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UNIFORM AND EARLY SPROUTING OF YOUNG BUDDINGS AND BUDDED STUMPS OF RUBBER

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The early bud emergence is important specially when bare root budded stumps are planted in the field. If the bud emergence is delayed, the unfavourable weather may set in before the plant is established in the field.

Once a budgraft is successful, removal of the stock plant above the grafted bud is required for the emergence and the growth of the grafted bud or this will remain dormant as long as the stock plant remains intact. The length of the snag has an influence on the time taken for sprouting. For brown and green buddings the recommended length of the snag is 10 and 15 cm respectively and the stock plant is removed after 4 weeks of bud grafting. For young buddings cut back time is about 5 weeks after bud grafting and a longer snag, about 25-30 cm with some leaves attached is recommended. With longer snags, the growth of the scion shoot is better but sprouting gets delayed and also sprouting becomes very uneven, partially due to improper nicking. Because of this, for young buddings also, a shorter snag is recommended provided that the growth of the stock plants is satisfactory.

The effect of cut back time

As young budded plants are produced in relatively a short period of time, both early as well as uniform sprouting is essential for the scion to receive a longer growth period before the plants are transferred to the field. Also, if sprouting can be advanced, then bud grafting can be further delayed and rootstock plants will have a longer period to grow and reach the buddable girth. In order to see whether the sprouting could be advanced by advancing the cut back time, following treatments were tested.

	Cut back time (after bud grafting)		
	4 weeks	2 weeks	0 weeks
Snag 30 cm + 3 leaves	Tr. 1	Tr. 3	Tr. 5
Snag 15 cm no leaves	Tr. 2	Tr. 4	Tr.6

Plants were raised in 7"x18" polythene bags filled with top soil. Bags were arranged in shallow trenches in single rows spacing 1½' between rows. Germinated seeds of mixed clones harvested from the germination bed were planted in bags in early September. Manuring, disease control etc. were carried out according to the recommendations (Advisory Circular No: 1994/01- Young Budding). All plants were bud grafted in late December at the age of about 3½ months with green budwood of clone RRIC 121. There were 50 plants for each treatment.

Sprouting dates were recorded for each treatment and the percentage sprouting is shown in Figs 1a and 1b. The cut back time had no influence on the percentage sprouting and number of successful plants, when the snag was long and with leaves (Fig 1a). But sprouting was not uniform and all three treatments showed a similar pattern lasting for about 8 weeks. But sprouting started earlier when the stock plants were cut back at the time of bud grafting and this showed no adverse effects on the bud grafting success. Nevertheless, removing the stock plant either at 2 weeks or 4 weeks gave similar results.

With shorter snags, removing of the stock plant at the time of bud grafting was a failure; only one plant out of the 50 survived beyond 2-3 weeks (Fig.1b). Again, cut back time of 2 weeks and 4 weeks showed similar results, early and uniform sprouting.

As far as the lengths of the scions are concerned, cut back at 15 cm after 2 weeks showed the least mean length. Plants with longer snags and leaves produced larger scion shoots; this has been reported earlier also (Seneviratne, et al, 1994). The cut back time, i.e. 4 weeks, 2 weeks or 0 weeks, showed no significant difference on the growth of the scion . The mean lengths of all 5 treatments were in the range of 70-82 cm 24 weeks after cut back (Fig.2). The mean diameter was also low when the snags were short and high with long snags containing leaves but the differences were ery small (Fig.3).

