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Effect of Vermicompost, Cow Dung and Different Organic Manure Combination on Growth and Yield of Chilli Crop *(Capsicum annuum* L) in India

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Abstract- Field experiments were conducted during 2014 – 2015 on clay loam soil at Shobhit University Gangoh, Saharanpur district, Uttar Pradesh, India, to evaluate the efficacy of Vermicompost on the soil quality characteristics, and on the Growth and yield characteristics of chilli – Capsicum annuum L., in comparison to Cow dung and leave Manure. supplemented with recommended dose of Vermicompost organic fertilizer increased the pore space, water holding capacity, cation exchange capacity, organic carbon, other micro-macro nutrients – Ca, Mg, Na, Fe, Mn, Zn, Cu and microbial population - quality (vitamin A, Vitamin C and Capsaicin content) of chilli was enhanced in the soil. In overall investigations, the obtained results specified that the application of Vermicompost show promising results in the cultivation of chilli and better for obtaining the higher quality chilli and further the cow dung and leave good growth and high yield of chilli crop.

1. Introduction

Chilli (*capsicum annum* L.) is used as vegetable and also condiment but the chief use of chilli throughout the world is as spice on account of its pungency and pleasant flavour. Due to high cost of inorganic fertilizers and residual effects of chemicals there is increasing trends towards organic farming. Which belongs to the family solanaceae? It is a very rich source of vitamins A and C. Due to this; many peasant farmers have resulted to use of organic wastes especially those of livestock's which are abundantly available (Nwajiuba and Chimezie, 2000). Chilli (*Capsicum annuum* L.) is an important solanaceous vegetable crop grown for its unripe-green and ripe-red fruits. Of the many bottlenecks in increasing the fruit production, the occurrence of diseases such as damping of (*Pythium* spp.), leaf and fruit blight (*Phytophthora capsici*), leaf spots (*Alternaria solani*, *Cercospora capsici*) and wilt (*Fusarium* spp.) are noteworthy and considerably reduce the yields (Anonymous, 1993). The reason has been attributed to low demand for and consumption of improved inputs in most developing countries. Most small-scale farmers still rely on crude inputs, land and human labour with less use of chemical fertilizers and improved varieties of crops. The use of fertilizer is reported to be responsible for over 50 percent yield increase in crops. It has been widely accepted that organic farming alone could serve as a holistic approach towards achieving sustainable agriculture as it is nature based, environment friendly and ensures the conservation of resources for the future. The production of hot Capsicum variety is a growing industry in the

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United States because of increased demand for spicy condiments and hot sauce. These chillis are potentially valuable niche crops for small-scale and medium farmers (Gardner and Queeley 1999).

2. Materials and Methods

Field experiments were conducted at the School of Agriculture and Environmental Sciences Shobhit University Gangoh Saharanpur to find out the effect of different organic manures on growth, yield and quality attributes of chilli. The experiments were conducted in a Randomized Block Design replicated twice, in the newly initiated organic farming trial. There were nine treatments involving different organic manures along with no manure control. The different organic manure treatments tried were

T0 No manure control
T_1 Vermicompost @ 2.5 t ha-1
T_2 Cow dung @ 10 t ha-1
T_3 Leaf manure 5tha-1 + cow dung 10 t ha-1
T_4 Leaf manure 5 t ha-1
T_5 Neemcake @ 1 t ha-1
T_6 Vermicompost @ 2.5 t ha-1+ FYM @ 12.5 t ha-1
T_7 Poultry manure 1.5 t ha-1
T_8 Night soil .5 t ha-1

The experimental plots were of size 2.5 x 2.5 m^2 and each plot consisted of size ridges with 20 cm spacing. The soil of the experimental field was clayey loam in texture with pH 7. The biometric observations, on plant height, diameter of stem (cm) number of braches per plant days to flower initiation, days to 50 per cent flowering, days required for first harvesting, number of fruits per plant, length of fruit (cm), breadth of fruit (cm), weight of fruit (g), wet red fruit yield, were recorded. The data of record were subjected to statistical analysis.

3. Results and Discussion

3.1Observation on growth parameters

3.1.1 Plant height (cm) At 30 DAT, maximum plant height was found in T6 (19.2-cm) and minimum was found in T0 (12.34 cm). At 60 DAT maximum average plant height per plant was found in T6 (34.20 cm) and minimum was recorded in T0 (24.13 cm.) and maximum average plant height per plant at 90 DAT was recorded in T6 (42.23cm) and minimum was recorded in T0 (27.22 cm). The increment in plant height with increasing doseVermicompost +FYM application might be better root growth, by **Amirthalingam (1988)** *Effect of organics on growth, yield and biochemical parameters of chilli (Capsicum annum L.)* www.iosrjournals.org 30 | Page

3.1.2 Number of leaves At 30 DAT, maximum number of leaves was found in T6 (25.52 cm) and minimum was found in T0 (14.20 cm). At 60 DAT maximum number of leaves was found in T6 (52.24 cm) and minimum was recorded in T0 (29.13 cm.) and maximum number of leaves at 90

DAT was recorded in T7 (84.22 cm) and minimum was recorded in T0 (45.31 cm). **Sundaravelu et al. (1993)** assessed the effect of seed treatment with Azospirillum and gibberellic acid on the growth and yield of radish.

