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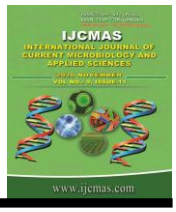

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Effect of Different Organic Manures on Plant Growth and Establishment of Apple Guava

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A B S T R A C T

The experiment was laid out in Randomized Block Design (RBD) with three replication. Revealed that the application T_7 Farm Yard Manure 5kg+Neem Cake 200gm significantly influence the vegetative growth *viz*, plant height (142.74cm), number of leaves plant^{-1} (121.57), number of branches plant^{-1} (10.73), stem length (cm) (18.24), stem girth (cm) (3.50), plant spread (cm) (East – West) (17.89cm), plant spread (cm) (North – South) (18.50), leaf area (29.03cm^2), leaf area index (LAI) (1.45m^2), chlorophyll (a and b) content (mg/g) (3.24 and 2.68).

Introduction

Guava (*Psidium guajava* L.) is one of the most important and commercially cultivated fruit crop belonging to the family Myrtaceae. It is one of the privileged fruits liked by the common masses and is aptly known as "apple of the tropics". Guava is said to have originated in Tropical America (Hayes 1953) and it was introduced in India by the Portuguese during 17th century. Guava is classified under genus *Psidium*, which encompasses 150 species but only *Psidium guajava* has been exploited commercially in terms of commercial success. India is the leading producer of guava in the world and it shares about 45 % of total production of guava in the world. The leading guava producing states in India are Madhya Pradesh, Uttar Pradesh, Maharashtra, Bihar, West Bengal, Gujarat and Karnataka (Anonymous, 2016). Apple guava: are a variety of guava having deep pink color inside instead of the typical white color and an apple red exterior skin. This fruit is sweet, and strongly flavoured with few seeds and is slightly depressed at both ends. The plants are vigorous, dome shaped and compact. These guavas are cultivated across the Allahabad, Uttar Pradesh region in the northern belt of

India. Apple guava is cultivated today on almost 1000 hectares of land mainly under Kaushambi and Kaurihar -II districts of Allahabad[]. The fruit is known for its medical properties such that during the winter season because it neutralizes disease symptoms.

Materials and Methods

The present investigation was carried out to study the "Effect of different organic manures on plant growth, and establishment of apple guava" was conducted under humid subtropical conditions of Uttar Pradesh, District Prayagraj during 2019-2020 at Horticulture Research Farm, Department of Horticulture, Sam Higgibottom University of Agriculture Technology and Science, Prayagraj (U.P.). The experiment was laid out in Randomized Block Design (RBD) with three replication. The experiment of thirteen treatment combination viz., T_0 RDF (60:90:110 kg NPK ha^{-1}), T_1 Farm Yard Manure 10kg, T_2 Vermicompost 5kg, T_3 Poultry Manure 2.5kg, T_4 Goat Manure 5kg, T_5 Leaf Mould 10kg, T_6 Bone Meal 4kg, T_7 Farm Yard Manure 5kg + Neem Cake 200gm, T_8 Vermicompost -7.5kg + Neem Cake 150gm, T_9 Poultry Manure-2.5kg + 100gm Neem Cake, T_{10} Goat Manure-2.5kg + 200gm Neem Cake, T_{11} Leaf Manure 7.5kg + 150gm Neem Cake and T_{12} Bone Meal 2.5kg + 100gm Neem Cake were applied and data were analyzed statistically.

Results and Discussion

A cursory glance over the data depicted in Table 1 clearly shows that the treatments showed significant effect of organic manure on vegetative growth parameters. The highest plant height (142.74cm) was recorded in T_7 Farm Yard Manure 5kg+Neem Cake 200gm the minimum plant height (110.97cm) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}). The maximum number of leaves $plant^{-1}$ (121.57) was recorded in T_7 Farm Yard Manure 5kg + Neem Cake 200gm the minimum number of leaves $plant^{-1}$ (81.08) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}). The maximum number of branches $plant^{-1}$ (10.73) was recorded in T_7 Farm Yard Manure 5kg + Neem Cake 200gm the minimum number of branches $plant^{-1}$ (7.55) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}). The highest stem length (cm) (18.24) was recorded in T_7 Farm Yard Manure 5kg+Neem Cake 200gm the minimum stem length (cm) (14.84) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}). The highest stem girth (cm) (3.50) was recorded in T_7 Farm Yard Manure 5kg+Neem Cake 200gm the minimum stem girth (cm) (2.93) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}). The highest plant spread (cm) (East – West) (17.89cm) was recorded in T_7 Farm Yard Manure 5kg + Neem Cake 200gm the minimum plant spread (cm) (East – West) (15.22) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}). The highest plant spread (cm) (North – South) (18.50) was recorded in T_7 Farm Yard Manure 5kg + Neem Cake 200gm the minimum plant spread (cm) (North – South) (15.66) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}). The maximum leaf area (29.03cm2) was found in treatment with T_7 Farm Yard Manure 5kg+Neem Cake 200gm and the minimum leaf area ($18.61cm^2$) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}). The maximum leaf area index (LAI) ($1.45cm^2$) was found in treatment with T_7 Farm Yard Manure 5kg+Neem Cake 200gm and the minimum leaf area index (LAI) ($1.10cm^2$) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}). The maximum chlorophyll (a and b) content (mg/g) (3.24 and 2.68) was found in treatment with T_7 Farm Yard Manure 5kg+Neem Cake 200gm and the minimum chlorophyll (a and b) content (mg/g) (3.08 and 2.21) was recorded in T_0 RDF (60:90:110 kg NPK ha^{-1}).

