



E-ISSN: 2278-4136

P-ISSN: 2349-8234

[www.phytojournal.com](http://www.phytojournal.com)

JPP 2020; 9(6): 1587-1588

Received: 26-08-2020

Accepted: 29-09-2020

**Vishnu Prasad Patidar**

Department of Forest Products and Utilization, College of Horticulture and Forestry, Jhalrapatan City, Jhalawar, Rajasthan, India

**Bhuvnesh Nagar**

Department of Forest Products and Utilization, College of Horticulture and Forestry, Jhalrapatan City, Jhalawar, Rajasthan, India

**PS Chauhan**

Department of Forest Biology and Tree Improvement, College of Horticulture and Forestry, Jhalrapatan City, Jhalawar, Rajasthan, India

**Kanica Chauhan**

Department of Forest Products and Utilization, College of Horticulture and Forestry, Jhalrapatan City, Jhalawar, Rajasthan, India

**Anju S Vijayan**

Department of Forest Products and Utilization, College of Horticulture and Forestry, Jhalrapatan City, Jhalawar, Rajasthan, India

**SBS Pandey**

Department of Silviculture and Agroforestry, College of Horticulture and Forestry, Jhalrapatan City, Jhalawar, Rajasthan, India

**Rajendra Kumar Nagar**

Department of Forest Products and Utilization, College of Horticulture and Forestry, Jhalrapatan City, Jhalawar, Rajasthan, India

**Corresponding Author:****Vishnu Prasad Patidar**

Department of Forest Products and Utilization, College of Horticulture and Forestry, Jhalrapatan City, Jhalawar, Rajasthan, India

## Effect of organic manures on growth performance of *Aloe barbadensis* Mill. in Semi-arid region of Rajasthan

**Vishnu Prasad Patidar, Bhuvnesh Nagar, PS Chauhan, Kanica Chauhan, Anju S Vijayan, SBS Pandey and Rajendra Kumar Nagar**

**Abstract**

The present investigation was conducted to assess the significant influence of different doses of organic manures on the growth performance of *Aloe barbadensis* in Semi-arid Region of Rajasthan. The experiment was laid using RBD with three replications during July 2019 to March 2020 at the Herbal garden of College of Horticulture & Forestry, Jhalrapatan, Jhalawar. A total 12 different level of organic manures were used as treatments. The results of the study revealed that plants treated with FYM @ 10 t/ha + Vermicompost @ 5 t/ha performed superior followed by FYM @ 7.5 t/ha + Vermicompost @ 5 t/ha. Therefore it is concluded that best growth performance indirectly favor the production of the gel and latex used in cosmetic and nutraceuticals industries.

**Keywords:** *Aloe barbadensis*, FYM, growth, semi-arid region, vermicompost

**Introduction**

*Aloe* genus is belong to family Liliaceae, consists of about 300 species. It is a hardy perennial tropical plant, can be cultivated in drought prone areas. Plant is indigenous to eastern and southern Africa, also cultivated in Europe, India including northwest Himalayan region (Mukesh *et al.*, 2010) [5]. In India, it is scattered in the wild, along the coast of southern India. Among species of *Aloe*, *Aloe barbadensis* the most commonly grown in the world and it is considered as an important medicinal plant also (Hazrati, 2012) [3]. Now a days the demand of *Aloe spp* is increasing amongst cosmetic and nutraceuticals markets. The cultivation of *Aloe* has acquired great commercial importance for medicinal products and cosmetics processing and expanding day by day in the area as it provides quick and regular income to the farmers but information are scarce about agronomic management, commercial use, standardized and low cost processing techniques of this crop.

Application of organic manures gives better results than chemical fertilizer in term of growth and yield of *Aloe vera* (Saha *et al.*, 2005) [6]. The Manuring practices followed by farmers vary widely in different areas due to limited availability of literature on area specific recommended doses of different manures. Hence, by considering theses, the present study was carried out to assess the effect of organic manure on the growth performance of *Aloe barbadensis* in Semi-arid region of Rajasthan.

**Materials and Methods**

The experiment was conducted at Herbal garden of College of Horticulture and Forestry, Jhalrapatan city, Jhalawar during 2019-2020. The region is dominated by black soil of the clay loam type with adequate drainage facility. The average rainfall is 851mm per year. More than 90 per cent of rainfall is received during mid-June to September with scanty showers during winter months.

