



## Effect Waste of Palm Trees and Sand and Perlite Mixed with Some Growth Indices *Ficus benjamina*

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### ABSTRACT

An important factor in the growth medium of plants and chemical plants. native substrates can be used to improve plant performance. To evaluate the effect of growth medium on the herb *F. benjamina* experimental design was completely randomized with eight treatments and four replications were carried out in the research greenhouse of Islamic Azad University of Jiroft. *F. benjamina* plants from vegetative characteristics showed significant differences with each other. The maximum chlorophyll index and number of branches of palm peat substrates, respectively. The use of native substrates for growth was *F. benjamina*. Palm peat substrate, makes for a very low cost and have a very low ph features such as good water absorption, especially *F. benjamina* plant is used for all files.

**Keyword:** Substrates, *F. benjamina*, Leaf area, number of branches.

### INTRODUCTION

One factor that is of great importance to the cultivation of flowers and ornamental plants, it is the media. Planting plants in containers as an important component of the nursery Technology has grown. Compared with farm volume for each plant growing media used, Greatly reduced plant growth largely influenced by the physical and chemical properties of growing media used. Therefore, good management bed potted plants, causing the plants that will be of good quality. A good growing media besides having optimal physical properties - and biological, Should be available, relatively inexpensive, stable and style enough to work with it easier and cost-effective transportation is profitable in economic terms (Higaki, and imanmura,. 1985). Today plant soilless substrates used in greenhouses for the production of potted plants and herbs Transplanting is expanding. These materials usually include a mix of planting beds to such Peat moss and bark, compost and a variety of inorganic materials such perlite, vermiculite, sand and rock wool are. Khalighi and Padasht (2000) a study of replacement substrates with peat moss, bark, tea wastes, bark, rice and Azolla as substrates for potted plants have Cultivating in bed with Marigold and concluded that composted bark in pure form or in combination with other materials, can be good substitute for peat moss. The burgers (Burger, 1997) showed that composted green waste can be used as substrates for soilless cultivation or to improve the water-holding capacity of soil to be used. The garden has a range of

materials including hardwood and Softwood bark, leaves, soil, waste, sewage sludge and coconut (cocopeat) has been used as a seed bed (Hesami et al, 2010; Hematian Dehkordi et al, 2010; Higaki, and imanmura,. 1985). Cocopeat of physically foamed material like peat moss, which is made of coconut shell fruit. Today the use of this substance in many European countries including the Netherlands and the England as an alternative to peat moss is growing (Burger, 1997). The palm waste, including substances that are very similar with cocopeat and fiber palm tree is obtained. In Iran there are more than 30 million palm trees Every year large amounts of waste produces Or It is incinerated or Low level are used in the paper industry (Borji et al., 2010). pothos longest tiller in cocopeat substrate and the lowest was observed in the index of sugarcane bagasse. Palm peat moss and peat substrates of the tiller were not significantly different from each other (Samii et al, 1384a). Palm peat substrates with regard to economic issues, in order to increase moisture storage, The primary material can be prepared as a good growing media for the producing's presented level Country. Peat moss because of high cost of owning and poor absorption characteristics like low PH then once dry, is not applicable to all plants (Samii et al, 1384b). According to the cultivation of palm in the country (40000 ha), producing nearly 15 kg of waste per palm per year, and it's lowest in the area of research necessary to replace all or at least part of the peat that is expensive, Excessive extracted causes irreparable damage to the environment will be felt. This study was conducted to investigate the possibility of replacing peat moss palm waste and impact studies on growth characteristics were studied.

