Int.J.Curr.Microbiol.App.Sci (2023) *12*(06): 242-246

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 12 Number 6 (2023)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2023.1206.029

Effect of Media on Performance of Agloanema and Snake Plant

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Keywords

Agloanema, snake plant, media, ornamental plants, leaves, scent

Article Info

Received:
06 May 2023
Accepted:
05 June 2023
Available Online:
10 June 2023

A B S T R A C T

An investigation on effect of media on performance of agloanema and snake plant was laid out at College of Horticulture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli during the year 2020-21 and 2021-22 in completely randomized design and replicated five times and revealed that significantly maximum survival (91.33 and 95.33 %) in treatment M_2 i.e. charcoal + vermicompost + rice husk + coconut husk + FYM (1:1:1:1:1) in agloanema and snake plant crops; respectively. Vegetative parameters such as plant height (61.97 and 65.14cm), leaf breadth (6.55 and 5.76 cm) were significantly superior in treatment M_2 i.e. charcoal + vermicompost + rice husk + coconut husk + FYM (1:1:1:1:1) in agloanema and snake plant. Other growth parameters revealed that significantly maximum number of suckers (8.58 and 12.09), fresh stem weight (450.03 g and 0.95 kg), dry stem weight (40.65 and 102.71 g) were significantly superior in treatment M_2 i.e. charcoal + vermicompost + rice husk + coconut husk + FYM (1:1:1:1:1).Chlorophyll a (1.62 and 2.32 mg/g), chlorophyll b (0.44 and 0.58 mg/g) and total cholorophyll (2.06 and 2.91 mg/g)were significantly superior in treatment M_1 i.e. vermicompost + FYM (3:1) in agloanema and snake plant crops; respectively.

Introduction

Ornamental plants are plants that are primarily grown for their beauty but also for qualities such as scent or how they shape physical space. These plants grown for the display of aesthetic features including leaves, scent, overall foliage texture, stem and bark, and aesthetic form. However, ornamental plants also serve some less obvious uses such as for fragrance, for attracting wildlife and for cleaning the air (Jenkins *et al.*, 1992). Ornamentals encompass a wide array of plants and are classified into several groups: cut flowers, ornamental grasses, lawn or turf grasses, potted and indoor plants, bedding plants, trees and shrubs.

Foliage plants, defined literally, would include all plants grown for their attractive leaves rather than for flowers or fruits. In general horticultural terms, foliage plants are mostly those with attractive

foliage and flowers that are able to survive and grow indoors. Thus, they are used as living plants for interior decoration or interior plant scaping. Foliage plants, in common terminology, are called house plants.

With an increasing demand of container-grown plant material to use within the country and for shipment to the foreign countries, the need of a light weight growing medium prepare with locally available material has more important. Growth medium is known to have effect of value of potted ornamental plants and plays an important role on germination rate and many other physiological parameters. A best growing media should have proper aeration, water holding capacity and adequate nutrition supply when applied in combination with soil less substrates (Khobragade *et al.,* 1997). Coco peat is growing acceptance as a growing medium because of its excellent aeration, durability, lightness and water holding characteristics. (Nazari *et al.,* 2011).

Potting medium plays an important role in growth of foliage plants. Successful production of container grown plants is largely dependent on the physicochemical properties of the potting media. The presence of sufficient nutrition, good water holding capacity, porosity and plug formation ability of media increases the root and shoot growth, which ultimately, leads to early and high yield of the crop. A good potting medium should provide suitable environment for the compact growth of plants. Conventionally, top soil is used as a major component of potting medium. However, nowadays soil based media are not permitted for export purpose, because of the weight of media and risk of soil borne pathogens. Hence there is a need to standardize a suitable soilless medium for export of potted ornamental foliage plants.

Materials and Methods

The experiment was conducted at the Hi-Tech unit, College of Horticulture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist-Ratnagiri (M.S) during the period 2020-21 and 2021-22. Experiment was "Effect of media on performance of agloanema and snake plant. Two crops agloanema and snake plant were studied with four different soil less media combinations. *viz.*, M_1 i.e. vermicompost + FYM (3:1), M_2 i.e. charcoal +vermicompost + rice husk + coconut husk + FYM (1:1:1:1:1), M_3 i.e. coco-peat + rice husk + FYM + charcoal + coconut husk (1:1:1:1:1) and M_4 i.e. coco-peat + vermicompost + wood shaving + charcoal + FYM (1:1:1:1:1)and was laid out in completely randomized design and replicated five times.

