vermicompost + NPK (Table 1). Data clearly indicated that vegetative growth was higher in plots that received integrated (organic and inorganic) nutrient supply. This might be due to the fact that the application of NPK, FYM and vermicompost provided adequate N which is associated with high photosynthetic activity and vigorous vegetative growth. Combination of organic, biofertilizers and inorganic fertilizers significantly increased the number of leaves in cabbage (Kumar *et al.,* 4). The maximum fruit weight (55.90 g) was recorded in 14.33 mt/ha FYM + 7.20 mt/ha Vermicompost +NPK. This might be due to solubilization effect of plant nutrients by the addition of FYM and Vermicompost leading to increased uptake of NPK. Maximum number of fruit clusters (7.21/plant) was recorded with T_7 (14.33 mt/ha FYM + 7.20 mt/ha Vermicompost + NPK). This confirms the significance of conjunctive use of chemical and organic fertilizers than the individual one which might be due to the solubilization effect of plant nutrients by the addition of FYM and Vermicompost leading to increased uptake of NPK.(Bahadur *et al.,* 1). Tomato fruit yield was affected significantly by different treatments. Maximum yield (26.74 mt/ha) was observed in T_7 (14.33 mt/ha FYM + 7.20 mt/ha Vermicompost + NPK. The reasons for increased fruit yield by the application of NPK with FYM and Vermicompost leading to increased uptake of NPK. The results are in agreement with the findings of Kumar and Sharma (3), Malik and Kumar (8), and Kumaran *et al.* (7) who recorded an increase in fruit yield by the application of integrated doses of NPK with FYM and Vermicompost.

Table 1: Effect of integrated nutrient management in tomato.

Treatments	Days to 50% flowering	Plant height (cm)	Number of leaves per plant	Number of clusters per plant	Fruit weight (g)	Yield (mt/ha)
T_1 FYM (20 mt/ha)	25.21	105.13	108.55	4.89	39.54	20.71
T_2 – Half of the recommended NPK + 30 mt/ha FYM	26.00	112.33	106.44	5.45	44.98	25.81
T_3 –Three fourths of the recommended NPK + 25 mt/ha	28.00	109.90	107.71	5.63	50.01	25.10
T_4 –10 mt/ha Vermicompost	26.00	106.41	105.50	6.81	43.82	23.07
T_5 – Half of the recommended NPK + 15 mt/ha Vermicompost	28.55	110.60	112.33	7.10	49.41	26.29
T_6 –Three fourths of the recommended NPK +12.5 mt/ha Vermicompost	28.66	110.72	109.33	6.96	52.78	25.33
T_7 – 14.33 mt/ha FYM + 7.20 mt/ha Vermicompost +NPK	26.33	114.12	114.50	7.21	55.90	26.74
T_8 –(Recommended NPK 100: 80: 60 kg/ha	30.50	107.50	112.44	6.40	42.53	22.70
T_9 –Control	31.33	95.57	97.95	6.06	35.28	20.07
CD (P=0.05)	1.67	1.44	3.76	0.14	7.82	2.25

REFERENCES

1. Bahadur, A., Singh, J. and Singh, K.P. (2004). Response of cabbage to organic manures and biofertilizers. *Indian J. Hort.,* **61**(3):278-279.
2. Dubey, D.K., Singh, S.S., Verma, R.S. and Singh, P.K. (2012). Integrated nutrient management in garden pea (*Pisum sativum* var. *hortense*). *HortFlora Res. Spectrum*, **1**(3) : 208-214.
3. Kumar, P and Sharma, S.K. (2004). Integrated nutrient management for sustainable cabbage-tomato cropping sequence under mid hill conditions of Himachal Pradesh. *Indian J. Hort.,* **61**(4): 331-334.
4. Kumar, V., Akbar, P.I. and Malik, M.F. (2008). Response of cabbage to vermicompost and biofertilizer application. *Haryana J. Hortic. Sci.,* **37**(1&2) : 132-134.
5. Kumar, A., Sharma, S. and Mishra, S. (2009). Application of farmyard manure and vermicompost on vegetative and generative characteristics of *Jatropha curcas. J. Phytopathol.,* **1**(4): 206-222.
6. Kumar, N., Kumar, V. and Singh, M.C. (2012). Response of bio-organic nutrition on growth, yield and quality of Ashwagandha (*Withania somnifera* Dunal.). *HortFlora Res. Spectrum,* **1**(3) : 208-214.
7. Kumaran, S., Natarajan, S. and Thamburaj, S. (1995.) Effect of organic and inorganic fertilizers on growth, yield and quality of tomato. *South Indian Hort.,* **46** (3 & 4):203-205.
8. Malik, M.F. and Kumar, V. (2009). Influence of INM on growth and yield of tomato. *Annals Hort.,* **2**(2) : 221-223.
9. Singh, D.D., Patel, A.K., Baghel, M.S., Singh, S.K. and Singh, A.K. (2014). Impact of front line demonstration on the yield and economics of chickpea (*Cicer arietinumn* L.) in Sidhi district of Madhya Pradesh. *J. AgriSearch,* **1**(1) : 22-25.
10. Suman, R.S. (2014). Attitude of farmers towards sustainability of vegetable cultivation. *J. AgriSearch,* **1** (1) : 1-3.

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