3.1.3 Number of branches At 30 DAT, maximum average number of branches per plant was found in T6 (6.32 cm) and minimum was found in T0 (3.23 cm). At 60 DAT maximum average number of branches per plant was found in T6 (9.42 cm) and minimum was recorded in T0 (3.82 cm.) and maximum average number of branches per plant at 90 DAT was recorded in T6 (12.75 cm) and minimum was recorded in T0 (4.78 cm). **Amirthalingam (1988)** observed that soil inoculation of Azospirillum along with 50 per cent recommended dose of nitrogen increased the plant height and number of branches in chilli.

3.1.4 Number of flower At 60 DAT there was significant difference in average number of flower per plant the treatments, maximum flower per plant was found in T6 (24.22) and minimum was found in T0 (12.08). Days to flower initiation and 50 per cent flowering were differed significantly due to soil application with FYM 50 per cent + Vermicompost 50 per cent. **Bindiya et al. (2006)**

3.2 Observation on yield parameters

3.2.1 **Number of fruits** at 90 DAT there was significant difference in average number fruits per plant the treatments maximum fruits per plant was found in T6 (16.57) and minimum was found in T0 (9.23). Application of FYM 50 per cent and Vermicompost 50 per cent. Organic manures there by increasing the availability of nutrients, especially protein synthesis further it was suggested that increase in fruit weight might have accelerated the mobility of photosynthetic from source to the sink which was influenced by the growth hormones which released from Vermicompost, the organic source (**Sivakumar et al., 1999 in capsicum**).

3.2.2 Fresh weight (g) of fruit At 90 DAT maximum fresh weight recorded was in T7 (32.86 g) and minimum fresh weight recorded was in T0 (19.52 g). The statistical analysis shows significant. **Paramaguru et al. (1993)** studied the effect of Azospirillum on growth and yield of chilli. Azospirillum + 56 kg N per ha recorded the highest plant height of 56.13 to 57.86 cm.

3.2.3 Dry weight (g) of fruit plant at 90 DAT maximum dry weight recorded was in T6 (16.12g) and minimum dry weight recorded was in T0 (9.32 g). **Dhanapal et al. (1978)** reported that seed inoculated with Azospirillum increased the vigour index and seedling growth. Inoculation of Azospirillum to seed, soil and seedling increased the number of fruits per plant, fresh and dry weights of pod per plant

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The effect of organics on growth parameters on plant height (cm) number of leaves and number of branches of Chilli (Capsicum annum L.) cv: Niharika

Treatment	Plant height (cm)	Number of leaves	Number of Branches
T_0	27.22	45.31	4.78
T_1	36.12	58.34	9.95
T_2	35.36	57.44	7.69
T_3	33.25	58.23	9.63
T_4	29.15	52.25	7.85
T_5	31.51	56.26	8.92
T_6	42.23	84.22	12.75
T_7	34.58	57.21	8.26
T_8	32.45	53.58	7.68

The effect of organics on yield parameters on number of fruit, fresh weight of fruit per plant (g) Dry weight of fruit per plant (g) of Chilli (Capsicum annum L.) cv: Niharika

Treatment	Number of flower	Number of fruit	Fresh weight (g) of fruit	Dry weight (g) of fruit
T_0	12.08	9.23	19.52	9.32
T_1	22.32	14.53	26.35	14.52
T_2	21.25	12.56	25.34	13.57
T_3	22.01	14.25	25.98	14.86
T_4	19.96	12.84	23.56	12.32
T_5	18.35	11.36	24.85	11.84
T_6	24.22	16.57	32.86	16.12
T_7	21.56	13.85	25.84	14.23
T_8	20.24	13.14	23.95	12.53

4. Conclusion

On the basis of experiment conducted, of eight treatments and find out in which T_6 are better them and T_0 lower than others. It is concluded that the effect of organics on growth, yield parameters of chilli (Capsicum annum L.) verity of chilli in Niharika FYM @ (12.5t/ha) + Vermicompost @ (2.5t/ha) showed better results compare to other treatments. If we have implement T_6 treatment in India , so certainly will be reached optimum position .

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