Economics

The economics analysis of t he study was made by computing the net monetary return and benefit cost ratio (Table 3) Though there was a reduction in seed cotton yield under intercropped situation, it was well compensated by additional yield from intercrop thereby registering higher economic returns. Higher net return of Rs.17208/ha besides a higher benefit cost ratio of 3.38 was recorded under paired row planting of cotton with two rows of black gram as intercrop and applied with 60 kg N + *Azospirillum*. This practice resulted in a sawing of 20 kg fertilizer N to cotton .

From the present study, it can be concluded that raising summer cotton (MCU 5) in paired row geometry with the rows of black gram (ADT 3) as intercrop and applied with 60 kg N + *Azospirillum* was found to be more advantageous and profitable.

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UTILISATION OF COIR PITH AS POT CULTURE MEDIUM FOR *Begonia semperflorens*

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ABSTRACT

The efficacy of coir pith in the preparation of potting medium was evaluated using a rose-coloured clone of *Begonia semperflorens* Link and Otto as test crop in a pot culture experiment. The coir pith was combined in a soil breeding experiment with shola leaf mould and sand and these were compared with the conventional medium consisting of shola leaf mould, sand and laterite soil. The physico-chemical properties of the media combinations were analysed. The growth and flowering parameters were recorded at monthly intervals for 3 months. The results indicated that coir pith can be effectively utilised as a potting medium to raise *B. semperflorens* in containers. The indications were clear that 60 per cent coir pith: 20 per cent shola leaf mould: 20 per cent sand encouraged growth and flowering of the container - grown *B.semperflorens*. This improvement in growth and flowering can be attributed to the increase in WHC and CEC and low bulk density and particle density of the medium.

KEY WORDS : Coir pith, Potting Medium, *Begonia*

Container - grown plants require growing medium with good physical and chemical environment for their growth. An efficient medium must be sufficiently firm and dense to hold plants, sufficiently retentive of moisture and porous (Hartmann and Kester, 1978). Considerable research has been carried out on the use of organic waste such as saw dust, manure, sludge, date palm leaves (Aborady *et al.*, 1987), pecan shells (wang and Pokorry 1989) and pine bark (Asron, 1991) in the preparation of pot mixtures. Coir pith is a nondisposable waste product of the coir industry. In the process of investigation on the disposal of certain waste products, this has also received research attention. Its use as a soil conditioner in tropical farming is well established (Nagarajan *et al.*, 1990). *Begonias* as a group love organic matter, a constant supply of moisture without

Table 1. Physico-chemical properties of pot culture medium

Medium	Bulk density (gml^{-1})	Particle density (gml^{-1})	Pore space (%)	Max WHC (%)	CEC me 100 g^{-1}
Coir pith (a)	0.33	0.57	18.3	80.3	22.5
Shola leaf mould (b)	0.71	1.00	25.0	78.3	65.0
Sand (c)	1.30	2.50	46.6	12.5	7.0
a:b:c (v/v)					
8:1:1	0.54	1.30	24.3	53.0	18.0
3:1:1	0.66	1.10	26.6	38.2	22.7
2:1:1	0.66	0.76	22.0	40.8	20.0
4:3:3	0.83	1.66	25.8	37.2	16.0
b:c:laterite 1:1:1	1.10	2.00	30.2	18.4	18.5

WHC ; Water holding capacity; CEC : Cation exchange capacity.

compromising on good drainage. Keeping these in view, an attempt is made in this study to utilise growing medium for container-grown begonia.

MATERIALS AND METHODS

A pot culture experiment was conducted at the Horticultural Research Station, Tamil Nadu Agricultural University, Kodaikanal (altitude of 2223 m MSL with a maximum temperature range of 14 to 25^{0}C and minimum temperature range of O to 17^{0}C) to study the suitability of coir pith as growing medium to raise container - grown begonia. The coir pith was allowed for themophillic bacterial fermentation in heaps for three months and used after leaching with water. The conventional growing medium made of Shola leaf mould; sand; laterite (1:1:1 v/v) was compared with coir pith : shola leaf mould : sand in varying proportions on volume basis. The following physico-chemical properties of individual components and different mixtures were analysed : bulk density, particle density, percent pore space, water holding capacity and cation exchange capacity. These media as treatments numbering six were replicated six times under completely randomised design as follows:

(1) coir pith : shola leaf mould : sand 80:10:10

(2) 70:15:15

(3) 60:20:20

(4) 50:25:25

(5) 40:30:30 and

(6) check - shola leaf mould : sand : laterite 33.3:33.3:33.3. All these pots received uniformly 25 g of mixtures of neem cake : diammonium phosphate : potash (3:1:1 w/w) as the pot mixtures were inadequate from the stand point of nutrition. The investigation was initiated in May, 1992 with one - year old rooted cuttings of a rose - flowered clone of *Begonia semperflorens* Link and Otto which is very popular and easily grown at this altitude. The performance was assessed during the peak flowering phase at monthly intervals from July to September and the data thus collected were statistically processed.

