SOME FURTHER DEVELOPMENTS IN THE VEGETATIVE PROPAGATION OF TEA

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SEVERAL techniques of rooting tea cuttings are in vogue. These techniques vary from Estate to Estate depending on the elevation, environmental factors, availability of planting material and other accessories for rooting.

Initial experiments on the method described below were conducted at the Nurseries of Queenstown Group and the preliminary trials have given very promising results. Further investigations to perfect this method is worthwhile. Despite the fact that this method involves an initial Capital Expenditure by way of cost on Polythene sheeting *etc.*, it is considered that the reduction of Nursery Labour on supervision and watering, the high percentage of rooting, early rooting and the production of uniform plants will eventually offset any increase in the cost of production. In the event of a sudden change in replanting policy bringing more acreage than originally planned this method could be put into use with great advantage to cope with the increased demand of planting material.

Branches suitable for taking cuttings were harvested from mother bushes which were in a physiologically active state *(i.e.* after useful showers of rain are received to make the axillary buds active). Internodal cuttings with buds developed to about half inch prepared from these branches were set two each in the usual potting mixture contained in polythene bags 8 inches tall into 4 inches diameter made from 150 gauge tubular polythene sleeves. Paring the apices of the leaves before setting for rooting may facilitate easy positioning of the cuttings to prevent overlapping and subsequent under exposure to light. The cuttings were then arranged in a bank on an East/West axis twenty to twenty-five feet long and 4 to 5 feet broad depending on the length and breadth of the polythene sheet to be

used. The cuttings were then given an initial hand watering and covered with a polythene sheet of 300 gauge taking care to see that the polythene sheet is drawn on all the four sides and kept firmly pressed to the ground by some weights to prevent it getting lifted by wind. It is absolutely imperative that the sheet is in close contact with the leaves. As the physical properties of polythene sheet is to permit diffusion of air and conservation of moisture, the water evaporated from the potting mixture and the water transpired from the leaves help to form a fine film of moisture between the plant leaves and the polythene sheet thus maintaining a humidity of 100 per cent. If the sheet is not allowed to touch the leaves, hot house conditions are created inside and with rapid rise of temperature the cuttings invariably tend to get scorched. A diffused and uniform sunlight of about 25 per cent intensity was allowed to play on the polythene sheet. This is accomplished by erecting a small structure twenty to twenty-five feet long, four feet broad and two and a half feet high and covering this with jute hessian the ends of which were allowed to hang freely up to the ground level. As a prophylactic it is desirable to spray the jute hessian with 3.3.40 Bordeaux mixture to prevent any mould developing and subsequent perishing. After 45 days duration the polythene sheet was carefully removed, during which period almost all the cuttings had rooted, from the 46th day onwards the cuttings were watered once a day in the evenings. It is also advantageous to spray water on the jute hessan at midday to maintain the humidity. The cuttings were kept under jute hessain for a period of six weeks after which they were gradually hardened by opening the jute hessain and subjecting the plants to direct morning sunlight for a duration of fifteen minutes on the first day and extending this period by fifteen minutes every day for a further period of one month after which the hessian was completely removed.

During continuous wet weather, water tends to accumulate on the top of the polythene sheet forming a miniature pool. This water is best removed by gently sweeping with the hand. Under no circumstances should the polythene sheet be lifted up to remove stagnating

water, as this will disturb the favourable conditions created inside. The polythene sheet could be reused a number of times after washing it free of mud and other sediments.

The rooted cuttings have a tendency to show nitrogen deficiency due to high photosynthetic activity; this is corrected by an application of a pinch of Sulphate of Ammonia to the soil once a month from the third month onwards. A complete nutrient solution foliar spray was used once a month consisting of:

48 Grammes	Ammonium Sulphate	)
48 "	Zinc Sulphate	)
4.8 "	Ammonium Molybdate	)
4.8 "	Iron Sulphate	) In 1 Gl. Water
4.8 "	Borax	)
4.8 "	Magnesium Chloride	)
1 Pinch	Copper Fungicide	)

This was found to be very beneficial, taking care to spray in the evenings.

TABLE No. 1 - Showing Percentage of Rooting

Trial No.	*No. of Polythene sleeves set with cuttings*	*No. of Cuttings rooted*	*Percentage rooted*
1	1,000	910	91.0%
2	1,000	740	74.0%
3	1,000	994	99.4%

TABLE No. 2 - Shows comparative Root and Shoot development between Polythene method and Fern method of propagations—two months after setting in Polythene Sleeves. Observations based on twenty plants selected at random from each method

Plant No.	Length of Shoot in cms		Weight of Shoot in Gms		Weight of root in Gms	
	Polythene Sheet Method	Fern Method	Polythene Sheet Method	Fern Method	Polythene Sheet Method	Fern Method
1	4.0	1.5	.45	.07	.22	.35
2	11.0	4.0	.85	.36	1.80	.08
3	No shoot	1.5	No shoot	.13	.35	.17
4	6.0	8.5	1.00	.86	.65	.12
5	12.0	6.0	1.45	.35	.55	.32
6	7.0	5.0	.55	.43	.20	.23
7	4.0	6.0	.27	.23	.27	.50
8	17.0	4.0	1.65	.25	.66	.37
9	10.0	3.0	1.26	.63	.55	.09
10	12.0	5.0	1.16	.31	.80	.46
11	11.0	2.5	.62	.23	.53	.31
12	13.0	4.0	1.47	.35	.59	.21
13	7.0	2.0	.57	.27	.16	.07
14	15.0	1.5	1.20	.11	.43	.14
15	9.0	9.0	.80	.60	.17	.27
16	8.0	3.0	.94	.21	.15	.31
17	15.0	2.5	1.86	.25	.52	.21
18	17.0	No shoot	2.15	No shoot	.52	.13
19	13.0	No shoot	1.55	No shoot	.34	.11
20	13.0	No shoot	1.05	No shoot	.47	1.00
Total	204.0	69.0	20.85	5.64	9.93	5.45
Average	10.2	3.45	1.04	.28	.49	.27

SUMMARY

1. Polythene sheet method of propagation was extensively used for rooting of Cocoa cuttings. On these results it was tried out for rooting tea cuttings and the preliminary trials gave very promising results.
2. As mentioned earlier this method should prove an ideal one for mid season rooting to cope with the increased demand of planting materials due to a sudden change in the Replanting Programme.
3. The low percentage of rooting obtained in the second trial was due to the polythene sheet being lifted up periodically to remove stagnating water.
4. The shoots developed from the axillary buds during the process of rooting were bent due to the weight of the polythene sheet. But once the sheet was removed the shoots gradually straightened up.