A METHOD TO REDUCE MORTALITY RATE IN RAMBUTAN GOOTEE LAYERS

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Rambutan (Nephelium lappaceum.L.) is one of the most delicious fruits in Sri Lanka. Rambutan can be propagated by seed, layering, budding and grafting. Propagation by seeds, unless for stock plants, is not recommended since it creates several disadvantages such as (1) seedling trees have longer vegetative phase prior to reproductive phase, (ii) uncertainity of genetic uniformity due to open pollination, (iii) the possibility of increasing the proportion of male trees and (iv) decrease in the number of trees per unit area due to wider spacing between trees. Hence vegetative methods of propagation are used to overcome these disadvantages.

Stock plant production by seed is restricted due to seasonal availability of seed and inability to handle large quantities of seed which have a very short viability period. Hence the method of air-layering can be adopted.

Method of Air Layering:

Air layering or marcotage or gootee layering is one of the ancient propagation techniques used to propagate rambutan. The method of layering does not demand any specialized skill.

10 to 18 months old terminal branches, 1-3 cms. in diameter and 60-80 cms. in length are suitable. Two horizontal circular cuts 2-3 cms. apart are made around the branch in the region of semi-hardwood. The strip of cortex between these two cuts is removed by a vertical cut joining the horizontal cuts and the cambium is scraped To make these horizontal circular cuts, a partly split whole piece of bamboo can be used. In th is method the twig is inserted between the split bamboo and the bamboo is twisted from side to side to make the cuts and then remove the ring of bark (Figure 1)

Once the bark is removed, the wound is allowed to dry and callus for 2-3 weeks. Subsequently the callused wound is covered with moistened coirdust made into a ball around the part where the ring of bark is removed. (Figure 2).

To keep the ball of coir dust in position around the wound, wrap the ball with a piece of 300 gauge polythene sheet. This must be bound tight by using metal binding wire.

After layering, 3-4 weeks are needed to produce a good ball of roots. September, October, November and December are the best months to induce rooting. When gooteeing is done during these months, maximum rooting can be obtained.

The rooted twig is notched below the gootee to reduce shock and mortality. Then the twig is separated from the parent tree at 2 weeks after notching. These are potted in 1:1:1 normal potting mixture of top soil, compost and sand. Care should be taken when these gootees are handled at potting. Damaging of roots must be avoided. After potting, these plants must be thoroughly watered and kept in shade for a few weeks.

Eventhough a good ball of roots is formed, bud break after potting, is very low or in many cases completely absent. If bud break does not occur within 2 weeks after potting, leaf senescence progresses resulting in the die back of the potted gootees. This results in high percentage failure. A few of these potted plants would survive for more than 1½ years in the pots without producing new shoots and then gradually die. Due to this, the adoption of the technique of gootee layering for large scale production of plants was severely restricted. Hence a method to reduce casualties had to be developed.

Method of Inducing Bud break and reducing casualties.

Inducing bud break is a possible remedy to prevent failures. A large number of studies in several aspects were done at Fruit Research Farm, Eraminigolla. These studies included leaf pruning, time of gooteeing, time of potting, potting mixtures etc.

These techniques did not give significant results in reducing the mortality rate of these plants. Therefore a simple technique of inducing bud break was evolved. This method is as follows:-

It is very essential to select an undamaged, healthy bud as close as possible to the base of the layering twig. Make a shallow notch about 1/4 depth of the diameter of the twig, 1-2 cms. above the selected plump bud. Then the gootees can be potted as mentioned earlier. If the twig is large then it can be topped to half of its size, usually about 30 cms. in height, but to include a few leaves. Depending on the status of the bud, the bud just below the notch will break and produce a new vigorous shoot within a very short time. If the selected bud is not in a proper development stage or unhealthy, it will take a longer period for bud break. Once the bud grows, it is tied to the upper portion of the plant to train it and prevent damage. The layer is topped at the point of notch after hardening. A suitable wound dressing is used at the cut end to prevent die back. (Figure 3).

When gooteeing is done during the period September to December, it would take around 3 months to produce a salable plant.