## MATERIALS AND METHODS

The experimental design was completely randomized with four replications of eight treatments. treatments to planting beds with sand + perlite that the combination was as follows:

- 1- 100% peat moss
- 2- 100% peat palm
- 3- 100% cocopeat
- 4- 100% cocochepts
- 5- 50% peat moss + 25% sand + 25% perlite
- 6- 50% peat palm + 25% sand + 25% perlite
- 7- 50% cocopeat + 25% sand + 25% perlite
- 8- 50% cocochepts + 25% sand + 25% perlite

### Prepare media and planting plants

Cocopeat commercial with the aim of reducing the cost of transportation, the compressed unit (block) supplied. Before applying this material the amount of water to opening up and voluminous, was added to it to have a completely uniform. The substrates peat moss, peat, palm cocochepts nothing did not and the materials were used as primary. In treatments containing sand + perlite, these four types of seed bed volume ratio of 1:1 and mixed with sand + perlite were used. First of all pasteurized potting culture media with 2% sodium hypochlorite for disinfection were. First, of wooden cuttings in a bed of sand *F.benjamina* rooted in the greenhouse environment, then the rooted cuttings were transferred to pots with a diameter of 17 cm. the pots were filled with the material examined. After planting in pots in a greenhouse with temperature (winter 20-25 °C) and in summer (30-35 °C) were kept on planting plans. Growth of the indicator stem diameter, stem length and lateral shoot number, leaf area, specific leaf area and chlorophyll index was measured.

## Data Analysis

Analysis was performed on data using SPSS 16. Comparisons were made using one-way analysis of variance (ANOVA) and Duncan's multiple range tests. Differences were considered to be significant at  $P < 0.05$ .

## RESULTS

*F.benjamina* plants from vegetative characteristics were significantly different from one another. (Tab 1). Results showed that the mean bed 50% peat moss + 25% sand + 25% perlite and peat moss has the highest average stem length 94.50, 94.25 cm was obtained from a statistically significant difference have showed. The lowest average stem length 58.50 cm was observed in cocopeat substrate. The highest lateral shoot in palm peat substrate, respectively, with a mean 80/43 cm, respectively. The lowest bed of 50% cocochepts + 25% sand + 25% perlite and cocochepts with mean 25.22, 27.02, respectively. The highest number of branches in the bed 50% peat moss + 25% sand + 25% perlite, with a mean 29.25, and the lowest bed of 50% peat palm + 25% sand + 25% perlite with an average of 14, respectively, which showed a statistically significant difference. Most of the leaf area bed 50% cocopeat + 25% sand + 25% perlite with a mean 75.77 cm and lowest in cocopeat substrate with a mean 46.40 cm, respectively.

Highest chlorophyll index of the substrate cocochepts mean (40.23 mg/lit) and the lowest bed of 50% peat palm + 25% sand + 25% perlite mean (52.27), respectively. mean highest diameter of the palm peat substrate (1.19 cm) and the lowest mean (0.84 cm) in the context 50% cocochepts + 25% sand + 25% perlite obtained a statistically significant difference said. Add 25% sand + 25% perlite substrates on growth indices such as lateral stem length and stem diameter minimum were obtained, The highest value obtained in other indexes which show pure increase in beds with sand + perlite to grow their substrates.

## DISCUSSION

Perlite + sand substrate interactions in organic cultivation on the parameters of the main stem length, chlorophyll index, number of branches, leaf area and specific leaf area had the highest amount, Peat moss so that in pure amount of main and lateral shoot length, chlorophyll index, number of branches and lower leaf area produced when used with sand + perlite was increased (Table 1).

The observed growth indices observed that the highest of the growth culture medium caused to a very low cost Palm peat, and having characteristics such low ph water absorption and good files for all plants is especially *F.benjamina* the results of many researchers Shabani et al [12], Hamtian dehkordi et al [5], Samii et al. [11], Samii et al [12] is consistent.

Highest of the leaf area litter 50% cocopeat + 25% sand + 25% perlite respectively. cocopeat due to its physical and chemical properties good the best growth of plants caused. cocopeat because the sponge properties and having the smallest particle size, water has the highest amount of power (Noguera et al., 2000). but the state does not cause flooding in the pot because it is the property of the capillary bed and slowly loses its water.

Today, many substances that are used as planting beds, each with unique characteristics are, in general, these materials have the capacity to storage water, adequate ventilation, proper drainage and high cation

exchange capacity, and they also should not have any adverse impact to the plant (Jvanpvr Heravi et al, 2005).