The 50 % shade net structure was constructed at High-Tech College of Horticulture Dapoli. 200 plants of each species agloneama (*Aglaonema commutatum*) and snake plant (*Sansevieria zeylanica)* used for the experiment. Observations on vegetative parameters viz. plant height, leaf length and leaf breadth. Various growth parameters taken at end of the experiment *viz.* survival percentage, number of suckers, fresh and dry stem weight, chlorophyll a, b and total were recorded at proper stage and analyzed statistically by the method suggested by (Panse and Sukhatme, 1978).

Application of fertilizers for proper growth and development at regular interval was followed for aglaonema and snake plant. Fertilizers were given two weeks after transplanting. Foliar spray of water soluble fertilizer (19:19:19) (2g/l) twice in the week and magnesium sulphate (1g/l) and calcium nitrate (1g/l) was given at one month interval. Micronutrient spray was given at one week intervals @ (1g / l). Chlorophyll content of leaves was measured by using a spectronic 20 as described by Starnes and Hadley, (1965). Fully matured second terminal green leaf was used for estimation. One gram of the representative sample collected from five plants chosen at random, under each treatment, was used for analysis. Standard procedure was followed for the preparation of sample (Starnes and Hadley, 1965). The OD (A) of an aliquot was measured at wave length of 645 nm and 663 nm. The contents of chlorophyll 'a', 'b' and 'total were then estimated using the following relationships.

The data were recorded and the average was expressed in mg/g.

Chlorophyll 'a' = 12.72 (A 663) – 2.58 (A 645)

Chlorophyll 'b' = 22.87 (A 645) – 4.67 (A 663)

Total Chlorophyll (a + b) = 8.05 A 663 + 20.29 A 645

Results and Discussion

The data presented in table 1 and 2 revealed that, The effect of these four media combination treatments with respect to survival percentage, vegetative parameters, and growth parameters which are taken at end of the experiment for two years. Observations take at monthly interval in both agloanema and snake plant crops. The results are presented under following heads.

Agloanema

It was observed in agloanema, from the pooled data of two seasons that after planting, the treatment M_2 i.e. charcoal + vermicompost + rice husk + coconut husk + FYM (1:1:1:1:1) recorded significantly maximum survival (91.33 %),similar results were reported by Thokchom and Maitra (2017) with vermiculite + coconut husk in anthurium. The results were in agreement with Sabareeswaran *et al.,* (2018) in dendrobiumvar. Thongchai Gold. Whereas, minimum survival (76.67 %) was recorded in treatment M_4 i.e. coco-peat + vermicompost + wood shaving + charcoal + FYM (1:1:1:1:1) growing media. The treatment M_2 i.e. charcoal + vermicompost + rice husk + coconut husk + FYM (1:1:1:l:1) recorded significantly maximum plant height (61.97 cm), the finding in line with above was noticed by Rashidha *et al.,* (2021); Khomami *et al.,* (2021). The treatment M_2 i.e. charcoal + vermicompost + rice husk + coconut husk + FYM (1:1:1:l:1) recorded significantly maximum leaf breadth (6.55 cm), number of suckers (12.09), fresh and dry stem weight (450.03 and 40.65 g). The treatment M_3 i.e. coco-peat + rice husk + FYM + charcoal + coconut husk (1:1:1:1:1) recorded significantly maximum leaf length (26.42 cm). The treatment M_1 i.e. vermicompost + FYM (3:1) recorded significantly maximum chlorophyll a (1.62 and mg/g), chlorophyll b (0.44 and mg/g) and total chlorophyll (2.06 and mg/g) in agloanema, similar results were recorded by Sanghamitra *et al.,* (2019). The treatment M_4 i.e. coco-peat + vermicompost + wood shaving + charcoal + FYM (1:1:1:1:1)which recorded minimum survival (76.67 %), plant height (57.07 cm), leaf length (24.34 cm), leaf breadth (5.93 cm), number of suckers (7.48), dry stem weight (34.44 g).The treatment M_4 i.e. coco-peat + vermicompost + wood shaving + charcoal + FYM (1:1:1:1:1) recorded significantly maximum chlorophyll a (1.50 mg/g), chlorophyll b (0.33 mg/g) and total chlorophyll (1.84 mg/g).