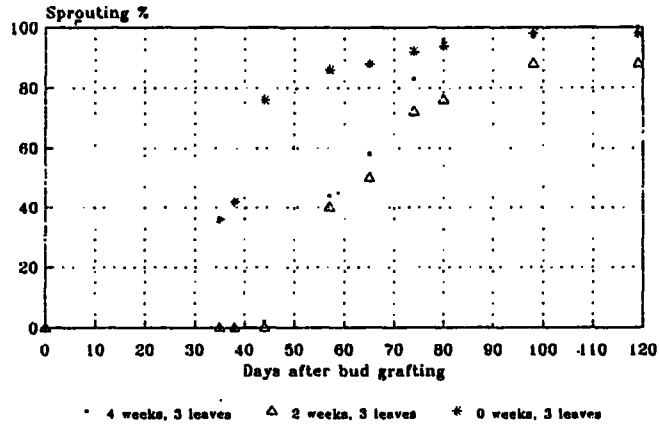

Fig.1a

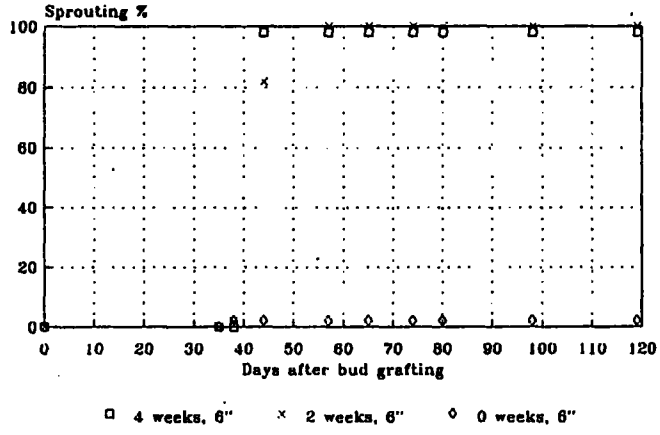

Fig.1b

Fig.1. Percentage sprouting for three cut back times (a). when the snag was 30 cm and leaves attached and (b). when the snag was 15 cm and contained no leaves.

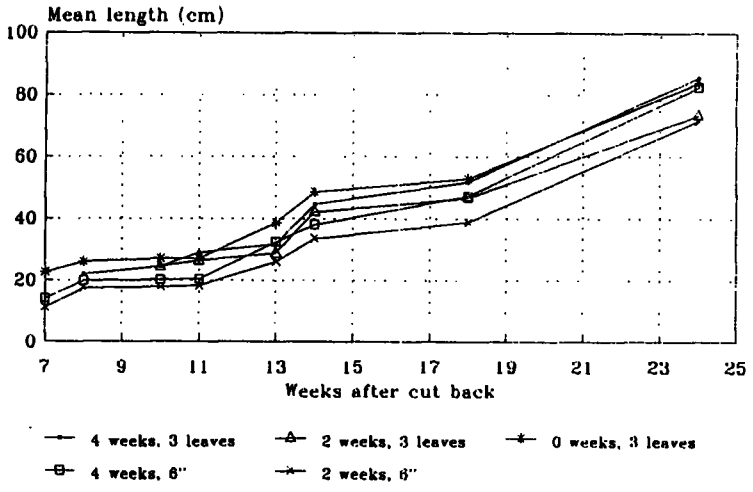

Fig.2. Mean length of the scions of the two snag treatments and three cut back times.

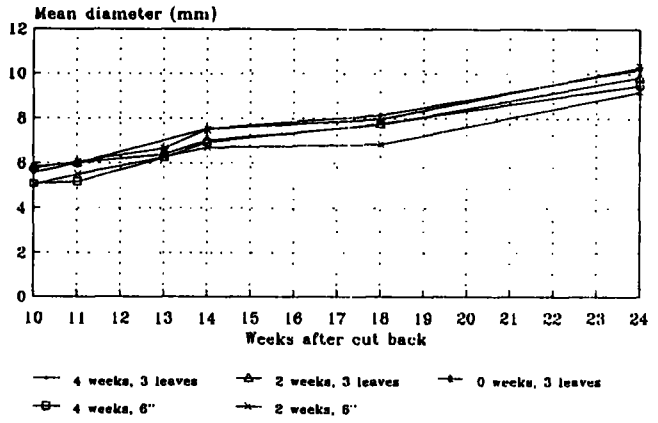

Fig.3. Mean diameter of the scions of the two snag treatments and three cut back times.

The effect of thiourea

In this trial a solution of thiourea (Thiocarbamide, CH_4N_2S) was applied on the grafted bud. The chemical was supplied by Sigma Chemical Co, USA, and 2% solution was used for this trial. Green budded stumps of clone RRIC 100 and RRIC 130 grown in 7"x18" were used. Following three treatments were tested in this trial.

Tr.1 - Daily application for 1 week.
Tr.2 - Four applications every other day.
Tr.3 - Two applications weekly.

Thiourea mixture was sprayed directly on to the bud patch with a hand sprayer. For RRIC 100, there were 25 replicates and for RRIC 130 replication was 45. Results on percentage sprouting is shown in Figures 4 and 5.

For both clones, sprouting percentage is higher in treatment 2, 95.6% and 100% for RRIC 100 and RRIC 130 respectively. However, the effect is more pronounced in RRIC 130; from the third week onwards, the sprouting percentage is higher in treatment 2. The statistical analysis carried out also showed a significant difference among treatments ($p=0.007$) during the period of 5-6 weeks. The differences between treatments suggests that there is a positive effect of thiourea on sprouting of buds. Anyhow, lack of a control treatment prevents firm conclusion.

DISCUSSION

The time taken for sprouting is influenced by the cut back time and the snag length. As the bud grafting success was not affected by the cut back time, removing the stock plant at the time of bud grafting can be practiced with long snags containing leaves and will be advantageous. Nevertheless, as the problem of nicking is associated with longer snags, the advantage of early sprouting may become less valuable. Therefore, the first priority can be given to the more difficult part which is nicking and if that is acceptable, then cut back of the stock plant at the time of bud grafting can be practiced to make sprouting early.

