



Influence of Organic Inputs on Growth and Yield Attributes of *Aloe vera* (L.)

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ABSTRACT

The experiment on "Influence of organic inputs on the growth and yield of *Aloe vera* L." was conducted at the Department of Horticulture, Annamalai University, Annamalai Nagar, Chidambaram. Application of organics as per treatments viz., FYM @ 1.25, 2.50 and 3.75 kg per plant; press mud @ 1.25, 2.50 and 3.75 kg per plant; decomposed coir pith @ 1.25, 2.50 and 3.75 kg per plant and vermicompost @ 0.50 and 1.0 kg per plant were made before planting of *Aloe vera* suckers. Among the organics, FYM @ 2.5 kg per plant significantly increased the growth of *Aloe vera*. Maximum number of suckers per plant was recorded in FYM @ 1.25 kg per plant. FYM @ 2.50 kg/plant significantly increased the yield attributes viz., total juice and gel weight, whereas vermicompost @ 0.5 kg/plant had shown maximum gel weight. Maximum latex content with aloin in the leaves was significantly increased by the application of FYM @ 1.25 kg/plant. It was concluded that FYM @ 2.5 kg per plant is the best treatment in improving the growth and yield (30.43 tonnes/ha) of *Aloe vera*, to be grown with organic inputs.

Key words : *Aloe vera*, Growth, Organics, Yield.

Aloe vera (L.) one of the important medicinal plant belonging to the family *Liliaceae*, is the main source of the drug aloe. Aloe and Aloin are extensively used as active ingredients in laxative and anti-obesity preparations. Organic cultivation is a conventional method without the use of chemicals and it keeps the soil alive and in good health without affecting the growth of the plants. Quality of the medicinal plants was improved, when they are grown organically as organic inputs are available in enormous quantity as biological waste. Use of organics (FYM, pressmud, decomposed coir pith and Vermicompost) for increasing the production is emphasized because continuous use of chemical fertilizers had led to several hazards in soil by heavy withdrawal of nutrients and caused deficiency of micronutrients and nutrient imbalance which ultimately resulted in reduction of crop yield. Keeping this in view, the present investigation was taken up to study the effectiveness of utilization of organics in the cultivation of *Aloe vera* (L.).

MATERIAL AND METHODS

The experiment was conducted at the Department of Horticulture, Annamalai University, Chidambaram during 2003-2004 with Randomized Complete Block Design, replicated thrice. Organics were incorporated in soil before planting. Observations were recorded on five plants per treatment in each replication and the mean data were analyzed statistically.

Treatments:

- T1- FYM @ 1.25 Kg per plant
- T2- FYM @ 2.50 Kg per plant
- T3- FYM @ 3.75 Kg per plant
- T4- Press mud @ 1.25 Kg per plant
- T5- Press mud @ 2.50 Kg per plant
- T6- Press mud @ 3.75 Kg per plant
- T7- Decomposed coir pith @ 1.25 Kg per plant
- T8- Decomposed coir pith @ 2.50 Kg per plant
- T9- Decomposed coir pith @ 3.75 Kg per plant
- T10- Vermi compost @ 0.50 Kg per plant
- T11- Vermi compost @ 1.0 Kg per plant
- T12- Control (sand alone)

RESULTS AND DISCUSSION

Growth attributes :

The different growth attributes viz., plant height (47.80 cm at 240 days), number of leaves per plant (13.51 at 240 days) and plant spread (42.98 cm N-S and 46.86 cm E-W at 240 days) were found to be significantly increased by application of Farm Yard Manure @ 2.50 Kg per plant (T2) (Table-1). Earlier studies by Bhaskar *et al.* (2001) observed that the application of 30 tons of FYM ha had produced significantly higher number of shoots (58.7 and 53.4) in the third and fourth harvestings, respectively in scented *Geranium*. According to Selvaraj *et al.* (2003), application of organic inputs (FYM @ 25 ton per hectare, biodynamic compost @ 5 tons per hectare, neem cake @ 5 tons per

hectare, *Azospirillum* and phosphobacteria @ 2 kg per hectare) and foliar spraying of panchagavya (3 % at monthly interval) on Rosemary recorded increased plant height, number of bunches and number of leaves per bunch. Khanna *et al.*, (1975) reported that addition of FYM increased the soil organic carbon by 0.03 per cent and improved the physical properties of the soil. Flaig (1982) stated that addition of organic matter not only acted as a source of nutrients but also improved their quantum of availability. Khiani and More (1984) observed that manuring with FYM appreciably improved the soil physical properties as well as chemical properties like available nitrogen, phosphorus and potassium. Singh and Dhar (1986) noticed that the total carbon content and water holding capacity of soil was also increased with addition of manures. Ethrig and Statis (1989) noticed that addition of organic manures improved the soil structure through increasing total pore space.

