Indian Journal of Fundamental and Applied Life Sciences ISSN: 2231-6345 (Online)
An Online International Journal Available at http://www.cibtech.org/jls.htm
2012 Vol. 2 (4) October-December, pp.61-65/Suchitra and Manivannan
Research Article

STUDIES ON THE INFLUENCE OF ORGANIC INPUTS ON THE GROWTH AND FRUIT YIELD OF BRINJAL IN VARIOUS SEASONS

[*]S. Suchitra and K. Manivannan
[*]Department of Horticulture, Annamalai University, Tamil Nadu, India
**Author for Correspondence*

ABSTRACT

A field experiment was conducted to study the influence of organic inputs on the yield attributes of Brinjal in various seasons during the years 2007 to 2010. The experiment was laid out in a randomized block design with 14 treatments each replicated thrice. The treatment schedule included organic inputs like, FYM@25t/ha, pressmud 10 t/ha, decomposed coirpith 5t/ha, vermicompost 5t/ha and superimposed by Humic acid and biofertilizer consortium. The results revealed that application of organic inputs have a significant effect on the growth and yield characters of Brinjal. Among the various organic inputs, vermicompost @ 5t/ha with humic acid @ 0.2% foliar spray led the maximum yield in Brinjal.

INTRODUCTION

Brinjal (*Solanum melongena* L) or eggplant is a most popular vegetable crop in India and other parts of the world. It is a poor man's crop vegetable (Som and Maity, 1993). The total area of brinjal under cultivation in India is 4, 79,095 ha (Manmohan Attavar, 2000). In Tamil Nadu it is cultivated in 8,886 ha with an annual production of 1, 15,000 metric tonnes. The annual yield of 13 tonnes per hectare in Tamil Nadu is very low. There is a tremendous scope for increasing it yield to 40 tonnes per hectare. The importance of organic manures has been well recognized in the cultivation of vegetable crops. The role of organic manures is multidimensional, varying from building up of organic matter; good soil aggregation and improving the cation exchange capacity of soil (Gupta, *et al.,* 1983). In the modern dominated by science world agriculture largely depends upon the use of chemical fertilizers as their application, has resulted in spectacular gain in crop productivity. But unfortunately they had an adverse effect on soil fertility and environment. Biofertilizers offer an alternative to chemical inputs to mobilize nutritionally important elements from non-usable form through biological processes (Kumar *et al.*, 2001). Organic manures and their role in enhancing the structural and textural properties of soil have been acknowledged for generations. Besides they add nutrients to the substrate, leading to curtailing total dependence on fertilizers, which involve greater expenditure energy and money (Dahama, 1997). Hence, an attempt was made to study the comparative of Brinjal with organic inputs growth and yield attributes in three seasons.

MATERIALS AND METHODS

A field experiment was conducted in Department of Horticulture, Faculty of Agriculture, Annamalai University during the period 2007-2010 in three seasons. Brinjal var Annamalai was developed by the Department of Horticulture, Faculty of Agriculture, Annamalai University. The experiment was laid out in a randomised block design with 14 treatments each replicated thrice. The treatment schedule included various organic manures and inorganic fertilizer along with a control. Organic inputs used were, FYM@25 t/ha, pressmud@10t/ha, decomposed coirpith @5t/ha, vermicompost @5t/ha and Humic acid on the 30^{th} and the 45^{th} day. Azospirillum @ 2 kg ha^{-1}. Each one was applied separately as well as in combination with Humic acid and Azospirillum. The experiment was carried out in seasons beginning June, November and March each year.

