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Assessment of integrated nutrient management in okra hybrid CoBh H1

■ **M.I. Manivannan and S. Irulandi**

Members of the Research Forum

Associated Authors:
[1]Department of Fruit Crops and Post Harvest Technology, Horticultural College and Research Institute, Periyakulam (T.N.) India

Author for correspondence :
M.I. Manivannan
Department of Horticulture, Agricultural College and Research Institute, Killikulam (T.N.) India
Email : mimanivannan@rediffmail.com

ABSTRACT : An farm trial on integrated nutrient management in okra was undertaken at Krishi Vigyan Kendra, Kanyakumari to find out the combined effect of organic manures, biofertilizers and inorganic fertilizers over the traditional method in Okra hybrid CoBh H1 on yield, quality parameters and economic feasibility in Kanyakumari district. The trial was conducted during 2016 in five farmers field in a total area of 2 hectares located at Thuckalay block of Kanyakumari district. The assessment of integrated nutrient management was observed in Okra hybrid CoBh H1 with the technology options as recommended by TNAU CPG (2013) and KAU CPG (2011). The traditionally adopted farmers practice *i.e.*, farm yard manure 25 t/ha+ imbalanced use of fertilizer was also included in the trial for assessment. Various yield parameters *viz.*, days to 50% flowering, number of fruits per plant and yield (q/ha) and the benefit cost ratio was recorded for the individual farmer. Minimum number of days to flowering (52.0), higher number of fruits per plant (71.8), yield (274.8 q/ha) and cost benefit ratio (3.00) was registered with the technology as suggested by TNAU CPG (2013) wherein maximum number of days to flowering (55.2.0), minimum number of fruits per plant (47.6) , yield (230.2 q/ha) and cost benefit ratio (2.78) was recorded with farmers practice.

KEY WORDS : INM, Okra, CoBh H1

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Vegetables play an important role in providing a balanced diet by supplying nutrients, vitamins, minerals and antioxidants. Though India is the second largest producer of vegetables in the world accounting for 14 per cent of the global vegetable production, the area and production of vegetables have almost plateaued since 2005 and the vegetable consumption of an average Indian is 183 g far less than the recommended the dietary allowance of 300 g. This demand supply gap is likely to widen further.

Water and nutrients are the two most critical inputs needed to be managed efficiently not only to increase the yield but also to sustain the quality.Inorganic fertilizers are one of the most expensive inputs in vegetable production.Besides, continuous application of huge amount of chemical fertilizers hampers the quality, soil health and soil productivity. As such, it is necessary that fertilizer application should be made through both inorganic and organic sources. Integrated nutrient management has been well recognized as an efficient and ecofriendly method of applying manures and fertilizers judiciously for maximizing productivity and net returns in horticultural crops.

With this background the present on farm trial on integrated nutrient management was undertaken to find out the combined effect of organic manures, biofertilizers and inorganic fertilizer over the traditional method in hybrid okra on yield, quality parameters and economic

feasibility of okra fruits.

RESEARCH METHODS

The on farm trial was conducted during 2016 in five farmers field in a total area of 2 hectares located at Thuckalay block of Kanyakumari district. The trial was also conducted at the farm of Krishi Vigyan Kendra, Thirupathisaram in an area of 15 cents. The assessment of integrated nutrient management was observed in Okra hybrid CoBh H1 with the technology options as recommended by TNAU CPG (2013) *i.e., Azospirillum* and phosphobacteria @ 2 kg/ha +farm yard manure 25 t/ha +20:50:30 NPK kg/ha as basal+20 kg N/ha at 30 days after sowing+ IIHR vegetable special and as recommended by KAU CPG (2011) *i.e.,* farm yard manure 12 t/ha +55:35:70 NPK kg/ha as basal+55 kg N/ha at 30 days after sowing+ IIHR Vegetable Special. The traditionally adopted farmers practice *i.e.,* farm yard manure 25 t/ha+ imbalanced use of fertilizer was also included in the trial for assessment. The seeds of Okra hybrid CoBh H1 were treated with the biocontrol agent *Trichiderma viride.* The seeds were raised on beds in a paired row system with spacing of 90 x 60 x 30 cm. Other cultural practices were followed uniformly for all the plots. Various yield parameters *viz.,* days to 50% flowering, number of fruits per plant and yield (q/ha) were recorded from ten plants selected at random in each treatment under seven replications. The benefit cost ratio was also worked out for the individual farmer.