Table.1 Effect of different organic manures on vegetative growth of apple guava after transplantation (at 180 days).

Treatment notation	Treatment combinations	Vegetative growth										
		Plant height (cm)	Number of leaves plant^{-1}	Number of branches plant^{-1}	stem length (cm)	stem girth (cm)	plant spread (cm) (E-W)	plant spread (cm) (N-S)	leaf area (cm^2)	leaf area index (LAI)	chlorophyll (a)	chlorophyll (a)
T_0	RDF (60:90:110 kg NPK ha^{-1})	110.97	81.08	7.55	14.84	2.93	15.22	15.66	18.61	1.10	3.08	2.21
T_1	Farm Yard Manure 10kg	128.54	99.89	8.43	16.36	3.31	15.97	17.83	23.59	1.50	3.14	2.74
T_2	Vermicompost 5kg	125.81	99.73	8.31	16.51	3.26	16.11	18.23	24.51	1.30	3.22	2.54
T_3	Poultry Manure 2.5kg	124.47	95.26	8.65	16.28	3.31	15.63	17.63	23.90	1.22	3.20	2.57
T_4	Goat Manure 5kg	123.58	89.25	8.34	15.50	3.18	15.29	17.66	24.91	1.40	3.12	2.65
T_5	Leaf Mould 10kg	118.51	101.60	8.22	15.40	3.32	16.37	17.81	25.55	1.26	3.16	2.50
T_6	Bone Meal 4kg	115.48	96.00	8.28	16.54	3.46	16.40	18.33	27.29	1.43	3.20	2.58
T_7	Farm Yard Manure 5kg+Neem Cake 200gm	142.74	121.57	10.73	18.24	3.50	17.89	**18.50**	29.03	1.45	3.24	2.68
T_8	Vermicompost -7.5kg+Neem Cake 150gm	138.38	115.89	9.63	17.54	3.50	17.34	16.39	27.86	1.30	3.19	2.64
T_9	Poultry Manure-2.5kg+100gm Neem Cake	131.61	113.55	9.57	17.73	3.25	17.29	17.58	25.07	1.37	3.17	2.64
T_{10}	Goat Manure-2.5kg+200gm Neem Cake	128.39	100.07	9.43	17.59	3.35	15.66	17.20	28.40	1.20	3.20	2.59
T_{11}	Leaf Manure 7.5kg+150 Neem Cake	120.31	102.22	8.72	16.69	3.33	16.07	17.65	24.75	1.44	3.17	2.60
T_{12}	Bone Meal 2.5kg+100 Neem Cake	118.41	98.52	8.51	17.51	3.34	16.92	17.98	23.47	1.29	3.18	2.65
	F-Test	**S**	**S**	S	**S**	S	S	S	**S**	**S**	**S**	**S**
	C.D. at 0.5%	**0.981**	**2.795**	0.541	**0.803**	0.247	1.530	0.967	**4.867**	**0.265**	**0.393**	**0.287**
	S.Ed (±)	**0.475**	**1.354**	0.262	**0.389**	0.120	0.741	0.469	**2.358**	**0.129**	**0.190**	**0.139**

The present findings corroborate with those of Athani *et al.,* (2007), Naik and Babu (2007), Ram *et al.,* (2007), Ram and Pathak (2007), Kumar *et al.,* (2007), Dutta *et al.,* (2009), Patel *et al.,* (2009), Shukla *et al.,* (2009), Dwivedi (2013) and Agnihotri *et al.,* (2013) who found that vermicompost with FYM and inorganic fertilizers resulted increase in the vegetative growth.

In conclusion on the basis of the investigation it can be concluded that T_7Farm Yard Manure 5kg + Neem Cake 200gm results as the best treatment combination in terms of vegetative growth parameters showed better results in Prayagraj agro climatic condition However, since this is based on one-year experiment, further trials may be needed to substantiate the results.

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