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RESEARCH ARTICLE

EFFECT OF ORGANIC INPUTS ON CERTAIN GROWTH AND FLOWERING CHARACTERS
OF PUMPKIN (*CUCURBITA MOSCHATA* L.) CV.MPH-1

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ABSTRACT

The present investigation was carried out in the form of different experiments to find out the effect of organic inputs on certain growth and flowering characters of pumpkin in the Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalai nagar, Tamilnadu during the year 2012. And it was undertaken with various organic inputs such as FYM (25 t ha⁻¹), Vermicompost (5 t ha⁻¹), Pressmud compost (5 t ha⁻¹), Poultry manure (5 t ha⁻¹), Neem cake (5 t ha⁻¹) and Humic acid (85%) as soil application @50 g ha⁻¹ which comprises 13 treatment combinations including absolute control under Randomized Block Design with three replications. The observations were registered on the following growth and flowering aspects viz., vine length, number of branches plant⁻¹, number of leaves plant⁻¹, leaf area, days to male and female flowering, number of male and female flowers plant⁻¹. The treatments have the significant influence on the above characters and the results revealed that the treatment combination of vermicompost @ 5t ha⁻¹ with concentrated humic acid (85%) as soil application @ 50 g ha⁻¹ was found to be the best with the fruit yield of 29.61 t ha⁻¹.

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INTRODUCTION

Attainment of food sufficiency to provide a healthy life to the human population is perhaps the greatest challenge for the mankind in the 21st century vegetables play a vital role in the health and nutrition of people throughout the world. India is the second largest producer of vegetables in the world next to china with a production of 46 Mt in an area of 4.5 m ha. However, there is a wide gap between the per capita availability of vegetables (285g day⁻¹). The gap is mainly due to low production levels. By the year 2020 A.D. India's population is expected to be one billion requiring more than 110 Mt of vegetables. Hence, in India, with a large vegetarian population, production of vegetables needs to be greatly augmented by the adoption of various technologies. As far as Tamil Nadu is concerned the extent of cultivated land is limited and hence there is a need to exploit the potential of vegetable production extensively through proper cultivation practices, application of chemical fertilizers for the enhancement of crop productivity without depleting soil properties. Proper soil management without impairing soil health is a prerequisite for achieving higher productivity in vegetables cultivating lands. Although, there was enough study on the inorganic and organic inputs, the pumpkin in need to standardize the optimum dose of organic inputs. In recent years it has been realized that higher yields ha⁻¹ in vegetables can be

obtained by application of recommended dose of inorganic nutrients combined with the application of organic nutrients sources like FYM, vermicompost, pressmud, poultry manure, neem cake along with humic acid (Rana, 2004). Farmyard manure plays a vital role in vegetable growing and maintenance of soil health. Also, it has been proved that it enhances the quality aspects and shelf life of vegetables (Singh and Kaloo, 2000). With this above information, the present investigation was carried out with the above mentioned treatments.

MATERIALS AND METHODS

Field experiments were conducted in the vegetable unit, Department of Horticulture, Annamalai University, Annamalai nagar. The Vegetable unit is located 6 Km west to Bay of Bengal at 11°24' N east longitude and at an altitude of ± 5.79 m above MSL. The weather at Annamalai nagar is moderately warm with hot summer months. The mean maximum and minimum temperature are 27.6°C to 37.3°C (with a mean of 31.1°C). The mean annual rainfall is 1,432 mm of which 67 percent is received during North east monsoon (Oct. – Dec.) 24 percent during South west monsoon (July – Sep.) and 9 percent during summer showers. The seeds of pumpkin cv. MPH-1 was collected from Parimal Agri Clinic service at Orathanadu, Tanjore Dist. The organic nutrients were obtained from various sources as given below FYM, Vermi compost, Pressmud compost, Poultry manure and Neem cake was obtained from the orchard, Department of Horticulture, Faculty of Agriculture, Annamalai University. Humic acid was obtained as the granule form from the Victus laboratory, Pondicherry. The experimental area was prepared to a fine tilth and the pits

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of 45 cm³ size were formed with a spacing of 3x3 m. The Treatments were randomly arranged in each replication. The seeds (4 per hill) were sown with the aid of hand hoe. Fifteen days after sowing, thinning was done to maintain 2 healthy plants per pit. The vines are allowed to spread on the soil surface. The organic inputs were applied as mentioned in the treatment schedule and humic acid (85%) granule was given to the crop twice in fortnight interval as soil application. The other cultivation practices were followed as per the recommendation. The collected data were statistically analyzed for getting appropriate results (Panse, and Sukhatme. 1978).

