



ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2018; 7(7): 75-78
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www.thepharmajournal.com
Received: 12-05-2018
Accepted: 15-06-2018

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Effect of organic and inorganic fertilizers on the plant growth and fruit yield of bittergourd (*Momordica charantia*) variety: Preethi

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Abstract

The present investigation entitled “Effect of organic manures and inorganic fertilizers on plant growth and fruit yield of bitter gourd (*Momordica charantia*) under Allahabad agro climatic conditions “cv. Preethi” was under taken at vegetable research field, Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences (SHUATS), Allahabad during kharif season (2017-2018). The experiment was laid out in Randomized block design with 12 treatments and each replicated thrice. The treatments consist different combinations of micronutrients i.e., urea DAP, MOP, FYM, poultry manure, vermicompost. Among these 12 treatments, treatment T₈ (25% NPK+2tonnes of vermicompost+5 tonnes of poultry manure) was recorded the maximum vine length (236.41), maximum fruit yield per plant(kg)(2.61), maximum weight of fruits (57.77).T₈ is the better treatment combination of applying plant growth and fruit yield of bitter gourd.

Keywords: Bitter gourd, preethi, organic fertilizer, inorganic fertilizer and yield

Introduction

Bitter gourd or balsam pear (*Momordica charantia* L.) is one of the commercially important cucurbitaceous vegetable crops extensively grown throughout the country for its nutritive value and medicinal properties. It is very rich source of calcium, phosphorus, iron, protein, vitamin A and vitamin C. Its juice consumption is also very useful for diabetic patient due to its potent oxygen free radical scavenging activity of the fruit juice (Sreejayan and Rao, 1991). The bitter principle in bitter gourd is cucurbitacin (tetracycline triterpenes) a bitter glucoside which prevents the spoilage of cooked vegetable and keeps fit for consumption even for two to three days (Aykrod *et al.*, 1951). The leaf extract of bitter gourd has also very good mosquitocidal effect (Yadav, 2008). The fruits are prepared for consumption in many ways and are quite commonly used as fried, boiled and stuffed form. Organic farming helps to improve the physical, chemical and biological properties of the soil and maintains the ecological balance as well as productivity of life supporting systems for the future generations. With this background in view, the present investigation was carried out to find the effect of organic nutrients on yield and quality of bitter gourd.

Materials and Methods

An experiment was carried out at vegetable research field, Department of Horticulture, Allahabad School of Agriculture, Sam Higginbottom Institute of Agriculture, Technology and Sciences (SHUATS), Allahabad. During kharif season (2017-18). The experiment was laid out in Randomized block design with 12 treatments and each replicated thrice. The treatments involved were.

Materials

Urea: Urea consist of 46% Nitrogen (N)

DAP (Di Ammonium phosphate): DAP consists 18% of Nitrogen and 48% of phosphorous)

MOP (Murate of Potash): MOP consist of 60% potassium

FYM (farm yard manure): FYM consists 0.5%N, 0.2%P, and 0.5%K

Poultry Manure: Poultry manure consists 3.03%N, 2.63% P, and 1.4%K

Vermicompost: Vermin compost consists N 1.5%N-2.0%and K 1.5-2.5%

Details of Treatment

S. No.	Treatments	Treatment combination
1	T1	Control(RDF)
2	T2	50% recommended dose of fertilizers
3	T3	50% Urea+compost 20 tonnes/ha
4	T4	50% Urea+vermicompost
5	T5	75% DAP+2tonnes of vermicompost
6	T6	75% DAP+10tonnes of vermicompost
7	T7	75% MOP+2.5tonnes of vermicompost+5tonnes of FYM
8	T8	25% NPK+2tonnes of vermicompost+5 tonnes of poultry manure
9	T9	75% Urea+20tonnes of FYM
10	T10	75% MOP+5tonnes of vermicompost
11	T11	100% DAP+Vermicompost2tonnes+5tonnes FYM
12	T12	25% NPK+Vermicompost2tonnes+5tonnes FYM+2 tonnes poultry manure