The success of this notching technique shows that the normal leaf senescence after potting is completely stopped and that the twig tries to depend on its own root system for sustenance. Success in producing healthy plants by this method has been in the range of 70-75%.

Hence gootee layering, adopting this technique is recommended for production of rambutan plants. This technique which does not involve special skill and is quite economical with regard to labour and time is ideal for mass production of rambutan.

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STEPS IN AIR LAYERING RAMBUTAN

1. Select an erect twig about 2-3 cms. diameter, bearing a few leaves.

2. Ring bark in the region of semi hardwood, removing a ring of bark about 2-3 cms.

3. Allow the ring barked area to callus for 2-3 weeks.

4. After 2-3 weeks, the injured area is covered with moist coir dust formed into a ball and held in position with 300 gauge polythene sheet and bound tightly.

5. After 2-3 weeks a notch is made 1-2 cms. below the gootee to a depth of about 1/4 the diameter of the twig. Support the twig to avoid breakage.

6. The twig should be severed from the parent two weeks after notching.

7. Before potting the layer, a healthy, undamaged bud should be selected as close to the base of the layer as possible and a notch made about 1 cms. above the selected bud.

8. The layer is now potted after topping any excess length of twig to about 30 cms.

9. Water the potted layers and place them in shade.

10. Pests should be controlled when necessary.

11. Bud break occurs 2-3 weeks after potting.

12. Train the new shoot to grow erect.

13. When the shoot reaches semi hard wood stage of maturity, harden the layer progressively.

14. The layer is ready for planting in the field in 10-12 weeks from ring barking.

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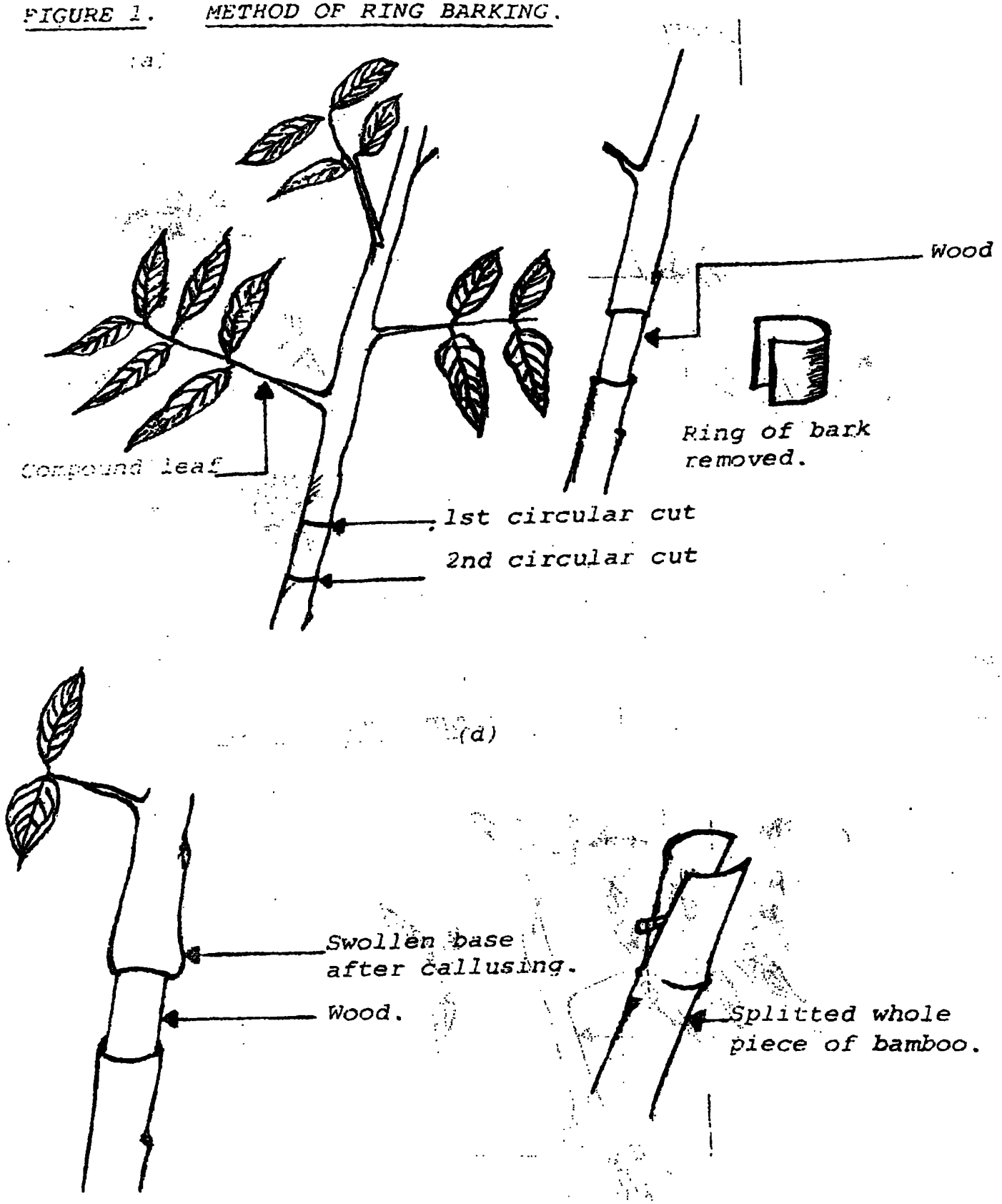
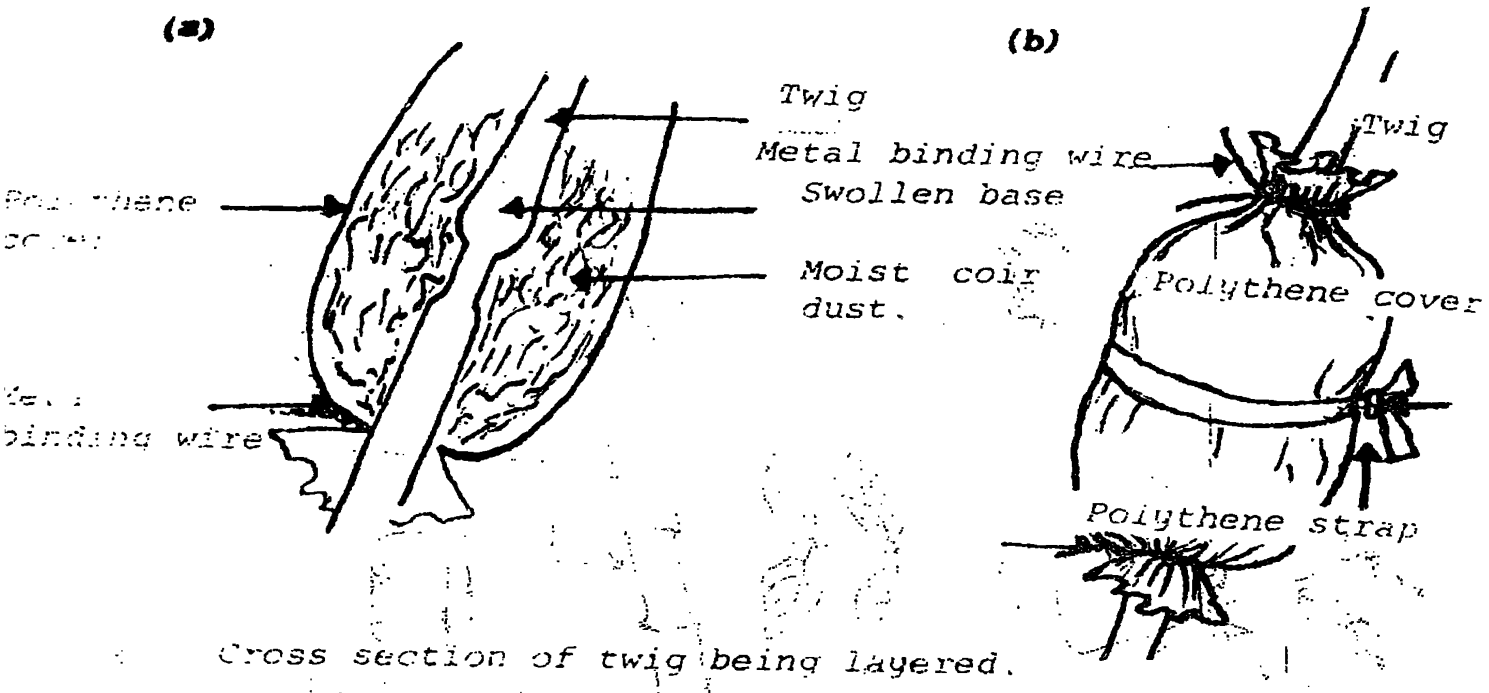
FIGURE 1. METHOD OF RING BARKING.



