Plant Archives Vol. 20, Supplement 1, 2020 pp. 1385-1388 **e-ISSN:2581-6063 (online), ISSN:0972-5210**

INFLUENCE OF ORGANIC INPUTS ON YIELD OF ALOE (*ALOE VERA* L.)

Muruganandam, C,* Thamizharasan, G.*; Kalidasan. T, and R. Rajeswari***

*Department of Horticulture,Faculty of Agriculture, Annamalai university, Annamalainagar, Tamil Nadu, India

**Department of Agricultural Extension, Faculty of Agriculture, Annamalai university, Annamalainagar, Tamil Nadu, India

Email: kaliagru@gmail.com

Abstract

An investigation was undertaken to study the "Effect of organic inputs on yield of Aloe (*Aloe vera*. L). Trial was conducted as a pot culture study at Floriculture unit in the Department of horticulture, Faculty of agriculture, Annamalai university, Annamalai nagar during 2018-2019. The experiment was carried out in completely randomized block design with fifteen treatments and replicated thrice. Healthy suckers of uniform size were collected from Vilamuthur village near Perambalur were used for the study. Application of organic inputs *viz.,* FYM @ 300, 400 and 500 g bag^{-1}, Pressmud @ 200, 300 and 400 g bag^{-1} and Humic acid @ 10, 20 and 30 mg kg^{-1} as soil application and @ 0.2%, 0.4%, 0.6% as foliar application bag^{-1} were given respectively. The results of the present study revealed that the yield attributes *viz* ., number of suckers plant^{-1}, single leaf weight, single plant weight, total plant yield bag^{-1} were significantly increased with soil application of FYM @ 500 g + Humic acid 30 mg kg^{-1} (T_6) followed by soil application of FYM @ 500 g + Humic acid @ 0.6 % foliar application T_{12}. The least value was obtained in Control.

***Keywords*:** Aloe, FYM, Pressmud, Humicacid

Introduction

Aloe vera is a perennial, drought resistant, succulent plant belonging to the family Liliaceae. It has a vast traditional role in indigenous system of medicine like Ayurveda, Siddha, Unani and Homoeopathy. *Aloe vera* is found as the wild herb along the coast of south India. It is under cultivation in fairly large areas in many parts of India *viz.*, Tamil Nadu, Gujarat, Maharashtra etc. Aloes are often thought to only grow in hot and dry climates, but they actually grow in a variety of climates including desert, grassland, and coastal or even alpine locations. *Aloe vera* has number of uses and mainly they are used as a food preservative and medicine. Commercially, Aloe can be found in pills, sprays, ointments, lotions, liquids, drinks, jellies and creams. Many of the health benefits associated with *Aloe vera* have been attributed to the polysaccharides contained in the gel of the leaves. Aloe gel has been used for tropical treatment of wounds, minor burns and skin irritations. Aloe can also be used as beverage. Aloe products for internal use have been promoted for constipation, coughs, wounds, ulcers, diabetes, cancer, headache, arthritis, immune-system deficiencies and many other conditions.

Organic farming is defined as the production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticide. Use of organics for increasing the production is emphasized because, continuous use of chemical fertilizers has led to several hazards in the soil by heavy withdrawal of nutrients (Prasad and Singh, 1981) and nutrient imbalance (Singh *et al.,*1989) and ultimately resulting in the reduction of crop yield. The growth of aloe in pots mainly depends upon physical conditions and nutrient content of the growing medium and cultural practices. Fertile growing medium ensures compact and profuse growth with larger leaves. The organic amendments in growing medium are considered as fertile source of nutrients to grow aloe in bags. This study brings to light the effectiveness of utilization of different organic inputs *viz*., humic acid, FYM and pressmud on the *Aloe vera* grown in polybags. Organic production practices have been standardized for many crops. It is yet to be standardized for the *Aloe vera* which is cultivated in coastal environment.

