DEPARTMENTAL AND OTHER NOTES

PROGRESS OF BALSA CULTIVATION IN CEYLON

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IT is only two years or so ago that real interest was raised in the subject of Balsa cultivation in this country, the interest being since stimulated by urgent requests from Australia for this wood and in the knowledge that a first class quality of wood can be grown here if given right conditions, and to the fact that a high quality wood will always find a remunerative market.

The history of the tree with a brief description of its uses was published in the Tropical Agriculturist, Vol. XCII., No. 1 of July, 1941. Since then a deal of additional information has been gained and experiments undertaken. For a new subject, extensive stocks have been raised and distributed, with a leaflet describing the plants cultural requirements and other points demanded for its successful cultivation.

From the date that new interest was shown in this subject of Balsa Wood all garden seed-bearing trees were utilised for raising stocks, and to date the seedlings in plant baskets disposed of have amounted to well over 12,000 together with a distribution of nearly five pounds of seed, one ounce of seed representing about 3,000 seed. This has however not been sufficient to meet the demand and many orders have had to be curtailed or refused.

It is difficult to estimate from these figures exactly what acreage there is in Balsa at the moment. The seed germinating percentage, for instance, is in all cases very poor, rarely more than fifteen and often as low as five per cent. A further percentage of the seedlings raised have doubtless been lost due to damping off, though this can be reduced by dustings with flowers of Sulphur and other means in the early stages. With the basketed plants a planting percentage of nearly one hundred can be secured if the plantation adjoins or is near the nursery, but if lengthy transport is involved losses again occur owing to the succulent and sappy nature of the seedling which bruises very easily and wilts away quickly. After the planting out of sound and healthy seedlings, however, all should be well, and growth should be rapid, but the necessity for an insecticidal spray for the first month or six weeks arises, during which period insects are attracted to them. Once having formed their rough leaves they fend for themselves.

Another factor in estimating acreage at the moment is the spacing of the plants. Some are planted 10 ft. by 10 ft. (435 to acre) some 15 ft. by 12 ft. (242 to acre) and some larger spacing than this. It seems, however, that 12 ft. by 15 ft. is likely to be the more economical in spacing, as figures given below indicate.

The main point to bear in mind in Balsa planting is that if full returns are required the trees must produce very light wood, and that this is only obtained by quick growth under favourable conditions of ample moisture, a friable and loose soil and an elevation of under 2,000 feet.

The Council for Scientific and Industrial Research of Australia have recently stated that, " the lighter weight Balsa received in Australia, *i.e.*, material below about 9 or 10 lb. per cubic foot, goes to the aeroplane factories while the heavier material, up to 15 lb. per cublic foot, is supplied to the Navy for floats ". This can be taken to apply to Balsa Wood for all countries, and low density wood of 7 to 8 lb. per cubic foot will obviously be much more marketable than the heavier wood.

The fear that Balsa may be grown here under unsuitable conditions is a very real one and too much emphasis cannot be given to soil and moisture requirements. For this purpose a useful pamphlet including and particularly defining site conditions has been sent out with every consignment of plants or seed. It is these points that the figures of our trial plots given below are intended to elaborate in conjunction with spacing trials, for rapid growth is the essence of the whole matter. A good criterion to every grower in this respect, therefore, is to what extent his plantations at one year of age compare with the figures given of the garden trees of the same age. They should approximate to this height and girth if marketable light wood is to be secured at 5 to 6 years of age, and the produce to be to the estimated amount of 25 cubic feet per tree.

On October 6th, 1941, a batch of 100 four-month old seedlings were planted for trial purposes in the river bank of the Royal Botanic Gardens. The site is 20 feet above normal river level and consists of washed sand thrown up by the river at times of flood with a very small percentage of humus, since accumulated.

Holes 3 ft. by 3 ft. were excavated and in refilling 3 baskets of rotted cattle manure and 2 of normal garden soil was added. Growth was free and rapid from the start but caterpillar attacks being observed soon after planting out, weekly sprayings of Arsenate of Lead (one oz. in one gallon of water) were given each week for 4 weeks, after which the older and rougher leaves themselves combatted any attack. The planting distances of this batch was 10 ft. by 10 ft.

On October 6th, 1942, a second batch of four-month old seedlings, this time of 30 plants, were put out in an adjoining area of the same soil conditions and given the same preparations and other treatment as for the 1941 plantation. The planting distances of this second batch was however 12 ft. by 15 ft. as the purpose of this planting was particularly to compare advantage in height and girth, if any, due to the wider spacing. Atmospheric conditions during the first year's growth of each batch were remarkably alike. 100·22 inches of rain were recorded on 204 days during the period October, 1941, to September, 1942, and 103·15 inches on 205 days during October, 1942, to September, 1943.

The normal habit of the plant is to form a stout straight main stem of about 8 to 9 feet, at which height it branches into 3 stout angular lateral branches, one of which takes the lead whilst the other two remain as laterals. Subsequent growth is in sequence of such branching and the main stem

sections between such branching varies from 5 to 6 feet to 7 or 8 feet according to whether the tree is grown individually or in close plantation.