Table 1: Effect of organic inputs in the cultivation of Brinjal in three seasons

		Plant height (45 days)			Plant height (90 days)			Plant height (120 days)			Stem Girth (cm)			No. of Primary Branches		
	Treatments	**Season 1**	**Season 2**	**Season 3**	**Season 1**	**Season 2**	**Season 3**	**Season 1**	**Season 2**	**Season 3**	**Season 1**	**Season 2**	**Season 3**	**Season 1**	**Season 2**	**Season 3**
T_1	FYM 25t/ha^{-1}	73.36	73.14	73.95	71.85	72.12	73.21	80.54	83.36	81.32	2.32	2.38	2.33	5.83	6.00	6.00
T_2	PM 10t/ha^{-1}	74.14	74.38	74.64	71.98	73.17	74.89	82.51	85.13	84.11	2.45	2.39	2.60	5.94	6.06	6.86
T_3	D.C. 5t	75.53	75.59	75.62	73.54	75.35	75.64	84.45	85.35	85.45	2.56	2.45	2.76	6.14	7.14	7.09
T_4	V.C. 5t	78.36	78.94	78.99	76.32	76.84	79.83	87.36	87.56	89.78	2.62	2.59	2.83	6.26	7.85	7.19
T_5	T_1 + H.A.	81.85	81.98	82.06	80.95	82.91	85.90	91.48	93.06	92.38	3.12	2.78	3.00	7.00	8.97	8.29
T_6	T_2 + H.A.	83.36	84.47	84.98	84.79	82.58	92.83	95.54	95.84	92.93	3.18	3.15	3.15	8.18	10.04	11.40
T_7	T_3 + H.A.	87.54	88.93	88.99	90.95	94.54	94.36	96.52	98.39	98.56	3.45	3.24	3.49	9.19	11.54	12.38
T_8	T_4 + H.A.	91.78	92.84	93.96	96.98	99.18	100.16	100.58	101.69	103.16	5.02	4.95	4.98	12.86	13.99	14.19
T_9	T_1 + Biofer	79.85	79.94	79.16	77.54	81.91	83.63	92.04	91.36	90.93	2.73	2.62	2.83	6.84	8.64	8.21
T_{10}	T_2 + Biofer	82.32	82.48	82.75	81.83	79.89	92.73	95.39	95.56	93.00	3.12	2.72	3.01	17.83	9.00	11.19
T_{11}	T_3 + Biofer	85.78	86.38	87.04	87.88	93.28	93.60	96.32	96.04	96.55	3.21	3.21	3.26	8.69	10.32	12.18
T_{12}	T_4 + Biofer	89.76	90.88	91.11	93.38	97.79	97.36	97.96	99.68	99.92	3.78	3.69	3.60	9.64	12.67	12.80
T_{13}	Inorganic NPK	73.06	72.84	72.99	71.69	69.24	70.61	80.36	83.19	81.00	2.14	2.27	2.27	5.23	5.97	5.98
T_{14}	Control	71.04	70.54	71.86	71.54	68.25	69.83	80.04	80.32	79.49	2.05	2.14	2.17	5.16	5.64	5.89
SEd	SEd	0.6069	0.6764	0.5577	0.7111	0.5915	0.8954	0.5668	0.6422	0.6272	0.1095	0.1244	0.0448	0.1592	0.4578	0.1543
C.D.	C.D.	1.2502	1.3934	1.1489	1.4649	1.2184	1.8445	1.1676	1.3228	1.2920	0.2255	0.2562	0.0922	0.3280	0.9430	0.3178

FYM – Farmyard Manure, VC – Vermicompost, DC – Decomposed Coirpith, PM – Pressmud, H.A. – Humic Acid, Biofer – Biofertilizer