(a) Selected twig showing place of ring barking.
(d) Twig after ring barking.
Appearance of twig at 3 weeks after ring barking.
Splitted whole piece of bamboo.

FIGURE 2. PLACEMENT OF ROOTING MEDIA.

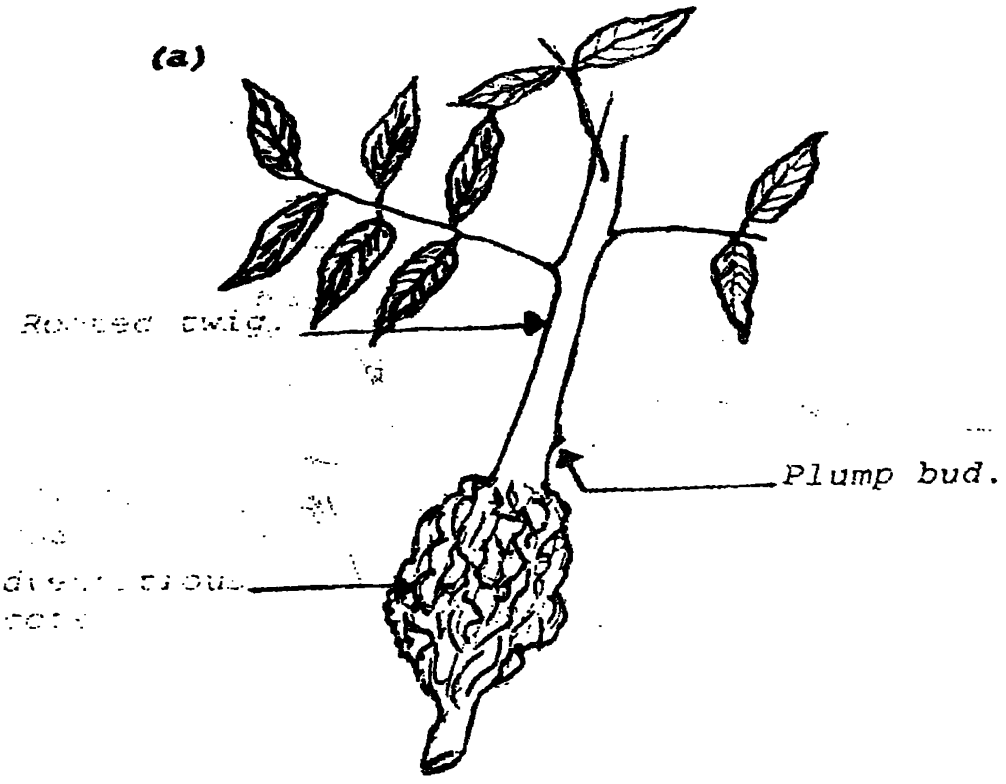


a Cross section of twig being layered.