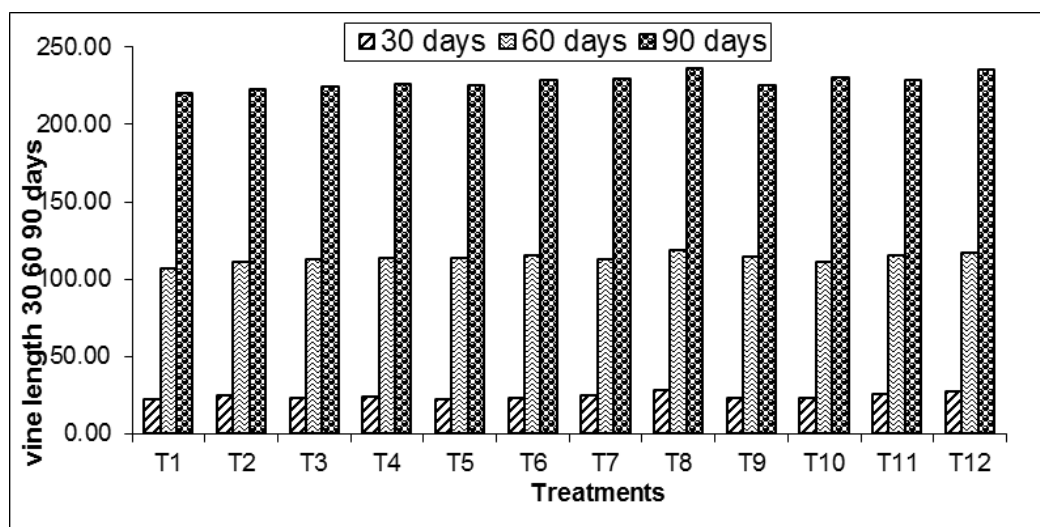
Results and Discussion

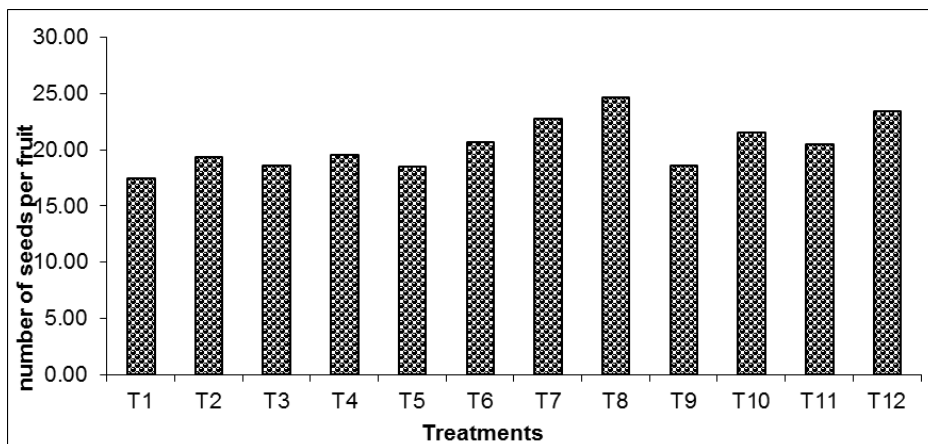
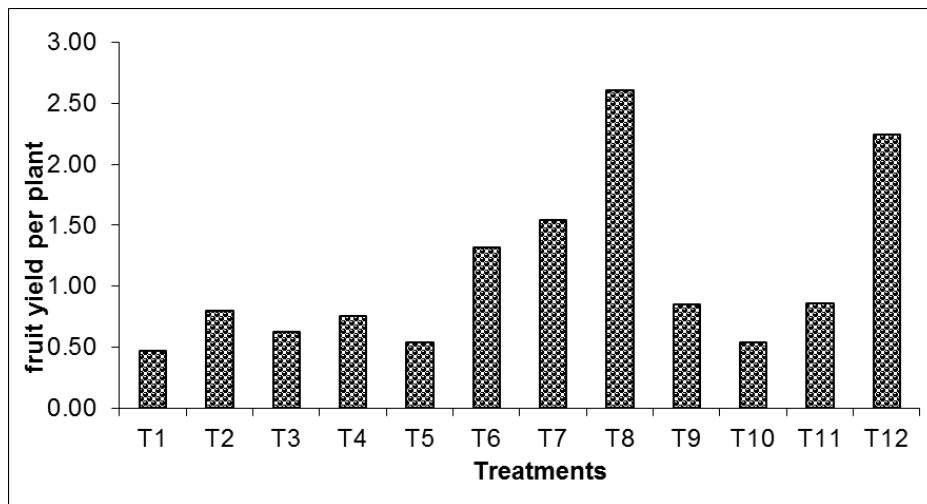
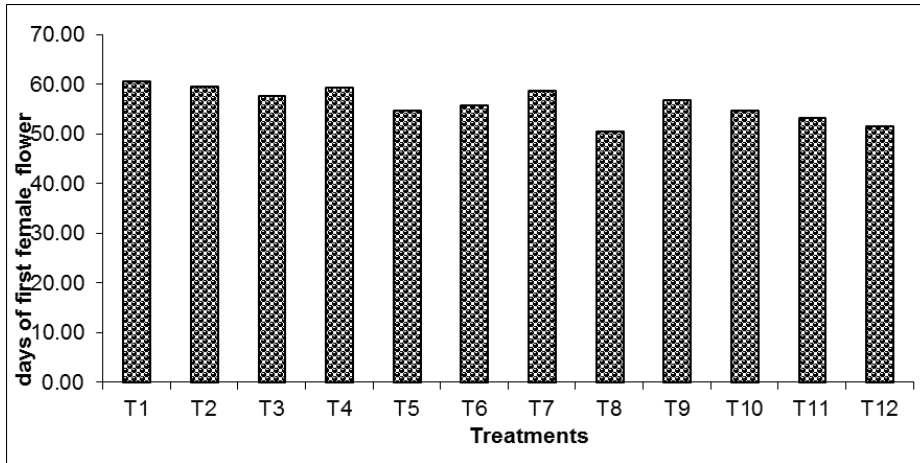
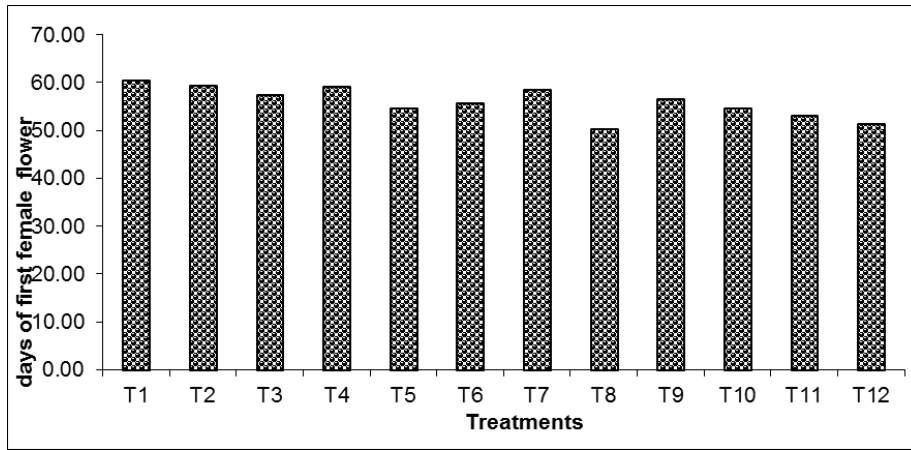
With a view to study the effect of organic and inorganic fertilizer on plant growth and fruit yield of bitter gourd (*Momordica charantia* L.) variety preethi, a field investigation was carried out in the Department of horticulture, Faculty of Agriculture Technology and Sciences Shuats Allahabad during July-October 2017 with 12 treatments combinations under Randomized Block Design and the results are summarized below