	Treatments	No. of fruits / plant			Length of the Fruit (cm)			Girth of the Fruit (m)			No. of Secondary Branches			No. of leaves plant^{-1}		
		Season 1	Season 2	Season 3	Season 1	Season 2	Season 3	Season 1	Season 2	Season 3	Season 1	Season 2	Season 3	Season 1	Season 2	Season 3
T_1	FYM 25t/ha^{-1}	10.64	7.14	12.01	6.15	7.62	8.36	7.10	6.18	7.34	9.12	9.74	9.81	57.69	52.97	61.67
T_2	PM 10t/ha^{-1}	10.94	7.39	12.04	6.37	7.65	8.48	7.17	6.84	7.95	9.34	9.83	10.19	58.59	54.32	61.33
T_3	D.C. 5t	11.49	7.34	12.14	6.45	8.00	8.43	7.24	7.16	8.00	9.65	9.87	11.54	63.32	57.15	62.00
T_4	V.C. 5t	11.65	7.96	13.02	6.79	8.11	8.50	8.12	7.24	8.07	9.74	10.00	11.87	63.51	59.17	62.67
T_5	T_1 + H.A.	12.39	11.98	14.04	9.34	8.25	9.50	8.15	8.16	9.34	10.00	10.39	12.19	64.19	58.94	65.67
T_6	T_2 + H.A.	16.39	16.39	19.72	10.24	9.12	10.28	9.45	8.75	9.86	10.39	10.67	12.61	69.54	65.19	68.33
T_7	T_3 + H.A.	18.79	17.57	26.79	10.54	10.95	11.33	12.14	11.92	11.29	8.98	12.97	13.67	75.64	74.15	77.67
T_8	T_4 + H.A.	28.64	30.11	21.84	12.78	13.97	14.30	12.79	13.75	12.12	13.95	13.98	13.99	87.39	89.17	94.33
T_9	T_1 + Biofer	11.79	12.32	13.74	9.34	8.50	8.50	8.95	8.05	8.31	9.87	10.14	12.00	62.36	59.13	63.00
T_{10}	T_2 + Biofer	15.74	17.47	18.24	10.21	9.00	10.18	9.24	8.45	9.41	10.14	10.54	12.49	65.13	63.74	66.33
T_{11}	T_3 + Biofer	16.54	17.47	20.04	9.34	10.95	11.33	10.25	9.85	10.99	12.79	10.84	12.91	70.19	66.14	71.00
T_{12}	T_4 + Biofer	20.79	22.76	24.50	10.42	12.65	13.43	12.19	17.75	11.60	11.08	12.67	12.40	83.19	81.77	87.00
T_{13}	Inorganic NPK	10.56	7.00	10.42	6.00	7.24	8.24	7.00	6.05	7.23	8.79	9.59	9.46	57.00	52.35	58.33
T_{14}	Control	10.11	7.00	10.07	6.00	7.15	8.14	7.00	6.00	7.08	8.54	9.11	9.19	48.39	48.56	52.33
SEd	SEd	0.71	0.84	0.90	0.70	0.55	0.77	0.38	0.41	0.45	1.3964	2.0021	1.7572	1.75	2.29	2.34
C.D.	C.D.	1.42	1.69	1.81	1.41	1.10	1.55	0.78	0.84	0.91	2.8704	4.1155	3.6121	3.51	4.59	4.67

FYM – Farmyard Manure, VC – Vermicompost, DC – Decomposed Coirpith, PM – Pressmud, H.A. – Humic Acid, Biofer – Biofertilizer

