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Integrated Nutrient Management in Cape gooseberry (Physalis peruviana L.) for Peri Urban Horticulture.

KEYWORDS: Vermicompost, biodynamic manures, Cape gooseberry, vegetative parameters, flowers fruiting.

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ABSTRACT *A study was conducted at Horticultural Research Farm in Babasaheb Bhimrao Ambedkar University, Lucknow to assess the effect of organic amendments (bio dynamic materials and organic manures) on vegetative parameters, flowering and fruiting in Cape gooseberry under the peri urban system. The experiment was laid out in C.R.D. with six treatments and four replication. Significant maximum plant height (70.25 cm) was recorded with biodynamic application Jiwamrit (5%) at 60 days after transplanting (DAT) but other vegetative characteristics, bud initiation and fruiting were recorded best with Vermicompost viz. diameter of stem (5.6 cm), number of leaves (81.7), leaf length (13.2 cm) and leaf breadth- (11.3 cm). Bud initiation took 17.50 DAT, first flower opening 24.50 DAT and first fruit set-32.00 DAT. The maximum average number of fruits (7.25) were recorded in T2 (Amritpani 5%) followed by T3 (Jiwamrit 5%) - 6.00 fruits, T5 (Vermicompost) - 5.50 fruits and T4 (FYM) - 5.00 fruits within 60 DAT. The minimum number of average fruits were recorded in T6 (Jiwamrit 5% + Amritpani 5%) -1.50 fruits.*

INTRODUCTION

Cape goose berry (*Physalis peruviana* L.) belongs to family Solanaceous and is a potential underutilized fruit crop which is grown in tropical (as perennial) and subtropical (as annual) regions of the world (Morton, 1987). It is herbaceous in nature and reaches 2 to 3 feet in height under favorable growing conditions. The fruit is a berry with smooth, waxy, orange yellow skin (Lagge, 1974) and is rich in Vitamin A, B_1, B_2, and B_{12} and thus, has potential nutraceutical and pharmaceutical properties (Ramadan and Morsel, 2007). The herbaceous nature of the plant permits its pot cultivation and presence of important bioactive molecules in fruit assign an important nutraceutical potential to the plant because of which it can be suitably exploited for peri urban culture. Since little information is available on the cultivation practices followed in this crop hence, the present investigation was designed with the objective of standardizing the nutrient management practices in Cape gooseberry for peri urban culture.

MATERIALS AND METHOD

The present experiment was conducted at the Horticulture Research Farm Babasaheb Bhimrao Ambedkar University, Lucknow (U.P.). Two month old seedlings of Cape gooseberry were selected for the experiment and were transplanted in earthen pots of ten inch diameter in the month of February 2012. The pot experiment was laid out is CRD with 6 treatments and four replications as per details given below:

T1 – Control (sand: soil: FYM -1:1:1 ratio)
T2 - Amritpani (5%)
T3 - Jiwamrit (5%)
T4 - FYM
T5 - Vermicompost
T6 - Jiwamrit (5%) + Amritpani (5%)

The full dose of organic manure, Vermicompost and FYM was applied at the time of transplanting of seedling. Biodynamic manures Jiwamrit and Amritpani (5%) were applied at the time of transplanting of seedling and subsequently four times at 15 days intervals (15 DAT, 30 DAT, 45 DAT and 60 DAT). Observations were recorded for vegetative characteristics i.e. plant height, diameter of stem, number of leaves, leaf length, leaf breadth, and for bud initiation, flowering and fruiting. The average data was subjected to statistical analysis (Panse and Sukhatme, 1967).

RESULT AND DISCUSSION

A significant effect was observed over control for vegetative performance, bud initiation, flowering and fruiting of Cape gooseberry upon application of the organic amendments. However, a combination of two Jiwamrit (5%) and Amritpani (5%) was found ineffective in improving performance and over all growth and development of the plants was poorer than even control (Table 1 and 2).

It is obvious from data (Table-1) that maximum plant height was observed in T_3 (Jiwamrit 5%), 25.2 cm both at 15 days after transplanting as well as 60 DAT (70.25 cm) which is significantly superior to all the treatments. But for other vegetative parameters *i.e.* diameter of stem (DS), number of leaves (NL), leaf length (LL), leaf breadth (LB), was observed maximum in treatment T_5 (Vermicompost). A similar result was recorded for the different parameters studied 15 days after transplanting and also at 60 DAT (Table-1). A similar response has been observed in strawberry plants (Arancon *et al.* 2004) upon application of Vermicompost. Similarly, flowering was enhanced upon application of Vermicompost (Table-2) but the average number of fruits per treatment was recorded best for biodynamic manure (T_2) followed by application of Jiwamrit 5% (T_3). Similar promotive effects of the biodynamic manures have also been re-

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ported in guava (Ram & Pathak, 2009), tuberose (Singh *et al*. 2007) and carnation (Bhalla *et al*. 2007). These promotive effects are possibly because the biodynamic farming systems are based on the sound principles of soil biotechnology and microbiology harnessing the energies from the cosmos, earth, cow and plants systematically and synergistically were bringing into balance all factors which maintain life (Pathak and Ram, 2004).

It is also noteworthy that since Cape gooseberry is a Solanaceous crop and a close relative of tomato (Morton, 1987) the average number of fruits is low possibly due to low fruit set which occurs under high temperature conditions as is also reported in tomato (Morton, 1987). Thus, this indicates that it is important to standardize the optimum date of sowing in Cape gooseberry in order to harvest a good fruit yield.

Table-1. Vegetative parameters in Cape gooseberry*(Physalis peruviana L.)* at different days after transplanting (DAT).

Treatment	Plant height (cm)		Diameter of Stem(cm)		Number of Leaves		Leaf Length (cm)		Leaf Breadth (cm)	
	15 DAT	60 DAT	15 DAT	60 DAT	15 DAT	60 DAT	15 DAT	60 DAT	15 DAT	60 DAT
T_1	21.75	64.0	1.37	4.5	10.25	75.2	08.30	11.5	06.40	9.1
T_2	20.70	63.2	1.48	4.8	09.75	76.7	08.30	10.3	06.60	8.6
T_3	25.20	70.25	1.59	5.1	10.00	68.0	10.20	12.4	08.40	10.1
T_4	20.25	66.0	1.58	4.3	10.30	80.2	09.60	12.1	08.00	10.0
T_5	24.80	65.5	01.66	5.6	10.70	81.7	10.70	13.2	09.30	11.3
T_6	14.4	61.7	1.21	3.6	08.70	65.7	08.00	10.9	06.20	8.7
CD at 5%	1.232	3.530	0.117	0.171	1.167	4.001	0.732	0.172	0.191	0.148

Table-2. Effect of organic amendments of first bud initiation, first flower opening first fruit set and number of fruits per treatments.

Treatment	Days to first bud initiation	Days to first flower opening	Days to first fruit set	Number of fruit/ plant (average value)
T_1	19.00	27.00	36.70	5.00
T_2	17.70	26.70	34.00	7.25
T_3	20.20	28.20	41.00	6.00
T_4	19.50	25.70	35.70	5.00
T_5	17.50	24.50	32.00	5.50
T_6	29.50	31.70	54.00	1.50
CD at 5%	1.133	1.968	2.318	0.525

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