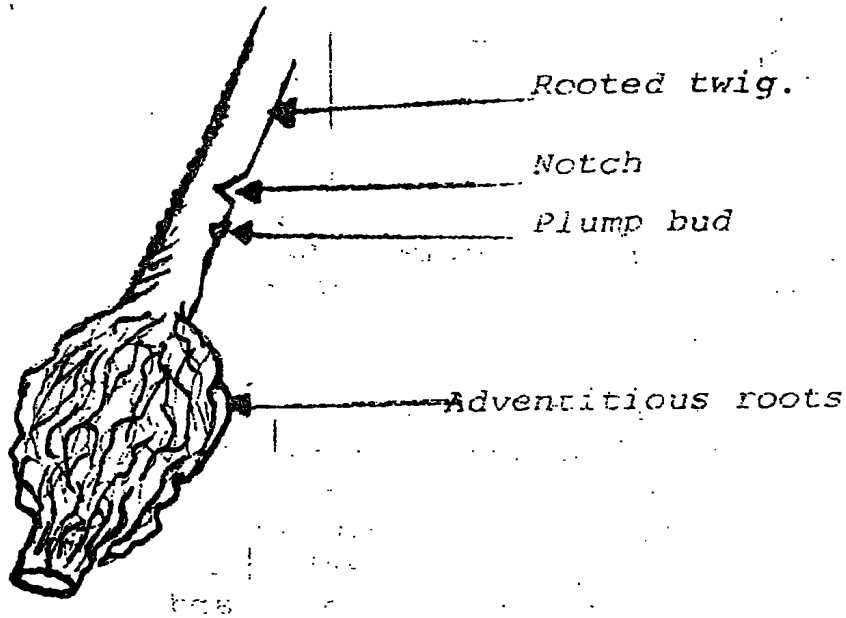
b The twig after layering.

FIGURE 3.

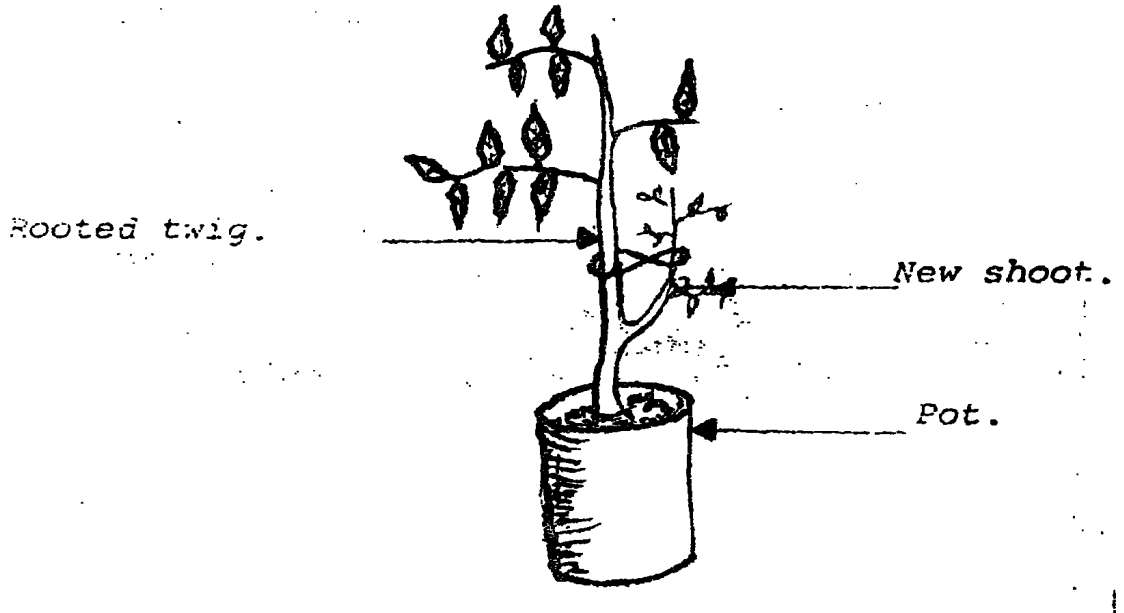
METHOD OF NOTCHING OF ROOTED TWIG AT THE TIME OF POTTING



(b)



(c)



(a) Rooted twig.

(b) Method and place of notching at the time of potting.

(c) Training of the new shoot.