Materials and Methods

An investigation was carried out at the Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalainagar to study the "Effect of organic inputs on yield of Aloe (*Aloe vera* L.)" during the year 2017-2019. The experiment was carried out in completely randomized block design with fifteen treatments and replicated thrice. Grow bag of size I feet was used for the study. Healthy suckers of uniform size were collected from Vilamuthur village near Perambalur. Application of organic inputs *viz.,* FYM @ 300, 400 and 500 g bag^{-1}, Pressmud @ 200, 300 and 400 g bag^{-1} and Humic acid @ 10, 20 and 30 mg kg^{-1} as soil application and @ 0.2%, 0.4%, 0.6% as foliar application bag^{-1} were given respectively. The treatment details are T_1-Pressmud @ 200 g (SA) + Humic acid @ 10 mg kg-1 (SA), T_2-Pressmud @ 300 g (SA) + Humic acid @ 20 mg kg-1 (SA), T_3-Pressmud @ 400 g (SA) + Humic acid @ 30 mg kg^{-1} (SA), T_4-FYM @ 300 g (SA) + Humic acid @ 10 mg kg^{-1} (SA), T_5-FYM @ 400 g (SA) + Humic acid @ 20 mg kg^{-1} (SA), T_6-FYM @ 500 g (SA) + Humic acid @ 30 mg kg^{-1} (SA), T_7-Pressmud @ 200 g (SA) + Humic acid @ 0.2 % (FA), T_8-Pressmud @ 300 g (SA) + Humic acid @ 0.4 % (FA), T_9-Pressmud @ 400 g (SA) + Humic acid @ 0.6 % (FA), T_{10}-FYM @ 300 g (SA) + Humic acid @ 0.2 % (FA) , T_{11}-FYM @ 400 g (SA) + Humic acid @ 0.4% (FA), T_{12}- FYM @ 500 g (SA) + Humic acid @ 0.6% (FA), T_{13}-Pressmud @ 200 g, T_{14}-FYM @ 300 g, T_{15}-Control. (SA- Soil application, FA-Foliar application). The soil application of organic inputs (Press mud, Farmyard manure, Humic acid) were given at the time of planting. Foliar application of Humic acid was given at 30, 60 and 90 days after planting respectively. Observations on different yield characters *viz*., Single leaf weight (gm), number of suckers plant^{-1}, single plant weight (gm), total plant yield bag^{-1} (kg) were recorded and analysed stastically (Pance and Sukhatme, 1978).

Results and Discussion

The number of suckers plant^{-1} was recorded at 210 DAP and furnished in the table 1. The maximum number of

suckers per plant was observed in the treatment T_6-FYM @ 500g (SA) + humic acid @ 30 mg kg^{-1}(SA) (7.80), followed by T_{12}– FYM @ 500g (SA) + humic acid @ 0.6 % (FA) (7.39). The minimum number of suckers $plant^{-1}$ was recorded in T_{15}- control (1.90).

Significant differences were observed among the different treatments for single leaf weight (Table-2). Maximum single leaf weight was observed in the treatment T_6-FYM @ 500g (SA) + humic acid @ 30 mg kg^{-1} (SA) which recorded (180.60 gm) followed by T_{12}–FYM @ 500g (SA) + humic acid @ 0.6 % (FA) (171.50 gm). The lowest weight was recorded in T_{15}- control (53.10 g). The results are in accordance with the findings of Saha *et al.* (2005), Pichgram (1987) and Hasanuzzaman *et al.* (2008).

The single plant weight was recorded at 210 DAP and furnished in the Table 3. The maximum single plant weight was observed in the treatment T_6 – FYM @ 500g (SA) + humic acid @ 30 mg kg^{-1} (SA) which recorded (1150.20 g), followed by T_{12}– FYM @ 500g (SA) + humic acid @ 0.6 % (FA) (1097.30 g). The minimum single plant weight was recorded in T_{15}- control (404.60 g).

The total plant yield bag^{-1} was observed at 210 DAP and furnished in table 4. The maximum plant yield bag^{-1} was observed in the treatment T_6– FYM @ 500g (SA) + humic acid @ 30 mg kg^{-1}(SA) which recorded (8.65 kg), followed by T_{12}– FYM @ 500g (SA) + humic acid @ 0.6 % (FA) (8.24kg). The lowest plant yield bag^{-1} was recorded in T_{15}- control (2.98kg).

Yield is a highly complex parameter influenced by many factors or yield components and the ultimate goal of any crop management practice is to achieve increased yield. In *Aloe vera*, number of suckers $plant^{-1}$, single plant weight, single leaf weight and plant yield bag^{-1} constitute the yield components. Yield parameters significantly increased with the application of FYM 500 g (SA) + Humic acid @ 30 mg kg^{-1} (SA) (T_6) followed by FYM 500 g (SA) + Humic acid @ 0.6% (FA) T_{12}. The lowest value was recorded in (T_{15}) control. This result is in accordance with the findings of Baskar *et al.* (2001) who reported that application of FYM significantly increased the herbage yield in the third and fourth harvest in scented geranium. Anwar *et al.* (2001) reported that in palmarosa, herbage and oil yield increased due to the application of FYM. Increase in yield was mainly because of improvement in soil properties and available plant nutrients. Further FYM increased the soil organic carbon by 0.03 percent and improved the physical properties of soil (Khanna *et al.,*1975).