The maximum vine length (236.43) was recorded in the treatment T₈ (25% NPK+2tonnes of vermicompost+5 tonnes of poultry manure). The minimum vine length (220.46) was recorded in the treatment T₁(control). The minimum days (50.33) for first female flowering was observed in treatment

T₈ (25% NPK+2tonnes of vermicompost+5 tonnes of poultry manure). The maximum days (60.54) for first female flowering was observed in T₁ (Control) while the other treatments were moderate in their flowering. The maximum fruits length (13.47) was recorded in the treatment T₈ (25% NPK+2tonnes of vermicompost+5 tonnes of poultry manure) The minimum fruits length (8.50) was recorded in the treatment T₁(control). T₈ was found to be the maximum yield of fruits per plant (2.61) followed by T₁₂ (2.21).T₁(Absolute control) registered minimum number of fruits yield per plant (0.47). T₈ was found to be the maximum number of seeds per fruit (24.70) followed by T₁₂ (23.50). T₁ (Absolute control) registered minimum number of seeds per fruit (0.47)

Treatments	Vine length	Days of first female flower appearance	Average fruit length	Fruit yield per plant (kg)	Number of seeds per fruit
T1	220.46	60.54	8.50	0.47	16.54
T2	222.61	59.48	9.51	0.80	19.03
T3	224.64	57.53	9.60	0.62	18.56
T4	226.55	59.27	10.55	0.54	21.67
T5	225.46	54.57	11.45	1.32	21.67
T6	228.73	55.68	10.72	1.55	18.45
T7	229.50	58.56	11.77	2.61	20.34
T8	236.43	50.33	13.47	0.85	24.70
T9	225.50	56.69	11.56	0.54	19.56
T10	230.43	54.63	10.68	0.86	18.53
T11	228.65	53.20	11.54	1.22	22.65
T12	235.62	51.41	12.67	2.45	23.34





Conclusion

Considering the result of the present investigation it may be concluded that treatment combination of T₈(25% NPK+2tonnes of vermicompost+5 tonnes of poultry manure)was found for plant growth and fruit yield of bitter gourd (*Momordica charantia*) with maximum benefit cost ratio (2.80:1). The information obtained from the experiment is helpful to design nutrition programme according to plant growth and fruit yield of bitter gourd.The organic and inorganic nutrients to considered beneficial when growing to support the plant growth and better fruit yield. T₈ is maximum value recorded 25% NPK+2tonnes of vermicompost+5 tonnes of poultry manure these combinations are applied to bitter gourd getting more yield under the agro climatic conditions of Allahabad

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