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Short Communication

Effect of Integrated Nutrient Management (INM) on Growth of Okra (*Abelmoschusesculentus* L.) cv. Parbhani Kranti

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Okra (*Abelmoschusesculentus* L.) is an economically important vegetable crop grown in tropical and sub - tropical parts of the world. Okra is a warm season vegetable crop and it grows best in hot summer with minimum and maximum temperatures of 18°C and 35°C respectively[4]. In India it is grown during summer and rainy season. It is extensively grown for its immature green fruits. Okra seeds are also good sources of quality edible oil and protein. The dry seeds of okra contain 14-23 % of edible oil and 21-25 % of protein. Integrated nutrient management (INM) is a holistic, approach that considers all the available farm resource that can be used as plant nutrients. Nutrients added through combined inorganic and organic sources are better utilized than inorganic alone, besides reducing cost of production and maintaining the soil health. Application of FYM and vermicompost or in combination with chemical fertilizers improved the soil organic C, total NPK status. Farm yard manure is multi-nutrient organic fertilizer, which is prepared by using cow dung, cow urine, waste straw and other dairy wastes. Biofertilizers, a component of integrated nutrient management; are considered to be cost effective, eco-friendly and renewable and non bulky plant nutrient supplementing fertilizers in sustainable agriculture system in India.Biofertilizers such as *Azospirillum* and PSB have potential practical applications, which contribute to increasing crop productivity through increased biological nitrogen fixation, increased availability or uptake of nutrients through phosphate solubilization or increased absorption, stimulation of plant growth or by rapid decomposition of organic residues.

The experiment was laid out in the Randomized Block Design with three replications. Each replication was comprised of ten treatment combinations(T_1 – 100 % RDF, T_2 – 75 % RDF + *Azotobacter*, T_3 – 75 % RDF + PSB, T_4 – 75 % RDF + *Azotobacter* + PSB, T_5 – 75 % RDF + Vermicompost + *Azotobacter*, T_6 – 75 % RDF + Vermicompost + PSB, T_7 – 75 % RDF + Vermicompost + *Azotobacter* + PSB, T_8 – 75 % RDF + FYM + *Azotobacter*, T_9 – 75 % RDF + FYM + PSB and T_{10} – 75 % RDF + FYM + *Azotobacter* + PSB)were applied in okra (*Abelmoschusesculentus* L.) variety Parbhani Kranti. FYM @25 ton/ha was thoroughly mixed in the soil one week prior to sowing and basal dose of vermicompost @ 12 ton/ha was incorporated in soil one week before sowing and treated with two biofertilizers

Table no. 1 Effect of integrated nutrient management (INM) on growth parameters of okra

Treatment symbols	Treatment detail	Plant height (cm)		Number of branches/plant		Number of leaves/plant		Days to flowering	Days to 50 % flowering
		45 DAS	90 DAS	45 DAS	90 DAS	45 DAS	90 DAS		
T_1	100 % RDF	33.43	67.66	2.97	3.18	15.99	31.87	39.17	46.75
T_2	75 % RDF + *Azotobacter*	27.87	56.84	2.52	2.95	11.90	28.66	42.77	50.00
T_3	75 % RDF + PSB	26.11	55.12	2.40	2.90	11.12	28.12	43.11	50.43
T_4	75 % RDF + *Azotobacter* + PSB	28.40	59.41	2.61	2.97	12.29	29.02	42.39	49.77
T_5	75 % RDF + Vermicompost + *Azotobacter*	31.60	65.57	2.90	3.14	14.87	30.85	40.24	47.65
T_6	75 % RDF + Vermicompost + PSB	29.59	62.83	2.75	3.05	13.10	29.85	41.52	48.76
T_7	75 % RDF + Vermicompost + *Azotobacter* + PSB	34.10	68.40	3.00	3.20	16.11	32.41	38.10	46.10
T_8	75 % RDF + FYM + *Azotobacter*	30.89	64.41	2.86	3.07	14.11	30.28	40.76	48.23
T_9	75 % RDF + FYM + PSB	29.19	60.83	2.67	3.01	12.56	29.43	41.94	49.42
T_{10}	75 % RDF + FYM + *Azotobacter* + PSB	32.71	66.92	2.93	3.17	15.35	31.64	39.89	47.03
	SEm ±	**0.211**	**0.293**	**0.033**	**0.023**	**0.093**	**0.059**	**0.079**	**0.082**
	CD 5%	**0.627**	**0.870**	**0.098**	**0.069**	**0.276**	**0.176**	**0.234**	**0.245**

such as *Azotobacter* and PSB @ 10g/kg seed as per requirement of the treatment.

