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RESEARCH PAPER

Role of organic farming on yield and economics of bottle gourd after vegetable pea

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Abstract **:** A study was carried out for three consecutive years during rainy season of 2007 to 2009 at Vegetable Research Station, Kalyanpur, C.S. Azad University of Agriculture and Technology, Kanpur. The main objective was to find out the suitable combination of organic amendment with doses of chemical fertilizers to enhance the bottle gourd production on nutrient deficient soil during rainy season. The summarized results of three years experiment indicate that bottle gourd responded to the application of vermi compost @ 2.5 t+50 per cent RDF, which was registered significantly higher fruits yield (177.52 q/ha) over other nutrients combination. The growth and yield trails noted in bottle gourd under different integrated doses of nutrients were concordant to the fruits yield of bottle gourd. Therefore, integration of vermi compost @ 2.5 t/ha with 50 per cent RDF/ha through chemical fertilizer can be used for higher production of fruits of bottle gourd during rainy season.

Key Words **:** Organic farming, Battle gourd, Vegetable pea, Vermicompost, FYM, Neem cake

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INTRODUCTION

With the continuous application of chemicals since the last green revolution, the soil and its fertility is showing the sign of fatigue and plants developing resistance to insect pests and diseases is breaking down and causing overall pollution to soil and water. Hence, the farmers and consumers are looking for environmentally friendly avenues to overcome this problem and in recent days and organic farming seems to be creating awareness among farmers and consumers alike. Organic farming is one alternative farming system to conventional farming practiced and has scope in appropriate regions. It is a production system in which use of synthetically compounded fertilizers, pesticides, weedicides, growth regulators, live stock feed additives are either avoided are excluded. It stands for commitment to a system of farming that strives balance with nature using methods and materials that have a low impact on the environment. The scientific data on organic farming are scanty but three is a treasure of conventional experience with the farmers which can be used profitably to strengthen organic farming.

According to Veeress (2004), organic farming is farming without chemicals, but this seems to be incomplete because organic farming centers around living systems where the soil, plant and animal including men are bound to wheel of life where the process of growth and the process of decay balance each other. In its most developed form, organic farming is both a philosophy and a system of agriculture which includes all agricultural systems that promotes the environmentally, socially and economically sound production of food and fiber.

MATERIALS AND METHODS

A field trail was conducted for three consecutive years during rainy season of 2007-2008 to 2009-2010 at Vegetable Research Station, Kalyanpur, C.S. Azad University of

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Agriculture and Technology, Kanpur. The soil of the experimental site was loam, having low fertility status. Bottle gourd crop was sown under nine integrated dose of nutrients (T_1 - Full recommended dose of NPK through chemical fertilizers, T_2 - FYM @ 20 t, T_3 - FYM @ 10 t+ half recommended doses of NPK through chemical fertilizers, T_4 - Neem cake @ 1 q, T_5 - Neem cake @ 0.5 q + half recommended doses of NPK through chemical fertilizers, T_6 - Vermicompost @ 5 t, T_7 - Vermicompost @ 2.5 t +half recommended does of NPK through chemical fertilizer, T_8 - Poultry manure @ 5 t and T_9 - Poultry manure @ 2.5t + half reccommended doses of NPK / ha through chemical fertilizers) in RBD with three replications. FYM, neem cake and poultry manure were applied before the twenty five days of bottle gourd planting, while vermicompost was used at the time of bottle gourd plantation. The full doze of NPK was given at sowing. The bottle gourd variety Kalyanpur Long Green was planted in rows at 250 cm apart with 100 cm plants to plants distance. Seeds were seeded on 13 July, 2007, 14 July, 2008 and 13 July, 2009, harvested after edible size of bottle gourd at the end of crop season.

The variances for error were found homogeneous, hence, the pooling of the yield data was done for the three years with standards methods, suggested by Cochran and Cox (1957).

RESULTS AND DISCUSSION

The results discussed below on the basis of pooled year data.

Effect of organic amendment on fruit yield:

Fruit yield of bottle gourd significantly increased with the application of vermi compost @ 2.5 t + 50 per cent RDF / ha (177.52 q/ha- T_7) followed by FYM @ 10 t + 50 per cent RDF /ha (169.32 q/ha -T_3) compared with RDF (157.69 q/ha- T_1). Application of neem cake alone @ 1 q/ha yielded sufficiently lowest bottle gourd fruits which was significantly inferior to all the treatments (Table 1). Integration of neem cake @ 0.5 q with 50 per cent RDF /ha pushed up the fruit yield by a margin of 28.89 q/ha or 21.99 per cent over neem cake alone. Application of poultry manure @ 2.5 t + 50 per cent RDF /ha (T_9) gave fruits of bottle gourd by 162.08 q/ha which was significantly superior in comparison to alone poultry manure @ 5 t/ha (151.52 q/ha).

Application of vermicompost improve the physical condition of soil, increase the activities of soil micro organism and enhance the porosity of soil, which were directly responsible for higher production of bottle gourds fruits (Singh 1999, Singh 1999 and Singh 2000).

Effect of organic amendment on economics:

Rs. 35150/ha incurred on the use of FYM @ 20 t/ha and poultry manure @ 5 t/ha, while Rs 34150/ha invested for application of neem cake @ 1 q/ha and vermicompost @ 5 t/ ha for out boxing of bottle gourd fruits. The investment under other treatments was between these two limits. The highest net return of Rs 23507/ha was found with the use of vermicompost @ 2.5 t+50 per cent RDF /ha followed by application of FYM @ 10 t+ 50 per cent RDF/ha (Rs 22146/ha). The minimum net return of Rs. 5258/ha was received from neem cake @ 1q/ha. Benefit cost ratio was calculated highest under vermicompost @ 2.5 t +50 per cent RDF/ha (1:1.85) closely followed by FYM @ 10 t+50 per cent RDF/ha (1:1.77).

Table 1 : Yield and economics of bottle gourd cultivation (Pooled data of three years)

Sr. No.	Treatments	Pooled mean yield (q/ha)	Cost of cultivation (Rs./ha)	Gross income (Rs./ha)	Net return (Rs./ha)	B :C ratio
1.	T_1 - Full recommended dose of NPK kg/ha through chemical fertilizers	157.69	27150	47307	20157	1:74
2.	T_2 - FYM @ 20 t/ha	152.76	35150	45828	10678	1:30
3.	T_3 - FYM @ 10 t/ha+ Half rec. doses of NPK kg/ha through chemical fertilizers	169.32	28650	50796	22146	1:77
4.	T_4 - Neem cake @ 1 q/ha	131.36	34150	39408	5258	1:15
5.	T_5 - Neem cake @ 0.5 q/ha + Half rec. doses of NPK kg/ha through chemical fertilizers	160.25	30650	48075	17425	1:56
6.	T_6 - Vermi compost @ 5 t/ha	153.03	34150	45909	11759	1:34
7.	T_7 - Vermicompost @ 2.5 t/ ha + Half rec. doses of NPK kg/ha through chemical fertilizer	177.52	28650	53157	23507	1:85
8.	T_8 - Poultry manure @ 5 t/ha	151.52	35150	45456	10306	1:29
9.	T_9 - Poultry manure @ 2.5t/ha + Half rec. doses of NPK kg/ha through chemical fertilizers	162.08	30650	48624	17974	1:58
	C.D. (P=0.05)	11.13	-	-	-	-
	C.V. %	3.59	-	-	-	-

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