When the snag is short,i.e. 15 cm, removing of the snag at the time of bud grafting gives poor sprouting. Also, removing the snag after either 2 weeks or 4 weeks have shown similar results in the time and the uniformity of sprouting.

A four month period is sufficient for the scion shoot to grow in to 2-3 leaf whorl stage provided that the recommended agromanagement practices are well adopted. Therefore, bud grafting can be carried out in late December, when the plants are about 4 months old and the stock plants cut in late January. Further, as the growth of the stock plant seems to influence on the growth of the scion, it is very

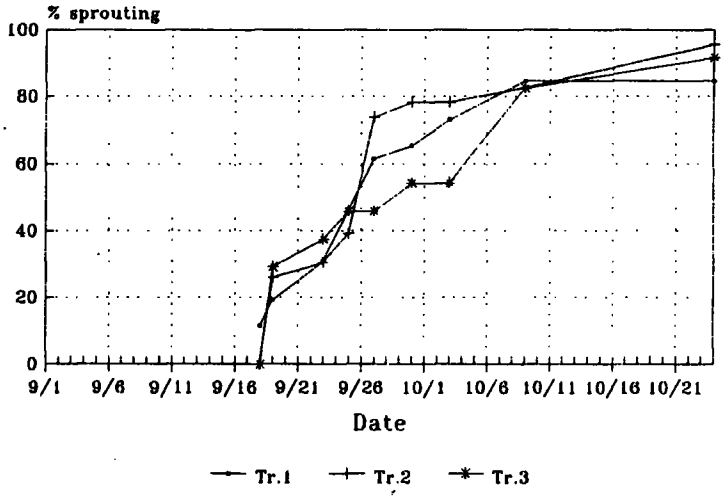

Fig.4. Percentage sprouting for three thiourea treatments in clone RRIC 100.

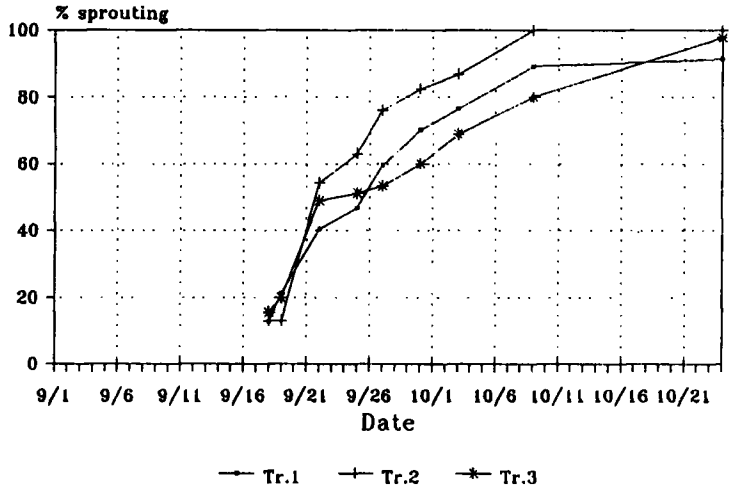

Fig.5. Percentage sprouting for three thiourea treatments in clone RRIC 130.

important to adopt all recommended practices such as selection of early germinated seedlings from the germination bed and fertilizer application etc. that will result in vigorous stock plants. Even though the recommendations are fully adopted, the growth of the scion shoots may show differences due to various reasons such as stock/scion interaction. Therefore, selecting of vigorous plants will improve the quality and the uniformity of the stand, though young buddings are normally more uniform than bare root budded stumps.

As far as the treatment of thiourea is concerned, though the effect seems to be positive, the exact effect of the chemical cannot be determined in this trial due to the lack of a control. However, both uniformity and higher percentage of sprouting are both equally important factors to the planter. The personal experience on use of thiourea is when sprayed once or twice on to the stem sprouting of dormant buds is promoted. When thiourea was applied, about 10-15 buds grow out at once where as only 3-4 buds emerge out normally. However, further trials are needed prior to recommending the application of the chemical and also the cost effectiveness should be looked into.

Studies carried out by many scientists have revealed that bud emergence is influenced by different factors possibly relating to the stock and scion compatibility. Samaranayake et al (1980) have studied the effect of the rootstock and the scion on bud emergence. It has been possible to group the clones, based on the pattern of bud emergence. In the present study, stocks are from mixed clones and the effect of thiourea was tested on two clones separately. The response of thiourea showed no differences between clones, but irrespective to the thiourea treatment, bud emergence was early and complete in clone RRIC 130. Under normal conditions, majority of buds emerge out after a reasonable time period, possibly with some relationship with the scion clone, but some buds remain dormant even for three months or more. A difference between 'leaf buds' and 'scale buds' on sprouting have been reported by Samaranayake and Gunaratne (1977). In the present study, the type of buds used was scale buds removed from green shoots.

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