

YOUNG BUDDING - A BETTER PLANTING MATERIAL

Priyani Seneviratne

In the early years, rubber plantations in South-East Asia were established from unselected seeds. As a result, trees in such plantations were highly variable in vigour and yield. The clonal seeds were slightly better than unselected seeds but the need for a vegetative propagation method was very important mainly due to the uneconomic yield and long life span of the holdings. Experience with rooted cuttings revealed, no encouraging results because of the difficulties in inducing roots on cuttings and then the fact that the poor anchorage provided by these fibrous root systems, specially when the trees are fully grown.

Development of the bud grafting technique for rubber was a real breakthrough in improving the planting material for the establishment of plantations and also the rubber plantations became more economical. For the production of budded stumps, two types of nurseries are required, namely seedling or rootstock nurseries to generate rootstocks and budwood nurseries to harvest bud patches. Rootstock nurseries are established every year from the seeds collected during the seed fall. As far as budwood nurseries are concerned, over the years, a large number of clones have been produced and they are maintained as source bush or budwood nurseries. Clones are generally named by a number preceded by letters indicating its place of origin.

Buddings are always superior to seedlings of any nature, when considering the uniformity in the growth and finally in the yield. The only disadvantage of buddings over the seeds is the involvement of nursery management and the cost incurred. However, this is compensated by the high yields and profitability of the buddings.

The earlier technique of brown budding which required at least one years growth of stock plants, was less practiced due to the advantages of green budding technique such as reduced rootstock nursery time up to about 6 months and thereby the reduction in cost.

Planting either type of budgrafts as bare root budded stumps is cheaper, but at the same time it has the disadvantage of low field establishment rate and also uneven growth in the field. Both these factors finally contribute to the low stand at the commencement of tapping and thereby the poor yield per hectare. The variation in the yield due to uneven growth is again a loss to the planter due to the fact that even a low percentage of the stand, is very low yielding. Combe (1975) estimated the variation in growth of eight year old trees and reported that 25%, 15% and 10% of trees of clones RRIM 607, PB 86 and PR 107 respectively never came to tapping. Further, it had been shown that 50% of the total yield was harvested from 34%, 36% and 38% respectively of clones RRIM 607, PB 86 and PR 107. These results show that even with the use of budded plants there is high variability in growth and yield,

within the same clone. The extent of variability was studied by Senanayake (1975) in a monoclonal stand of eight year old trees of RRIC 88 and reported the coefficient of variability for the yield to be 27.2%.

This kind of variation has to be expected in any population of budgrafts, as bud grafting is only a partial vegetative propagation method. However, this variation may be reduced to a considerable extent by selecting vigorously growing individuals. This selection procedure should be done at every possible stage, *ie* from the seeds up to the plants that are used for field planting. The final step of selection cannot be done if bare root budded stumps are used for planting.

Planting bare roots in polythene bags prior to field planting, is beneficial as it allows the planter to select better growing plants for field establishment. Uniform growth in the field can be achieved by this kind of selection and also by 100% field establishment rate even in relatively dry areas. The latter minimizes the requirement of filling vacant points during the first 2-3 years. If polybag plants are transplanted carefully, to the field, the root system remains undisturbed and this helps the scion shoot to continue its growth with no setback. Normally polybag plants are planted at 2-3 leaf whorl stage, but the plants can be grown in bigger bags to be kept for a longer period *ie* up to about 5-6 leaf whorl stage, and by using this type of planting material, the immature period can be reduced by about one year.

Young buddings are also a kind of polybag plants and therefore they carry all the advantages of ordinary polybag plants. In addition, as germinated seeds are planted directly in bags, the root system of young buddings are undisturbed and as we are all aware, this is very important for the establishment and growth of the rubber tree. Further, the land preparation involved in establishing rootstock nurseries which is required for normal green or brown budding is not required for young budding, as germinated seeds are planted directly in bags.

Young buddings, as the name implies, are budgraftings done on very young stocks of about 2-4 month old. The low cost of production in young budding is coupled with the shorter period involved in the production of plants; the whole operation to produce 2-3 leaf whorled plants takes only 8-9 months. Also, the technique ideally suits with the local conditions of seed fall and main planting season which is the monsoon rainy period in May-June.

Furthermore, young buddings give the guarantee that root diseases are not taken with them and introduced to the field, as the young buddings are not grown in a ground nursery where the soil could have been contaminated with debris of roots containing pathogens such as *Rigidoporus lignosus* which causes deadly white root disease.

It is clear that the production of young buddings is very much advantageous in every respect. The cost of production is low compared to normal polybag plants of green or brown budded. It is evident that the cost of production of a 2-3 whorl young budding is comparable to that of a bare root brown budded stump.

Evidently, both the nurserymen and the farmer are equally benefitted by producing and using young buddings. The budding technique is similar to green budding. Normally stock plants of about three months old are budgrafted around December. Once the stock plant is cut, *ie* after about one month after grafting, the scion bud starts growing and a period of about 4-5 months is given, for its growth in the bag, before it is transplanted to the field.

Compared with the portion of the stock plant which is cut and removed in normal brown or green budding, the waste is minimal in young buddings making sure that almost all of the inputs such as fertilizer gone in to the stock plant will contribute the growth of the scion. The smaller size of the bag and the plant is an added advantage in young buddings, as it makes handling and transportation easy.

Our experience so far on field planting of young buddings of clones RRIC 100, RRIC 102 and RRIC 121 showed 100% field establishment. The growth in the field was more uniform and, in fact leading after 2 years of growth when compared to all other planting materials. Countries like Malaysia who certainly has more experience in using young buddings as a planting material, recommend young buddings as a superior planting material (Ong *et al*, 1989). However, it should be finally mentioned here that the successful use of young buddings, requires proper planning and better management throughout the nursery period, in order to obtain the full benefit.

REFERENCES

- Combe, J C (1975). (Demonstration of intraclonal variability in young grafted trees) Mise en'evidence de la variabilite' intraclonale sur de jeuner greftes. *Reveu Generale Caoutchous et Plastiques*, 52: 91-94.
- Senanayake, Y D A (1977). Yield variability in clonal rubber (*Hevea brasiliensis* - muell-Arg). *Journal of Plantation Crops*, 3 (2): 73-76.
- Ong, T S, Heh, W Y and Wong, C P (1989). Young Budding - Commercial experience in a large plantation group. *Proceedings of the Rubber Growers Conference*, pp. 110-124.

Plates

1. Germinated seed - correct stage to be planted in bags.
2. The young budding nursery at bud grafting - about 3 months old seedlings.
3. A successfully grafted plant - technique is green budding.
4. A young budding plant with 2 leaf whorls.