Increased yield of aloe might also be due to farmyard manure supplies N, P_2O_5 and K_2O in the available form to the plants through biological decomposition and accelerating respiratory process with increasing cell permeability and hormonal action. It also improves the physical properties of the soil such as aggregation, aeration in the farm itself.

Based on the findings of the present study it can be concluded that the application of FYM 500 g (SA) + Humic acid @ 30 mg kg^{-1} (SA) increased the yield parameters of aloe (*Aloe vera* L.).

Table 1 : Effect of organic inputs on number of suckers $plant^{-1}$ in *Aloe vera*

Treatments	Number of suckers $plant^{-1}$
T_1-Pressmud @ 200 g (SA) + Humic acid @ 10 mg kg^{-1} (SA)	3.74
T_2-Pressmud @ 300 g (SA) + Humic acid @ 20 mg kg^{-1} (SA)	4.56
T_3-Pressmud @ 400 g (SA) + Humic acid @ 30 mg kg^{-1} (SA)	5.38
T_4- FYM @ 300 g (SA) + Humic acid @ 10 mg kg^{-1} (SA)	6.19
T_5- FYM @ 400 g (SA) + Humic acid @ 20 mg kg^{-1} (SA)	6.99
T_6- FYM @ 500 g (SA) + Humic acid @ 30 mg kg^{-1} (SA)	7.80
T_7-Pressmud @ 200 g (SA) + Humic acid @ 0.2 % (FA)	3.33
T_8-Pressmud @ 300 g (SA) + Humic acid @ 0.4 % (FA)	4.15
T_9-Pressmud @ 400 g (SA) + Humic acid @ 0.6 % (FA)	4.97
T_{10}- FYM @ 300 g (SA) + Humic acid @ 0.2 % (FA)	5.80
T_{11}- FYM @ 400 g (SA) + Humic acid @ 0.4% (FA)	6.60
T_{12}- FYM @ 500 g (SA) + Humic acid @ 0.6% (FA)	7.39
T_{13}-Pressmud @ 200 g	2.40
T_{14}- FYM @ 300 g	2.92
T_{15}- Control	1.90
S.Ed	0.15
CD (p = 0.05)	0.31

Table 2 : Effect of organic inputs on single leaf weight (g) in *Aloe vera*

Treatments	Single leaf weight (g)
T_1-Pressmud @ 200 g (SA) + Humic acid @ 10 mg kg^{-1} (SA)	89.10
T_2-Pressmud @ 300 g (SA) + Humic acid @ 20 mg kg^{-1} (SA)	107.40
T_3-Pressmud @ 400 g (SA) + Humic acid @ 30 mg kg^{-1} (SA)	125.70
T_4- FYM @ 300 g (SA) + Humic acid @ 10 mg kg^{-1} (SA)	143.90
T_5- FYM @ 400 g (SA) + Humic acid @ 20 mg kg^{-1} (SA)	162.20
T_6- FYM @ 500 g (SA) + Humic acid @ 30 mg kg^{-1} (SA)	180.60
T_7-Pressmud @ 200 g (SA) + Humic acid @ 0.2 % (FA)	80.60
T_8-Pressmud @ 300 g (SA) + Humic acid @ 0.4 % (FA)	98.30
T_9-Pressmud @ 400 g (SA) + Humic acid @ 0.6 % (FA)	116.50
T_{10}- FYM @ 300 g (SA) + Humic acid @ 0.2 % (FA)	134.80

T_{11}- FYM @ 400 g (SA) + Humic acid @ 0.4% (FA)	153.10
T_{12}- FYM @ 500 g (SA) + Humic acid @ 0.6% (FA)	171.50
T_{13}-Pressmud @ 200 g	62.20
T_{14}- FYM @ 300 g	71.10
T_{15}- Control	53.10
S.Ed	3.49
CD (p = 0.05)	7.13