Snake plant

It was observed in snake plant, from the pooled data of two seasons that after planting, the maximum survival (95.33 %) was recorded in treatment M_2 i.e. charcoal +vermicompost + rice husk + coconut husk + FYM (1:1:1:1:1).Similar results were also reported by Selvaraj and Bharathi (2018); Sabareeswaran *et al.,* (2018). The treatment M_2 i.e. charcoal + vermicompost + rice husk + coconut husk + FYM (1:1:1:l:1) recorded significantly maximum plant height (65.14 cm), leaf length (53.18 cm), leaf breadth (5.76 cm) number of suckers (12.09), fresh and stem weight (0.95 kg102.71 g). The treatment M_1 i.e. vermicompost + FYM (3:1) recorded significantly maximum chlorophyll a (2.32 mg/g), chlorophyll b (0.58 mg/g) and total chlorophyll (2.91 mg/g) in snake plant; Tatte *et al.,* (2018); Alaguthurai and Thayamini (2019) have similar results. Whereas, minimum survival (82.67 %), plant height (57.50 cm), leaf length (48.21 cm), leaf breadth (4.93 cm), number of suckers (8.95), fresh and dry stem weight (0.83 kg and 96.12 g), chlorophyll a (2.01 mg/g), chlorophyll b (0.49 mg/g) and total chlorophyll (2.50 mg/g) was recorded in treatment M_4 i.e. coco-peat + vermicompost + wood shaving + charcoal + FYM (1:1:1:1:1) growing media.

Table.1 Effect of growing media on growth parameters of agloanema

Treatments	Survival (%)	Plant height (cm)	Leaf length (cm)	Leaf breadth (cm)	Number of suckers	fresh stem weight (g)	dry stem weight (g)	Chlorophyll a (mg/g)	Chlorophyll b (mg/g)	Total Chlorophyll (mg/g)
M_1	88.67	58.61	25.20	6.37	7.69	439.98	36.57	1.62	0.44	2.06
M_2	91.33	61.97	25.89	6.55	8.58	450.03	40.65	1.58	0.38	1.96
M_3	88.67	60.21	26.42	6.41	7.84	447.95	39.20	1.55	0.38	1.93
M_4	76.67	57.07	24.34	5.93	7.48	440.41	34.44	1.50	0.33	1.84
SE(m) ±	1.27	0.50	0.25	0.09	0.13	1.62	0.99	0.009	0.010	0.017
CD at 1%	5.24	2.05	1.02	0.38	0.55	6.70	4.09	0.036	0.043	0.071

Table.2 Effect of growing media on growth parameters of snake plant.

Treatments	Survival (%)	Plant height (cm)	Leaf length (cm)	Leaf breadth (cm)	Number of suckers	Fresh stem weight (kg)	Dry stem weight (g)	Chlorophyll a (mg/g)	Chlorophyll b (mg/g)	Total Chlorophyll (mg/g)
M_1	94.00	61.58	49.84	5.43	9.05	0.84	96.13	2.32	0.58	2.91
M_2	95.33	65.14	53.18	5.76	12.09	0.95	102.71	2.19	0.54	2.73
M_3	92.00	63.40	50.43	5.56	10.20	0.90	98.85	2.09	0.52	2.61
M_4	82.67	57.50	48.21	4.93	8.95	0.83	96.12	2.01	0.49	2.50
SE(m) ±	1.50	0.82	0.34	0.10	0.48	0.01	0.89	0.03	0.01	0.04
CD at 1%	6.16	3.38	1.38	0.42	2.00	0.06	3.70	0.14	0.05	0.15

In present study of growing media for aglaonema and snake plant, the media combination (charcoal +compost + rice husk + coconut husk + FYM) (1:1:1:1:1) i.e. treatment M_2, (coco-peat + rice husk + FYM + charcoal + coconut husk) (1:1:1:1:1) i.e. treatment M_3 were found most suitable with respect to survival percentage in aglaonema (91.33, and 88.67 %) and in snake plant (95.33 and 94.00 %). Similarly media combination (charcoal + compost + rice husk + coconut husk + FYM) (1:1:1:1:1) i.e. treatment M_2 was found to be best with respect to vegetative and growth parameters taken at end of the experiment i.e. plant height, length and breadth, number of suckers, fresh and dry stem weight in agloanema and snake plant.

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How to cite this article:

Chavan, V. B., R. G. Khandekar, B. R. Salvi, V. G. Salvi and Pawar, C. D. 2023. Effect of Media on Performance of Agloanema and Snake Plant. *Int.J.Curr.Microbiol.App.Sci.* 12(06): 242-246.
doi: https://doi.org/10.20546/ijcmas.2023.1206.029