Details of the experiment

Design :Randomized Block Design (RBD)

No. of treatments :Thirteen (13)

No. of replications:Three (3)

RESULTS AND DISCUSSION

Growth characters: The result of the present study showed that there was a significant difference on the growth characters of pumpkin. Among the growth attributes, vine length was influenced by the application of organic inputs. The maximum vine length (434.25 cm) was recorded with the application of vermicompost @ 5t ha⁻¹ along with concentrated humic acid (85%) as soil application @ 50g ha⁻¹. It was followed by the treatment combined with the press mud compost @ 5 t ha⁻¹ with concentrated humic acid (85%) as soil application @ 50 g ha⁻¹ showed the highest favorable added effect on vine length. The positive response on plant height obtained in the present study could be attributed to the catalytic action of vermicompost facilitating better aeration and better drainage by improving the soil physical and biological conditions leading to through deeper penetration of roots and higher nutrient extraction. Enhanced growth achieved due to humic acid might be due to the presence of growth promoters like

Table.1. Effect of organic inputs on vine length , number of primary branches plant⁻¹, leaves plant⁻¹ and leaf area (cm²) in pumpkin (*Cucurbita moschata L.*) cv.MPH-1

Treatment details	Vine length (cm)	Number of primary branches plant ⁻¹	Number of leaves plant ⁻¹	Leaf area (cm ²)
T ₁ – Control	243.01	2.44	18.08	181.56
T ₂ – FYM @ 25t ha ⁻¹	260.91	2.70	19.76	183.31
T ₃ – Enriched FYM @ 15 t ha ⁻¹	277.39	2.95	21.17	185.01
T ₄ – Vermicompost @ 5t ha ⁻¹	335.26	3.74	26.59	189.42
T ₅ – Pressmud compost @ 5t ha ⁻¹	326.82	3.60	25.70	188.75
T ₆ – Poultry manure @ 5t ha ⁻¹	310.34	3.36	24.16	187.26
T ₇ – Neem cake @ 5t ha ⁻¹	293.99	3.13	22.62	185.70
T ₈ – FYM @ 25t ha ⁻¹ +Concentrated humic acid (85%) soil application @ 50g ha ⁻¹	357.86	3.96	27.37	191.12
T ₉ – Enriched FYM @ + Concentrated humic acid (85%) soil application @ 50g ha ⁻¹	368.21	4.19	29.77	192.80
T ₁₀ – Vermicompost @ 5t ha ⁻¹ Concentrated humicacid (85%) soil application @ 50g ha ⁻¹	434.25	5.32	36.58	199.15
T ₁₁ – Pressmud compost @ 5t ha ⁻¹ + Concentrated humicacid (85%) soil application @ 50g ha ⁻¹	417.77	4.71	34.39	197.48
T ₁₂ – Poultry manure @ 5t ha ⁻¹ + Concentrated humicacid (85%) soil application @ 50g ha ⁻¹	413.17	4.14	33.81	196.79
T ₁₃ – Neem cake @ 5t ha ⁻¹ + Concentrated humicacid (85%) soil application @ 50g ha ⁻¹	384.69	4.43	31.31	194.31
SED	7.19	0.10	0.63	0.63
CD (p = 0.05)	14.87	0.21	1.27	1.24

Table 2. Effect of organic inputs on days to first male and female flowering and number of male and female flowers plant⁻¹ in pumpkin (*Cucurbita moschata L.*) cv. MPH-1