A field experiment was laid using RBD with three replications. A total 12 different level of organic manures were used as a treatment *viz.* T<sub>0</sub> - Control (Soil only), T<sub>1</sub> - FYM @ 5 t/ha, T<sub>2</sub> - FYM @ 7.5 t/ha, T<sub>3</sub> - FYM @ 10 t/ha, T<sub>4</sub> - Vermicompost @ 2.5 t/ha, T<sub>5</sub> - Vermicompost @ 5 t/ha, T<sub>6</sub> - FYM @ 5 t/ha + Vermicompost @ 2.5 t/ha, T<sub>7</sub> - FYM @ 5 t/ha + Vermicompost @ 5 t/ha, T<sub>8</sub> - FYM @ 7.5 t/ha + Vermicompost @ 2.5 t/ha, T<sub>9</sub> - FYM @ 7.5 t/ha + Vermicompost @ 5 t/ha, T<sub>10</sub> - FYM @ 10 t/ha + Vermicompost @ 2.5 t/ha, T<sub>11</sub> - FYM @ 10t/ha + Vermicompost @ 5 t/ha.

The following growth parameters were measured at harvest (8 month after planting) such as plant height, leaf length, leaf width, leaf thickness, number of leaves per plant and number of suckers per plant.

## Results and discussion

Results of present study revealed that plant height, leaf length, leaf width, leaf thickness and number of leaves per plant was significantly influenced by addition of organic manures except number of suckers per plant was found non-significant as presented in table 1.

Highest plant height (54.67 cm) was recorded in treatment T<sub>11</sub> and it was found statistically at par with T<sub>9</sub> (52.87 cm) whereas lowest plant height was in treatment T<sub>0</sub> (43.07 cm). Treatment T<sub>11</sub> showed significantly maximum leaf length (52.04 cm) and it was found statistically at par with T<sub>7</sub> (48.73 cm), T<sub>8</sub> (48.78 cm), T<sub>9</sub> (50.83 cm) and T<sub>10</sub> (49.62 cm). Treatment T<sub>0</sub> showed the lowest leaf length (41.89 cm).

Maximum leaf width (7.89 cm) was recorded in treatment T<sub>11</sub> followed by T<sub>9</sub> (7.34 cm), T<sub>7</sub> (7.28 cm). Treatment T<sub>0</sub> showed the lowest leaf width (6.66 cm). Treatment T<sub>11</sub> showed significantly maximum leaf thickness (8.43 mm) and it was found statistically at par with T<sub>9</sub> (8.33 mm) and T<sub>10</sub> (8.03 mm). Treatment T<sub>0</sub> showed the lowest leaf thickness (5.77 mm). Treatment T<sub>11</sub> showed significantly highest number of leaves (12.17) and it was found statistically at par with T<sub>9</sub>

(11.33). T<sub>0</sub> showed the lowest number of leaves (8.33). Maximum number of suckers per plant (5.97) was recorded in treatment T<sub>11</sub> followed by T<sub>9</sub> (5.83). Minimum number of suckers per plant was recorded in treatment T<sub>0</sub> (4.50).

Organic manures improve the availability of beneficial soil nutrient through increasing the microbial activities in soil thus helps in increasing the plant growth. In the study of Moorthy *et al.* (2012) [4] observed significant improvement in growth, yield and gel quality of *Aloe spp* by the application of biofertilizers. Eshun and He (2005) [2] also observed that organic manures and biofertilizers gives positive impact on increasing nutrients access of roots at Rhizosphere which helps in increase the number of leaves in *Aloe spp*. In the study conducted by Dipin (2014) [1] also found that increasing dose of organic manures up to a level increase the growth parameters of *Aloe vera*. Saha *et al.* (2005) [6] found that increased the application of cow dung helps in increased production in *Aloe vera* with regard to single leaf weight, leaf length and breadth, length and breadth of the leaf and weight of the leaf of *Aloe vera*.