	Treatments	Weight of Fruit (gm)			Yield per plant (kg)			Yield per plot (kg)			Estimated yield / ha (t)		
		Season 1	Season 2	Season 3	Season 1	Season 2	Season 3	Season 1	Season 2	Season 3	Season 1	Season 2	Season 3
T_1	FYM 25t/ha^{-1}	29.12	27.34	30.08	0.39	0.51	0.62	23.4	30.9	37.3	10.85	11.06	12.02
T_2	PM 10t/ha^{-1}	29.45	30.14	31.87	0.45	0.53	0.63	27.0	32.1	38.3	11.03	11.12	12.08
T_3	D.C. 5t	33.78	30.45	34.57	0.61	0.65	0.72	36.6	39.3	43.3	11.14	11.68	12.49
T_4	V.C. 5t	34.12	36.82	35.34	0.65	0.68	0.75	39.9	40.5	45.1	11.92	12.88	12.63
T_5	T_1 + H.A.	37.24	39.49	37.09	0.81	0.82	0.95	48.9	53.4	57.0	13.94	13.26	13.75
T_6	T_2 + H.A.	43.17	44.84	47.35	0.99	1.13	1.26	59.4	68.1	75.7	14.35	14.62	14.48
T_7	T_3 + H.A.	55.15	52.23	52.00	1.08	1.23	1.29	64.9	77.5	77.7	15.26	16.20	15.77
T_8	T_4 + H.A.	59.16	60.42	61.65	1.56	1.51	0.94	94.3	94.8	116.7	22.64	21.46	21.60
T_9	T_1 + Biofer	36.82	35.74	37.00	0.80	0.87	1.08	48.3	52.5	64.8	11.96	13.94	12.75
T_{10}	T_2 + Biofer	42.34	41.92	43.80	0.86	0.95	1.27	51.8	57.0	76.5	14.16	13.28	13.98
T_{11}	T_3 + Biofer	51.43	52.17	50.50	1.03	1.17	1.37	61.8	70.7	82.6	15.24	15.68	15.77
T_{12}	T_4 + Biofer	58.75	59.90	60.42	1.25	1.35	0.48	74.8	81.0	26.2	17.24	17.26	16.95
T_{13}	Inorganic NPK	27.34	28.92	28.86	0.35	0.35	0.48	21.1	21.4	26.2	10.65	10.62	11.08
T_{14}	Control	23.56	20.45	22.18	0.30	0.32	0.45	18.00	19.5	26.1	9.24	9.65	9.45
SEd	SEd	0.84	0.94	1.05	0.01	0.01	0.19	0.60	0.52	0.43	0.4024	0.4024	0.4638
C.D.	C.D.	1.73	1.94	2.11	0.0.	0.0.	0.08	1.20	1.05	0.85	0.8271	0.8271	0.9534

FYM – Farmyard Manure, VC – Vermicompost, DC – Decomposed Coirpith, PM – Pressmud, H.A. – Humic Acid, Biofer – Biofertilizer

RESULTS AND DISCUSSION

Application of organic inputs had a significant effect on the growth and yield of Brinjal. Highest growth yield attributes and highest fruit yield (1572.00 kg/plot) were obtained due to the application of organic inputs. Among the various organic manures tested, application of vermicompost @ 5t/ha and Humic Acid 0.2% followed by T_{12} recorded the highest fruit yield (1572.00) kg plot^{-1}, no. of fruits plant^{-1} (30.11), length of fruits (14.30) girth of fruits (13.75). This might be due to the application of vermicompost along with foliar spray which excelled all the other treatment. The increased plant height may be due to vermicompost in increasing the availability of in the plant system and thereby increasing plant growth as reported by Warner *et al.,* (2004). According to Kale *et al.,* (1987) vermicompost acts as a good medium for the growth and development, and increases in the soil and make the nutrients available for uptake by plants. This is mainly due to the supplementation of organic nitrogen, phosphorous and potassium along with making available micro nutrients with vermicompost and foliar spray, they provide the major inorganic nutrients besides the supplementation of micronutrients in the first, second and third seasons respectively. This is in agreement with the reports of Palaniappan *et al.,* (1979) regarding chillies and tomato. The next best results were obtained in (T_{12}), Decomposed coirpith 5t/ha and Biofertilizer. Better quality produce by the application of organic manures is due to the availability of plant nutrients including the secondary and micronutrients availability and also growth these are not usually supplied by chemical fertilizers (Kumaraswamy, 2004). Moreover it is a fact that the soil microbes are the entities, which give life to the soil. They proliferate in humus and cause, ionic degradation which releases elements needed for plant growth. Soil application of organic manures and Biofertilizers will result in remunerative production of Brinjal.

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