Yield attributes:

The maximum number of suckers per plant (5.32) was recorded in FYM @ 1.25 kg per plant

(T1) (Table -2). Increase in the number of suckers with FYM and decomposed coir pith media might be due to the improved aeration and water holding capacity in composted coir pith besides supplementing and effective utilization of the plant nutrients leading to increased yield. Addition of larger quantity of organic manures provided sufficient quantity of carbonaceous materials for decomposition by microorganisms and converting them into mineralized organic colloids besides adding them to soil reserves as reported by Sharma and Mitra (1998). Application of FYM @ 2.50 kg per plant had shown beneficial effects on the plant yield per hectare and this is in accordance with the findings of the Bhaskar *et al.* (2001) who reported that application of 30 tons FYM significantly increased the herbage yield (34.4 and 17.9 tons per hectare) in the third and fourth harvestings, respectively in Scented *Geranium*. Anwar *et al.* (2001) reported that herbage and oil yield was increased due to the application of gypsum and FYM @12 tons per hectare in Mentha. Increase in the yield was mainly because of improvement in soil properties and available plant nutrients.

Table 1. Influence of organic inputs on the growth of *Aloe vera* (L.)

Treatments	Plant height (cm)		N-S Plant spread (cm)		E-W Plant spread (cm)		No.of leaves/plant	
	120 DAP	240 DAP	120 DAP	240 DAP	120 DAP	240 DAP	120 DAP	240 DAP
T ₁	32.14	47.80	29.01	42.98	32.62	46.86	9.03	13.51
T ₂	42.30	55.20	35.09	49.66	39.02	52.49	10.96	15.06
T ₃	27.32	42.50	26.85	39.08	29.93	42.01	8.03	12.03
T ₄	25.31	40.31	19.85	33.92	18.83	32.05	7.93	11.96
T ₅	28.56	45.35	28.98	41.02	30.02	43.69	9.93	14.03
T ₆	22.50	35.61	23.91	35.84	22.91	36.92	6.98	11.83
T ₇	23.81	38.91	24.01	37.06	15.82	39.52	8.38	12.23
T ₈	35.90	53.40	33.01	46.09	37.82	50.31	8.83	13.03
T ₉	20.22	33.91	23.62	36.92	24.92	38.01	8.00	12.66
T ₁₀	33.15	50.80	30.53	44.92	34.86	48.62	9.09	13.86
T ₁₁	20.56	33.31	18.63	32.92	22.06	35.22	6.99	11.02
T ₁₂	20.32	32.19	17.63	31.52	16.84	29.02	6.03	9.04
General mean	27.67	42.44	25.92	39.32	27.13	41.23	8.35	12.52
SEm±	0.67	0.90	0.46	0.49	0.71	0.52	1.30	0.52
CD (P=0.05)	1.30	1.82	0.95	1.00	1.43	1.05	2.62	1.06

DAP = Days after planting

Table 2. Effect of organics on the yield and quality of gel in *Aloe vera* (L.)

Treatments	No. of Sukers plant ⁻¹	Plant yield hectare ⁻¹ (tonnes)	Total Juice plant ⁻¹ (ml)	Dry gel weight plant ⁻¹ (gm)	Juice without gel plant ⁻¹ (ml)	Latex content with aloin plant ⁻¹ (gm)	Dry weight of aloin plant ⁻¹ (gm)
T ₁	5.32	27.08	984.32	227.28	440.32	47.66	22.86
T ₂	3.41	30.43	1213.20	250.57	456.65	46.38	16.93
T ₃	1.86	25.75	795.49	170.09	542.68	34.65	11.83
T ₄	3.16	24.85	649.28	136.28	403.29	36.86	9.25
T ₅	2.59	26.20	984.94	213.19	614.12	36.12	14.08
T ₆	2.09	24.26	706.21	149.42	564.16	35.45	9.62
T ₇	3.84	23.29	775.47	166.04	546.75	32.14	11.26
T ₈	2.64	28.58	1017.86	205.06	466.08	43.62	16.82
T ₉	1.26	23.10	717.08	152.39	586.79	31.59	10.68
T ₁₀	3.39	27.48	1062.51	243.26	527.43	47.43	20.73
T ₁₁	2.30	22.69	564.39	118.24	443.52	27.88	8.63
T ₁₂	1.10	21.53	437.81	91.68	257.98	19.90	6.95
General mean	2.74	25.44	825.71	176.96	487.56	36.64	13.30
SEm±	0.67	0.08	1.28	1.71	1.01	0.64	0.48
CD (0.05) %	1.38	0.18	2.58	3.45	2.03	1.28	0.97

The results revealed that the application of FYM @ 2.50 kg per plant (T₂) significantly increased the total juice per plant. Vermicompost @ 0.50 kg per plant significantly increased dry gel weight per plant and FYM @ 1.25 kg per plant significantly increased the latex content with aloin and dry weight per plant. Application of vermicompost may be attributed to the high level of nutrients besides some growth stimulating substances. Senapati *et al.* (1984) also reported that vermicompost is a very important biofertilizer that can be used in the field for increasing crop production.

Summary:

Application of Farm Yard Manure @ 2.50 kg per plant or decomposed coir pith @ 2.50 kg per plant, vermicompost @ 0.50 kg per plant significantly increased the growth parameters of *Aloe vera*. Application of FYM @ 1.25 Kg per plant (T₁) showed the maximum number of suckers per plant. Vermicompost @ 0.50 kg per plant increased dry gel weight per plant. FYM @ 1.25 kg and 2.50 kg per plant showed the maximum juice content and latex content in the *Aloe vera* (L.).

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