Results clearly showed (Table 1) that the different treatments combinations involving organic manures (viz., FYM and vermicompost) and biofertilizers (viz., *Azotobacter*and PSB) with different dose of RDF fertilizers were significantly influenced the growth parameters in okra. It was recorded that the maximum plant height, number of branches/plant and number of leaves/plant at 45 and 90 DAS were found in treatment T_7 (75 % RDF + Vermicompost + *Azotobacter* + PSB) and it was found the best treatment among all the treatments. However, the minimum plant height, number of branches/plant and number of leaves/plant at 45 and 90 DAS were recorded in treatment T_3 (75 % RDF + PSB), whereas the minimum days to flowering and 50 % flowering were noted in treatment T_7 (75 % RDF + Vermicompost + *Azotobacter* + PSB) and the maximum days to flowering and 50 % flowering were observed in treatment T_3 (75 % RDF + PSB). This might be directly associated with the increased availability of nitrogen and phosphorus through biological fixation of N and solubilization of P in soil in readily utilizable form by the plants. Nitrogen and phosphorus are the major plant nutrients and dual inoculation of nitrogen fixer and phosphorus solubilizer benefit the plant for improving the growth parameters. The beneficial effect of organic manures like FYM and vermicompost on plant growth might be attributed to the fact that the higher level of microbial population mineralized the macro and micronutrients during vermicomposting and made available to crop plants for longer period. The vermicompost improve the physical and biological properties of soil including supply of almost all the essential plant nutrients for the growth and development of plant.These results are supported by the findings of many others[1, 2, 3, 5, 6, 7].

Conclusion

Result concluded that the different treatments combinationsinvolving organic manures (viz., FYM and vermicompost) and biofertilizers (viz., *Azotobacter*and PSB) with different dose of RDF fertilizers were significantly influenced the growth parameters in okra. It was recorded that the maximum growth parameters were found in treatment T_7 (75 % RDF + Vermicompost + *Azotobacter* + PSB) and it was found the best treatment among all the treatments. However, the minimum growth parameters were recorded in treatment T_3 (75 % RDF + PSB).

References

1. Amran, H.A., Prasad, V.M. and Saravanan, S. (2014). Effect of FYM on Growth, Yield and Fruits Quality of Okra (*Abelmoschus Esculentus*. L Moench). *IOSR Journal of Agriculture and Veterinary Science*, **7**: 07-12.
2. Baliah, N.T., Priyatharsini, S.L. and Priya, C. (2015). Effect of organic fertilizers on the growth and biochemical characteristics of okra (*Abelmoschusesculentus* (L.) Moench). *International Journal of Science and Research*, **6**: 2319-7064.
3. Mal, B., Mahapatra, P., Mohanty, S., and Mishra, H.N. (2013). Growth and yield parameters of okra (*Abelmoschusesculentus*) influenced by diazotrophs and chemical fertilizers. *Journal of Crop and Weed*, **9**(2): 109112.

4. Sajid, M., Khan, M.A., Rab, A., Shah, S.N.M., Arif, M., Jan, I., Hussain, Z. and Mukhtiar, M. (2012). Impact of nitrogen and phosphorus on seed yield and yield components of okra cultivars. *The Journal of Animal & Plant Sciences*, **22**(3):704-707.
5. Sindhya, P., Pandit, M.K., Bairagi, S. and Shyamal, M.M. (2015). Effect of mycorrhizal inoculation, organic manure and inorganic fertilizers on growth and yield of okra [*Abelmoschusesculentus* (L.) Moench]. *Journal Crop and Weed,* **11**(Special Issue): 1013.
6. Singh, J. (2015). Effect of inorganic and biofertilizers on vegetative growth and yield of okra (*Abelmoschusesculentus* L. Moench.) cv. Arka Anamika. *Hort Flora Research Spectrum*, **4**(4): 377379.
7. Tyagi, S.K., Shukla, A., Mittoliya, V.K., Sharma, M.L., Khire, A.R. and Jain, Y.K. (2016). Effect of integrated nutrient management on growth, yield and economics of okra [*Abelmoschusesculentus* (L.) Moench.] under Nimar Valley conditions of Madhya Pradesh. *International Journal of Tropical Agriculture*, **34**(2): 415419.