Treatments	Days to first male flowering	Days to first female flowering	Number of male flower plant ⁻¹	Number of female flowers plant ⁻¹
T ₁ – Control	52.27	59.34	88.54	10.16
T ₂ – FYM @ 25t ha ⁻¹	49.43	57.30	84.19	10.98
T ₃ – Enriched FYM @ 15 t ha ⁻¹	47.99	55.50	81.28	11.76
T ₄ – Vermicompost @ 5t ha ⁻¹	42.48	48.21	69.88	14.24
T ₅ – Pressmud compost @ 5t ha ⁻¹	43.92	50.10	72.74	13.81
T ₆ – Poultry manure @ 5t ha ⁻¹	45.31	51.90	80.94	13.01
T ₇ – Neem cake @ 5t ha ⁻¹	46.70	53.78	78.41	12.21
T ₈ – FYM @ 25t ha ⁻¹ +Concentrated humic acid (85%) soil application @ 50g ha ⁻¹	41.87	47.67	75.23	15.05
T ₉ – Enriched FYM @ + Concentrated humic acid (85%) soil application @ 50g ha ⁻¹	40.58	49.96	65.72	15.84
T ₁₀ – Vermicompost @ 5t ha ⁻¹ Concentrated humicacid (85%) soil application @ 50g ha ⁻¹	35.55	40.72	55.60	19.27
T ₁₁ – Pressmud compost @ 5t ha ⁻¹ + Concentrated humicacid (85%) soil application @ 50g ha ⁻¹	37.10	42.68	58.59	18.22
T ₁₂ – Poultry manure @ 5t ha ⁻¹ + Concentrated humicacid (85%) soil application @ 50g ha ⁻¹	38.08	43.53	60.24	18.78
T ₁₃ – Neem cake @ 5t ha ⁻¹ + Concentrated humicacid (85%) soil application @ 50g ha ⁻¹	39.14	45.07	62.87	16.65
SED	0.52	0.48	1.24	0.37
CD (p = 0.05)	1.06	0.97	2.49	0.75

substances present in it. It was supported by the findings of Dursun *et al.* (1999) in tomato. These results are concurrent with the findings of Karuppaiah and Kathiravan (2006) and Sureshkumar (2010) in cucurbits vegetables. Application of various organic manures significantly increased the number of branches. Among the different treatments, the treatment plot which received the application of vermicompost @ 5t ha⁻¹ with concentrated humic acid (85%) as soil application of 50g ha⁻¹ recorded the highest number of branches and leaves followed by the treatment combination of pressmud compost @ 5 t ha⁻¹ with concentrated humic acid (85%) as soil application @ 50g ha⁻¹ was applied. The above results were clearly indicated that the application of vermicompost @ 5t ha⁻¹ along with concentrated humic acid (85%) as soil application @ 5g ha⁻¹ performed well when compared to other treatments. This view was supported by the findings of Jasvir Singh (1997) in chilli. The reason for the highest number of branches, number of leaves and leaf area might be due to the synthesis of nitrogen by the microbes in the growth promoter substance of vermicompost. The present observation indicates that vermicompost and humic acid have the essential source of nutrients in a easily available form to the plants (Yawalkar *et al.*, 1981). The favourable effect of vermicompost on number of branches and leaf production as reported by Thanunathan *et al* (2002) in soyabean, Sailajakumari and Ushakumari (2002) in cowpea are in consonance with the findings of the present study.

Flowering attributes: In the present study, the application of vermicompost @ 5 t ha⁻¹ combined with concentrated humic acid @ (85%) as soil application @ 50g ha⁻¹ registered the early appearance of female flowers (40.72 days). This would be due to the better nutritional status of the plant which was favored by the treatment due to more photosynthetic effect and might have the effect of early initiation of flowers. Increased production of leaves plant⁻¹ might help to elaborate more photosynthate and induce flowering stimulus, thus affecting early initiation of flower. Early vigorous growth seen in treatments with organic manures would have helped to synthesize more cytokines by these plants which might have helped to the translocation of these synthesized cytokinin as well as more quantity of available phosphorus through xylem vessels and accumulation of cytokinin and phosphorus in these auxiliary buds would have favored the plants to produced more number of branches plant⁻¹ and by the way more number of female flowers plant⁻¹, and higher fruit set percentage would have been achieved by the plants. This finding was supported by the reports of (Amrithalingam and Balakrishnan, 1988). This results was in consonance with the findings of Nanthakumar and Veeraragavathatham (1998) in brinjal and Virgine tenshia (2003) in tomato.

From the study, it is concluded that the treatment combination of vermicompost @ 5 t ha⁻¹ with concentrated humic acid (85%) @ as soil application @ 50 g ha⁻¹ was found to be the best and it can be followed for the enhancing growth and flowering attributes of pumpkin (*cucurbita moschata L.*) cv. MPH-1.

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