Table 3 : Effect of organic inputs on single plant weight (g) in *Aloe vera*

Treatments	Single plant weight (g)
T_1-Pressmud @ 200 g (SA) + Humic acid @ 10 mg kg^{-1} (SA)	619.40
T_2-Pressmud @ 300 g (SA) + Humic acid @ 20 mg kg^{-1} (SA)	725.60
T_3-Pressmud @ 400 g (SA) + Humic acid @ 30 mg kg^{-1} (SA)	831.60
T_4- FYM @ 300 g (SA) + Humic acid @ 10 mg kg^{-1} (SA)	937.40
T_5- FYM @ 400 g (SA) + Humic acid @ 20 mg kg^{-1} (SA)	1044.20
T_6- FYM @ 500 g (SA) + Humic acid @ 30 mg kg^{-1} (SA)	1150.20
T_7-Pressmud @ 200 g (SA) + Humic acid @ 0.2 % (FA)	566.50
T_8-Pressmud @ 300 g (SA) + Humic acid @ 0.4 % (FA)	672.30
T_9-Pressmud @ 400 g (SA) + Humic acid @ 0.6 % (FA)	778.50
T_{10}- FYM @ 300 g (SA) + Humic acid @ 0.2 % (FA)	884.50
T_{11}- FYM @ 400 g (SA) + Humic acid @ 0.4% (FA)	990.50
T_{12}- FYM @ 500 g (SA) + Humic acid @ 0.6% (FA)	1097.30
T_{13}-Pressmud @ 200 g	458.20
T_{14}- FYM @ 300 g	512.60
T_{15}- Control	404.60
S.Ed	23.29
CD (p = 0.05)	47.58

Table 4 : Effect of organic inputs on total plant yield bag^{-1} (kg) in *Aloe vera*

Treatments	Total plant yield bag^{-1} (kg)
T_1-Pressmud @ 200 g (SA) + Humic acid @ 10 mg kg^{-1} (SA)	4.64
T_2-Pressmud @ 300 g (SA) + Humic acid @ 20 mg kg^{-1} (SA)	5.41
T_3-Pressmud @ 400 g (SA) + Humic acid @ 30 mg kg^{-1} (SA)	6.19
T_4- FYM @ 300 g (SA) + Humic acid @ 10 mg kg^{-1} (SA)	7.01
T_5- FYM @ 400 g (SA) + Humic acid @ 20 mg kg^{-1} (SA)	7.83
T_6- FYM @ 500 g (SA) + Humic acid @ 30 mg kg^{-1} (SA)	8.65
T_7-Pressmud @ 200 g (SA) + Humic acid @ 0.2 % (FA)	4.23
T_8-Pressmud @ 300 g (SA) + Humic acid @ 0.4 % (FA)	5.05
T_9-Pressmud @ 400 g (SA) + Humic acid @ 0.6 % (FA)	5.78
T_{10}- FYM @ 300 g (SA) + Humic acid @ 0.2 % (FA)	6.60
T_{11}- FYM @ 400 g (SA) + Humic acid @ 0.4% (FA)	7.41
T_{12}- FYM @ 500 g (SA) + Humic acid @ 0.6% (FA)	8.24
T_{13}-Pressmud @ 200 g	3.40
T_{14}- FYM @ 300 g	3.82
T_{15}- Control	2.98
S.Ed	0.17
CD (p = 0.05)	0.35

References

Anwar, M.D.D.; Patra, S.C. and Singh, D.V. (2001). Evaluation of organic inorganic amendments in acid soil on the growth of palmarosa. J. Med. and Aro. Pl. Sci., 23: 15-16.

Baskar, S.; Vasanthakumar, T.; Sivananda, T.N.; Arun, M.N.; Janardhan, C. and Ramachandran, C. (2001). Effect of FYM, nitrogen levels and its method of application on scented geranium. J. Med. and Aro. Pl. Sci., 23: 388-391.

Hasanuzzaman, M.; Ahamed, K.U.; Khalequzzaman, K.M.; Shamsuzzaman, A.M.M. and Nahar, K. (2008). Plant characteristics, growth and leaf yield of *Aloe vera* as affected by organic manure in pot culture. Australian J. Crop Sci., 2(3): 158-163.

Khanna, P.K.; Jagannath, S.N.; and Goyai, V.P. (1975). Effect of organic manuring on some physical properties of sandy loam soils of Hassar. J. Indian Soc. Soil Sci., 23(3): 380-383.

Pance, V.G. and Sukhatme, P.V. (1978). Statistical methods for agricultural workers. ICAR. New Delhi.

Pichgram, N. (1987). Investigation on plant spacing and fertilizer effect on growth of Aloe (*Aloe barbadensis* Mill.). Ph.D. Thesis. Dept. of Horticulture, Graduate School. Faculty of Agriculture, Kasetsart Univ., Bangkok (Thailand).

Prsad, B. and Singh, A.P. (1980). Changes in soil properties with long-term use of fertilizer, lime and FYM. J. Indian Soc. Soil Sci., 28(4): 465-468.

Saha, R.; Patil, S.; Ghosh, B.C. and Mittra, B.N. (2005). Performance of *Aloe vera* as influenced by organic and inorganic sources of fertilizer supplied through fertigation. Acta Hort., 676: 171-175.

Singh, A.P.; Sakak, R. and Sinha, R.B. (1989). Effect of changing pattern and fertility levels on crop yields and micronutrients status of soil after five cycles of crop rotations. Ann. Agric. Res., 10(4): 361-367.