With an idea of obtaining as much straight wood free from branch knots as possible, the trees in both batches were at the time the branch shoots were first perceptible, pruned back to one leading branch only. The results were not too successful for not more than a third of the plantation responded to this treatment by formation of an approximate straight stem as was expected of from 16 to 18 feet, the remainder showing a very decided kinked appearance with a top stem of semi-lateral type growing at various angles from the perpendicular. These latter are, however, slowly straightening and some may yet overcome the error of pruning back.

A third planting, this time of 60 four-month old seedlings, was therefore made on *October 6th, 1943,* under exactly the same conditions as the two former batches and these will be grown on untreated and allowed to take their natural shape. The planting distances of this batch is again 12 ft. by 15 ft. as for batch 2 and this close planting should, judging by past experience, encourage elongation of the main stem to 10 or 12 feet before first branching, with inter-branching growth of useful dimensions also.

Records of batches 1 and 2 are now set out and those of batch 3 will be recorded in due course, at one year of age and subsequently.

Plot 1.—Planted on *October 6th, 1941,* 100 plants 10 ft. by 10 ft. seedlings *4 months old and 6 inches in height.*

	Height.	Girth at base.	Girth at 3 feet.
Average on Oct. 6, 1942 (12 mns.)	20′·4″	1′·3⅓″	0′·11⅓″
,, ,, Jan. 6, 1943 (15 ,,)	23′·0″	1′·5½″	1′·1¾″
,, ,, Apr. 6, 1943 (18 ,,)	27′·9″	1′·6½″	1′·3″
,, ,, July 6, 1943 (21 ,,)	28′·10″	1′·8¾″	1′·4½″
,, ,, Oct. 6, 1943 (24 ,,)	34′·4″	1′·9¾″	1′·5″

The tallest individual trees in this plantation on October 6, 1942, *i.e.*, at one year of age were Nos. 51 and 52 with a height of 25 feet and that of the largest girth being tree No. 45 with a circumference of 1 ft. 1½ in. at 3 feet from ground.

On October 6th, 1943, i.e., at two years of age the tallest specimens in the plantation were Nos. 34 and 36 with a height of 41 feet and the tree of largest girth was No. 1 with a circumference of 2 ft. 1½ in. at 3 feet from ground.

Plot 2.—Planted on *October 6th, 1942*—30 plants 12 ft. by 15 ft., seedlings *4 months old and 6 inches* high—

	Height.	Girth at base.	Girth at 3 feet.
Average on Apr. 6, 1943 (6 mns.)	8′·7½″	0′·8¾″	0′·6″
,, ,, July 6, 1943 (9 ,,)	14′·10″	1′·1½″	0′·10¼″
,, ,, Oct. 6, 1943 (12 ,,)	20′·10″	1′·5½″	1′·2″

The tallest individual tree in this plantation on October 6th, 1943, *i.e.*, at one year of age was No. 18 with a height of 26 feet and the largest in girth at 3 feet from ground was No. 25 with a circumference of 1 ft. 6 in. at 3 feet from ground.

As soil and climatic conditions are so similar for the two plots the advantage of wider spacing in plot 2 (12 ft. by 15 ft.) over plot 1 (10 ft. by

10 ft.) at one year of age is plainly indicated. This advantage to the plot No. 2 will in all probability be considerably enhanced in its second and subsequent years of growth.

Once again, therefore, the main considerations in Balsa cultivation are a proper selection of site with a light well drained sandy soil, secondly, suitable climatic conditions, and thirdly suitable spacing, and these requirements are again emphasised. Without such conditions one must expect a slower root formation with slower growth and a resultant heavier timber. Sites embodying these requirements are not easy to find and are generally found in narrow and elongated river bank strips. The volume of some orders received and the locality in which they are to be grown indicate that the grower is at present not giving sufficient attention to these needs.

Observations made from a few trees growing in and outside the gardens, in normal tea and rubber land soil, show that other than a light sandy soil is detrimental to any rapid growth and therefore lightness of timber. Individual trees in such a comparison are not a scientific test of course but they point the way.

Of the Gardens earlier planting made in *1931* in river bank (light sandy soil) and in Gardens Section D (heavy loamy soil), those in the river bank felled between June, 1941, and June, 1943, ranged from 7 ft. 6 in. to 9 ft. 1 in. in girth at base whilst the Section D tree has to date attained a girth at base of 5 ft. 8 in. only. This latter rate of growth and girth corresponds very approximately to that of isolated trees found elsewhere in the Island. It is too slow to produce any very light wood. A Balsa seedling planted in Section H of the gardens (in a fairly heavy soil) on December, 1940, has to date attained a girth circumference of 1 ft. 1½ in. only in the two year and 10 month period, and this seems normal under these conditions. Comparison of this plant with those in either of the river side plantations show the very appreciable advantage of a light sandy soil.

The experiments with Balsa to date certainly appear to warrant the conclusion that the required dimensions will be attained in the anticipated period of 5 to 6 years, the more so in that the garden river bank soil conditions are very poor in humus content.

At Pallekelly and at Wattegama seedlings put out in October, 1941, at the same time and of the same age as our own, but in a light sandy soil of more humus content, have in their largest specimens exceeded both height and girth of the largest plants in the garden plots.

Peradeniya, 13th November, 1943.