Palm peat substrates for most plant growth did not differ significantly with peat Moss and this issue implies that the substrate has the ability replace peat moss the results of Shabani researchers and et al (2011), Hussam et al (2010), Hematian dehkordi, et al (2010), Samiee et al (2004a), Samiee et al (2004b) is consistent.

Verdonc, and Gabriels [1992] resulting from the composting of tobacco waste (nitrogen source) and the tree bark and leaves broad leaf fig and ficus to growth two plants were used, 10% and 90% of the composting of tobacco waste tree bark on plant height and number of leaves they have a very good combination for plants introduced as a combination.

Khalighi and Padasht [2000] with replacement of medium with peat moss, bark, tea wastes, bark rice and azolla as substrates for potted plants have foster in bed with marigold dwarf and concluded that bark compost in pure form or in combination with other materials, can be a viable alternative to peat moss.

Palm peat substrates with regard to economic issues, in order to increase moisture storage, after the initial preparation of this article can be a good medium for the production's presented country level. Peat is acidic and has a high cation exchange capacity and on top of the substrates used. peat beds, flowering delay and high performance in this beds. keeping humidity capacity is higher in the medium [Mashadi jahafarpour et al., 2012]. However, about ten times the dry weight is water retention capacity [KhoshKhui et al, 2006]. differences due to differences in plant growth in different culture media on the cation exchange capacity (CEC), water holding capacity, etc. are attributed to the amount of porosity [Verdonc, and Gabriels,. 1992].

## CONCLUSIONS

According to the results obtained in this study, due to economic problems and to use recovery agricultural waste, can palm waste as a suitable alternative to peat moss in the media popular culture *Ficus benjamina* recommended, The study also determined that mixing the waste with peat palm healing characteristics such as increased porosity and water keep capacity is improve the nutritional condition of the product.

Overall, according to results, since it is very expensive imported peat, Use it as substrates no economic justification in Iran. considering that there are many sources of waste in the south palm, the physical properties of the substrates used for high functionality can be and also the its good price than any other ground in kerman province can be recommended as a suitable medium.

## REFERENCES

- Abdolahi, Y., Yavarzade, M.R and Vakili, M.A. (2011). Effect of the Growing Media and Fe and Zn on the Growth and Essential Oil of Rosmarinus Officinalis L. in the Bam Region.j medicinal and spice plants research, 1(4): 19 – 9.
- Borji, H., Mohammadi Ghahsareh, A and Jafarpour, M. (2010). Effects of Date Palam and Cocopeat substrates on yield and quality of tomato in soilless culture. Proceedings of the 5<sup>red</sup> National Conference on New Ideas in Agricultural Branch, Isfahan, Iran. Pp: 131.