Table 2. Performance of *B. semperflorens* at progressive growth stages (mean on various media)

Date of observation	Primary laterals No. pot^{-1}	Secondary laterials No. $plant^{-1}$	Flower clusters No. $plant^{-1}$	Flower No. $cluster^{-1}$
(19.7.92)	2.8	2.0	1.8	4.6
(20.8.92)	4.3	2.2	2.8	4.5
(20.9.92)	6.3	3.4	3.1	4.6
CD (at 5%)	0.6	0.2	0.3	N.S.

RESULTS AND DISCUSSION

It could be observed (Table 1) that the percentage pore space, particle density and bulk density were found to be high and water holding capacity (WHC) and cation exchange capacity (CEC) were low for the conventional medium. The medium containing coir pith : shola leaf mould: sand (60:20:20 and 50:25:25 v/v) had higher CEC and WHC. Due to the addition of coir pith, the bulk

Table 3. Performance of *B. semperflorens* under different growth stages (mean of 3 stages)

Medium	Side shots No. plant^{-1}	Brances No. plant^{-1}	Clusters No. plant^{-1}	Flowers No. clusters^{-1}
Coir pith : shola leaf mould : sand				
8:1:1	2.9	2.1	1.8	4.5
7:1.5:1.5	4.5	2.7	2.5	4.9
3:1:1	7.3	4.0	4.2	5.2
2:1:1	5.8	2.9	2.6	4.5
4:3:3	3.9	1.9	2.0	4.2
Sola leaf mould : sand : laterite (Check)				
1:1:1	2.4	1.6	2.0	3.7
CD (at 5%)	0.8	0.3	0.5	0.4

density decreased and this would result in an increase in aeration, porosity, and friability in the medium all contributing to enhanced performance of *B.semperflorens*. As was stated earlier the begonia group of plant species love organic matter, constant moisture supply and good drainage. The addition of coir pith seemed to satisfy the above requirements. Increasing proportion of sand resulted in diminished moisture retention. A reasonable improvement in the WHC and CEC was obtained for the medium consisting of coir pith : shola leaf mould : sand (60:20:20 and 50:25:25 v/v) over the conventional medium. It should be remembered here that both these parameters were highly influential in promoting growth of container-grown plants (Aborady *et al.*, 1987).

The observations on growth and flowering of *B.semperflorens* (Tables 2, 3) indicated that the growth as reflected in number of branches and side shoots was appreciably high for the medium consisting of coir pith : shola leaf would : sand (60:20:20). The laterals, both primary and secondary and flower clusters were found to increase progressively upto three months after planting. The number of flowers per cluster remained the same, showing that the treatments had no influence on this character evidently due to the genetic make-up of the species in this experiment. Irrespective of stage of observation, the treatment combination of coir pith : shola leaf mould : sand in the ratio of 60:20:20 gave increased number of primary and secondary laterals, flower clusters per plant and also an added number of flowers per plant. Lokesha *et al* (1988) reported high percentage of rooting of acalypha and bougainvillea in coir dust medium as compared to sand or soil + organic manure. They attributed this to the root inducing property of the coir dust. But the results of Wang and pokorry (1989) are very pertinent here. They used hammer milled pecan shells with promising results in the preparation of pot mixtures by soil breeding to raise *B.samperflorens* and *B. cucullata*. The growth parameters recorded in this study declined in count in the plants raised in conventional medium of shola leaf mould : sand : laterite (33.3:33.3:33.3 v/v). This can probably be due to its high bulk density and particle density coupled with low CEC and WHC (Table 1) This studies thus showed that coir pith can be an effective constituent of the potting medium for raising *B.semperflorens* and it can be used upto 60 per cent (v/V) along with shola leaf mould (20%) and sand (20%)

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