**Table 1:** Effect of organic manures on the growth performance of *Aloe barbadensis*

Treatments	Plant height (cm)	Leaf length (cm)	Leaf width (cm)	Leaf thickness (mm)	Number of leaves	Number of suckers per plant
T <sub>0</sub> - Control (Soil only)	43.07 <sup>f</sup>	41.89 <sup>f</sup>	6.66 <sup>f</sup>	5.77 <sup>g</sup>	8.33 <sup>d</sup>	4.50
T <sub>1</sub> - FYM @ 5 t/ha	45.60 <sup>e,f</sup>	43.72 <sup>e,f</sup>	6.88 <sup>d,e,f</sup>	6.63 <sup>f</sup>	8.67 <sup>c,d</sup>	4.83
T <sub>2</sub> - FYM @ 7.5 t/ha	47.93 <sup>d,e</sup>	45.09 <sup>d,e,f</sup>	6.86 <sup>ef</sup>	6.63 <sup>f</sup>	8.67 <sup>c,d</sup>	5.17
T <sub>3</sub> - FYM @ 10 t/ha	48.27 <sup>c,d,e</sup>	46.69 <sup>c,d,e</sup>	6.93 <sup>def</sup>	6.90 <sup>e,f</sup>	9.40 <sup>c,d</sup>	5.23
T <sub>4</sub> - Vermicompost @ 2.5t/ha	49.30 <sup>c,d</sup>	48.21 <sup>b,c,d</sup>	7.06 <sup>c,d,e</sup>	7.03 <sup>d,e,f</sup>	9.43 <sup>c,d</sup>	5.17
T <sub>5</sub> - Vermicompost @ 5t/ha	50.10 <sup>b,c,d</sup>	48.27 <sup>b,c,d</sup>	7.12 <sup>bcd,e</sup>	7.13 <sup>d,e</sup>	9.67 <sup>c,d</sup>	5.33
T <sub>6</sub> - FYM @ 5t/ha + Vermicompost @ 2.5t/ha	50.33 <sup>b,c,d</sup>	48.60 <sup>b,c</sup>	7.07 <sup>b,c,d,e</sup>	6.97 <sup>d,e,f</sup>	9.50 <sup>c,d</sup>	5.50
T <sub>7</sub> - FYM @ 5t/ha + Vermicompost @ 5t/ha	50.17 <sup>b,c,d</sup>	48.73 <sup>a,b,c</sup>	7.28 <sup>b,c</sup>	7.63 <sup>b,c</sup>	9.50 <sup>c,d</sup>	5.67
T <sub>8</sub> - FYM @ 7.5t/ha + Vermicompost @ 2.5t/ha	50.40 <sup>b,c,d</sup>	48.78 <sup>a,b,c</sup>	7.15 <sup>b,c,d</sup>	7.33 <sup>c,d</sup>	9.67 <sup>c,d</sup>	5.43
T <sub>9</sub> - FYM @ 7.5t/ha + Vermicompost @ 5t/ha	52.87 <sup>a,b</sup>	50.83 <sup>a,b</sup>	7.34 <sup>b</sup>	8.33 <sup>a</sup>	11.33 <sup>a,b</sup>	5.83
T <sub>10</sub> - FYM @ 10t/ha + Vermicompost @ 2.5t/ha	50.93 <sup>b,c</sup>	49.62 <sup>a,b,c</sup>	7.09 <sup>b,c,d,e</sup>	8.03 <sup>a,b</sup>	10.00 <sup>b,c</sup>	5.67
T <sub>11</sub> - FYM @ 10t/ha + Vermicompost @ 5t/ha	54.67 <sup>a</sup>	52.04 <sup>a</sup>	7.89 <sup>a</sup>	8.43 <sup>a</sup>	12.17 <sup>a</sup>	5.97
Mean	49.47	47.71	7.11	7.24	9.69	5.36
SEm	0.99	1.13	0.10	0.15	0.46	0.50
CD (0.05)	2.92	3.34	0.29	0.43	1.36	NS
CV	3.46	4.11	2.37	3.47	8.21	16.15

## Conclusion

From the analysis of data revealed that application of different doses of organic manures significantly influenced growth attributes such as plant height, leaf length, leaf width, leaf thickness and number of leaves per plant of *Aloe barbadensis* found highest (FYM @ 10 t/ha + Vermicompost @ 5 t/ha). Therefore the study is recommended that application of FYM @ 10 t/ha + Vermicompost @ 5 t/ha the best results in case of growth of *Aloe barbadensis* in the Semi-arid region of Rajasthan.

## References

- Dipin MN. Growth and yield analysis of *Aloe (Aloe vera L. Burm F.)* under different organic nutrient regimes. M.Sc. thesis. Kerala Agricultural University, Thrissur, 2014.
- Eshun K, He Q. *Aloe vera*: A valuable ingredient for the food, pharmaceutical and cosmetic industries a review, Crit. Rev. Food Sci. Nutr. 2005;44:91-96.
- Hazrati S. Effects of various levels of N on productivity of *Aloe barbadensis* Mill. and its inhibitory effect on *Trichophyton rubrum*, Advances in Horticultural Science. 2012;24(4):187-190.
- Moorthy KS, Malliga P. Plant characteristics, growth and leaf gel yield of *Aloe barbadensis* Miller as affected by

cyan pithbio fertilizer in pot culture, Int. J Civil Struct. Eng. 2012;2(3):884-892.

- Mukesh SS, Patil MB, Shalini S, Vishnu B. *Aloe Vera*: Plant of immortality, Int. J Phar Sci. Res. 2010;1(1):7-10.
- Saha R, Palit S, Ghosh BC, Mittra BN. Performance of *Aloe vera* as influenced by organic and inorganic sources of fertilizer supplied through fertigation, Acta Horticulture. 2005;676:171-175.