RESEARCH FINDINGS AND DISCUSSION

The average yield performance and economics of five 'on farm trials'of recommended technology and farmers practice was assessed (Table 1). The recommended practice given by TNAU CPG (2013) *i.e.*, *Azospirillum* and phosphobacteria @ 2 kg/ha + farm yard manure 25 t/ha +20:50:30 NPK kg/ha as basal+20 kg N/ha at 30 days after sowing+ IIHR Vegetable Special was evaluated and assessed over KAU CPG (2011) *i.e.,* farm yard manure 12 t/ha +55:35:70 NPK kg/ha as basal+55 kg N/ha at 30 days after sowing+ IIHR Vegetable Special and farmers' practice *i.e.,* farm yard manure 25 t/ha+ imbalanced use of fertilizer.

Minimum number of days to 50% flowering was recorded in TNAU recommended practice (52.0) over KAU (53.4) and farmers adopted practice (55.2). The yield attributing character *i.e.,*number of fruits per plant also registered superiority in TNAU recommended nutrient management practice (71.8) over the practice as suggested by KAU (58.6) and farmers adopted practice (47.6). The yield performance of recommended practice by TNAU CPG (2013) was 274.8 q/ha which was 14.11% higher to KAU (236.0) recommended practice and 16.22% (230.2) higher to farmers practice (Table 1). Evaluation of economics clearly revealed that the net returns from the recommended practice were substantially higher than KAU practice and farmers practice. Cost benefit ratio from recommended TNAU practice were observed to be 3 in comparison to KAU practice (2.79)and farmers' practice (2.78), hence an increase in income of Rs. 1,37,722/-ha was obtained. These benefits can be attributed to the technological intervention provided in on farm trials. Thus, favorable cost-benefit ratio and higher net returns proved the economic viability of the assessed technology and convinced the farmers on the utility of technology

Table 1 : Assessment of integrated nutrient management for various yield and yield attributing characters in Okra Hybrid CoBh H1

Sr. No.	Name and village	Technology option 1				Technology option 2				Technology option 3			
		Days to 50% flowering	No. of fruits/ plant	Yield (q/ha)	BCR	Days to 50% flowering	No. of fruits/ plant	Yield (q/ha)	BCR	Days to 50% flowering	No. of fruits/ plant	Yield (q/ha)	BCR
1.	M. Barnabas, Appattuvilai	55.0	48.0	234.0	2.77	53.0	70.0	268.0	2.97	54.0	62.0	245.0	2.85
2.	S. John Bosco Leelis, Appattuvilai	55.0	51.0	220.0	2.75	52.0	68.0	250.0	2.95	54.0	55.0	230.0	2.76
3.	S. Ponnuswamy, Appattuvilai	56.0	52.0	216.0	2.74	51.0	75.0	295.0	2.89	54.0	58.0	235.0	2.78
4.	S. Sriram, Appattuvilai	55.0	45.0	239.0	2.81	53.0	72.0	275.0	3.05	53.0	58.0	238.0	2.82
5.	A. Krishnakumar, Appattuvilai	55.0	42.0	242.0	2.84	51.0	74.0	286.0	2.98	52.0	60.0	232.0	2.76
	Mean	55.2	47.6	230.2	2.78	52.0	71.8	274.8	3.00	53.4	58.6	236.0	2.79

provided at real farming situation. Similar findings were reported by Mishra *et al.* (2007 and 2014) in onion and cauliflower.

Outcome of the 'on farm trials' organized clearly brings out that the dissemination of assessed technology is feasible, economically viable and environmentally safe for improving yield and to contain the incidence of disease intensity and sucking pest in okra. The assessment could convince on account of its obvious advantages and effective yield and quality improvement of fruits in okra. These innovative practices showed solving the farmers' problem, decision-making and ability to modify their farming practices. On the basis of out come from OFT, assessment of management practices, conducting front line demonstrations (FLD) will enable demonstrate the integrated nutrient management practice for higher yield performance and sustainable economics over farmers practice in Okra Hybrid CoBh H1in Kanyakumari district. Similar work related to the present investigation was also conducted by Anburani and Manivannan (2002); Darley *et al.* (1922) on brinjal, Somkumar *et al.* (1997) and Yadav *et al.* (2006) on okra.

Conclusion :

Integrated nutrient management as per TNAU recommendation increased the fruit yield and quality and reduced the incidence of disease (25.0%) and pest (21.42%) over control. Nutrient management in okra along with the use of bio fertilizers and vegetable special has improved the yield (16.22 %) with TNAU recommendations.The INM based practices were found effective in comparison to conventional methods, so, the above said management practices must be followed by the okra growers. Farmers actively participated in the trial and observed the performance and efficiency of INM practices in okra as recommended by TNAU.

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