- Burger, D.W. (1997). Composted green waste as a container medium amendment for the production of ornamental plants. *HortScience*, 32: 57 - 60.
- Hesami, A., Amini, F., Sarikhani, Q and Bir ghdar kashkol, A. (2010). use of Palm waste as an alternative to the Cocopeat hydroponic strawberry cultivation. *Proceedings of the Second National Conference on Agriculture and Sustainable Development*, pp: 1-4.
- Hematian Dehkordi., M. Mohamadi Ghahsareh, A and Kalbasi, M. (2010). Effect of palm peat and its mixtures with soil on yield and some growth index of hydroponically grown cucumber. *Proceedings of the 5<sup>th</sup> National Conference on New Ideas in Agricultural Branch*, Isfahan, Iran, Pp: 215.
- Higaki, T and imanmura, J.S. 1985. Performance of food products as media for culture of Anthuriums. *College of Hawaii. Research series*, pp: 40.
- Javanpour Heravi, R., Babalar, M., Mir Abdolbaghi, M and Askari, M. (2005). Effect of Hydroponic nutrient solution and substrate on quantitative and qualitative characteristics of tomato growing in greenhouse. *Journal of Agricultural Sciences Iranian*, 36 (4): 939-946.
- Khilighi, A and Padasht Dehkaee, M.N. (2000). Effect of media produced by tree bark, tea waste, rice hull and azolla as a substiuta for peat, on growth and flowering of marigold (*Tagetes patula* cv. Golden Boy). *Iranian J. Agric, Sci*, 71(3): 557 – 565.
- KhoshKhui, M., Shybany, B., Rouhani, L and Tafazoli E. (2006). *Principles of horticultural science*. 14<sup>th</sup> printing. Shiraz University Press. Iran, pp: 594.
- Mashadi jahafarpour A, Henareh M. (2009). All substrates used in hydroponic culture. 1<sup>st</sup> National Congress of hydroponic sand green house production. Isfahan, Pp: 254.
- Noguera, P., Abad, M., Noguera, V., Puchades, R and Maquieira, A. (2000). Coconut coir waste, a new and viable ecologically friendly peat substitute. *Acta Hort*, 517: 279 - 286.
- Samiei., L, Khalighi, A., kafi, M and Samavat, S. (2004a). Peat Moss Substituting with Some Organic Wastes in Pothos (*Epipremnum aureum* golden pothos) growing media. *Iranian Journal of Horticultural Sience and Technol ogy*, 6 (2): 88 - 79.
- Samiei, L., Khalighi, A., kafi, M., Samavat, S and Arghavani, M. (2004b). An Investigation of Substitution of Peat Moss With Palm Tree Celluloid Wastes in Growing Aglaonema (*Aglaonema Commutatum* Cv. Silver Queen). *Iranian, J. Agric. Sci*, 36 (2): 510 – 503.
- Shabani, T., Peyvast, G.H and Olfati, J. (2011). Effect of different substrates on quantitative and qualitative traits of three pepper cultivars in soilless culture. *J. Science and Technology of Greenhouse Culture*, 2(6): 11 – 21.
- Verdonc, O and Gabriels, R.I. (1992). Reference method for the determination of physical properties of plant substrates. II. Reference method for the determination of chemical properties of plant substrates. *Acta Hort*, 302: 169 – 179.

**Tab 1** - Effect of Different Potting Mixes on Growth *Ficus benjamina*

	<b>Chlorophyll Index (mg/L)</b>	<b>Specific leaf area (cm<sup>2</sup>)</b>	<b>leaf area (cm<sup>2</sup>)</b>	<b>No. branches</b>	<b>Side stem length (cm)</b>	<b>Length of main stem (cm)</b>	<b>Stem diameter (cm)</b>
<b>100% peat moss</b>	46.64 abc	73.06 a	59.49 ab	26.25 a	32 bc	94.25 a	1.16 ab
<b>100% peat palm</b>	49.86 ab	65.46 a	57.71 ab	25.25 a	43.80 a	93.50 a	1.19 a
<b>100% cocopeat</b>	46.48 abc	72.99 a	46.40 b	18.50 b	35.57 abc	58.50 b	1.06 abc
<b>cocochepts</b>	40.23 c	72.97 a	51.37 b	18.75 b	27.02 c	72.50 ab	0.93 abc
<b>50% peat moss + 25% sand + 25% perlite</b>	47.47 abc	74.14 a	57.39 b	29.25 a	40.25 ab	94.50 a	1.12 ab
<b>50% peat palm + 25% sand + 25% perlite</b>	52.27 a	71.98 a	60.69 ab	14 b	31.58 bc	74.25 ab	0.92 bc
<b>50% cocopeat + 25% sand + 25% perlite</b>	47.59 abc	72.76 a	75.77 a	15 b	30.45 bc	70 b	1 abc
<b>50% cocochepts + 25% sand + 25% perlite</b>	42.43 bc	68.59 a	50.41 b	16.25 b	25.22 c	61 b	0.84 c
<b>Cv%</b>	10.86	11.13	19.46	18.32	20.04	18.27	13.35

Means followed by same letter are not significantly different at P< 0.05 probability using Duncan's test.