

COFFEE & CACAO TRAINING MATERIALS



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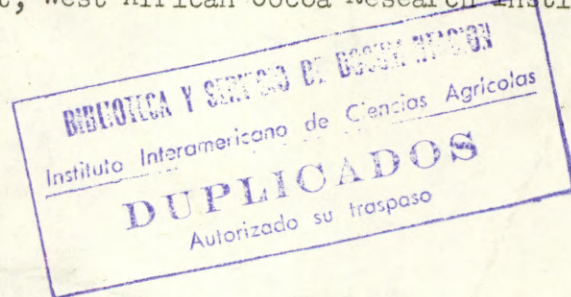
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ROOTING COCOA CUTTINGS UNDER POLYETHYLENE

by

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(Paper submitted in the 10th Cocoa Conference held in London in October of 1957)

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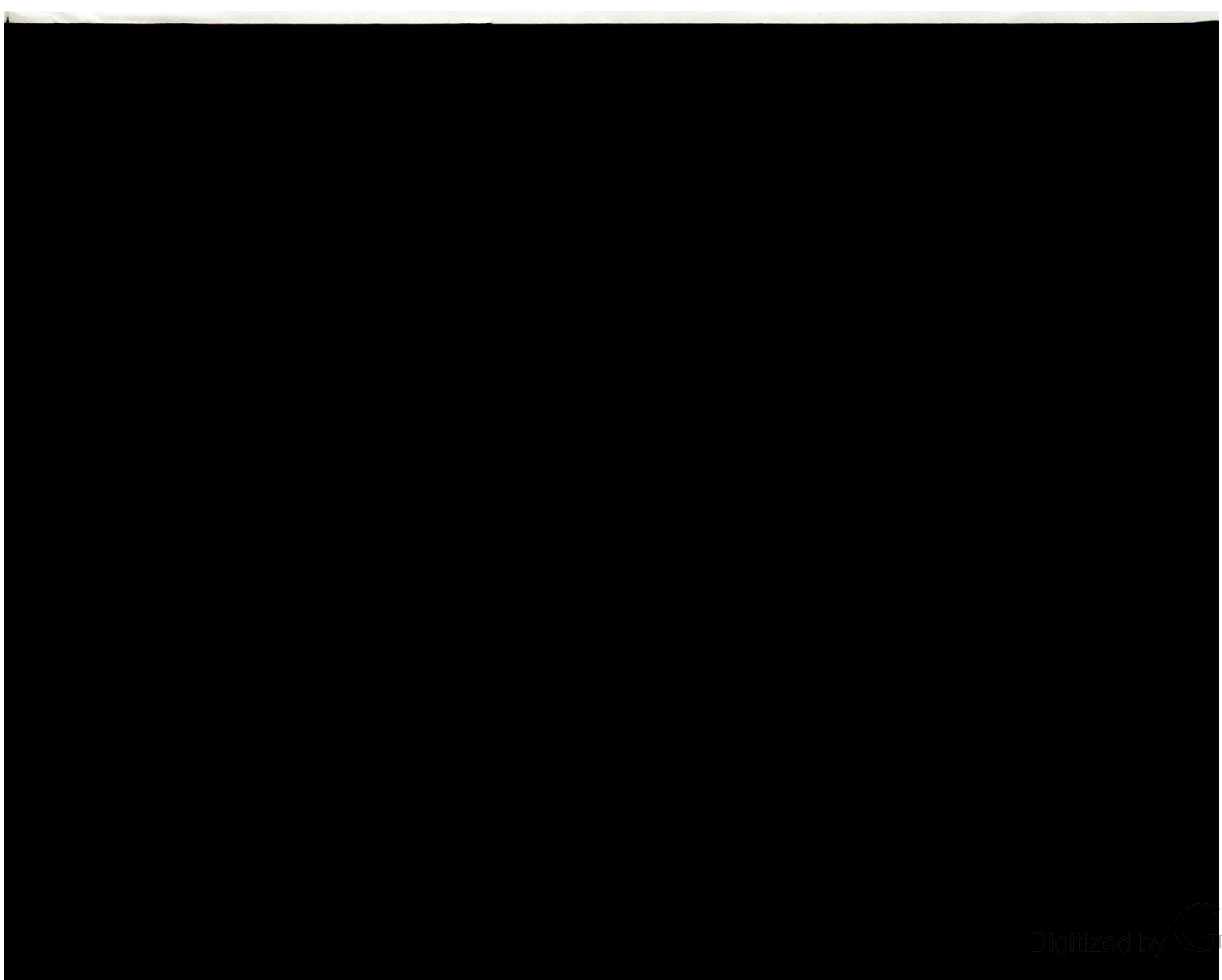
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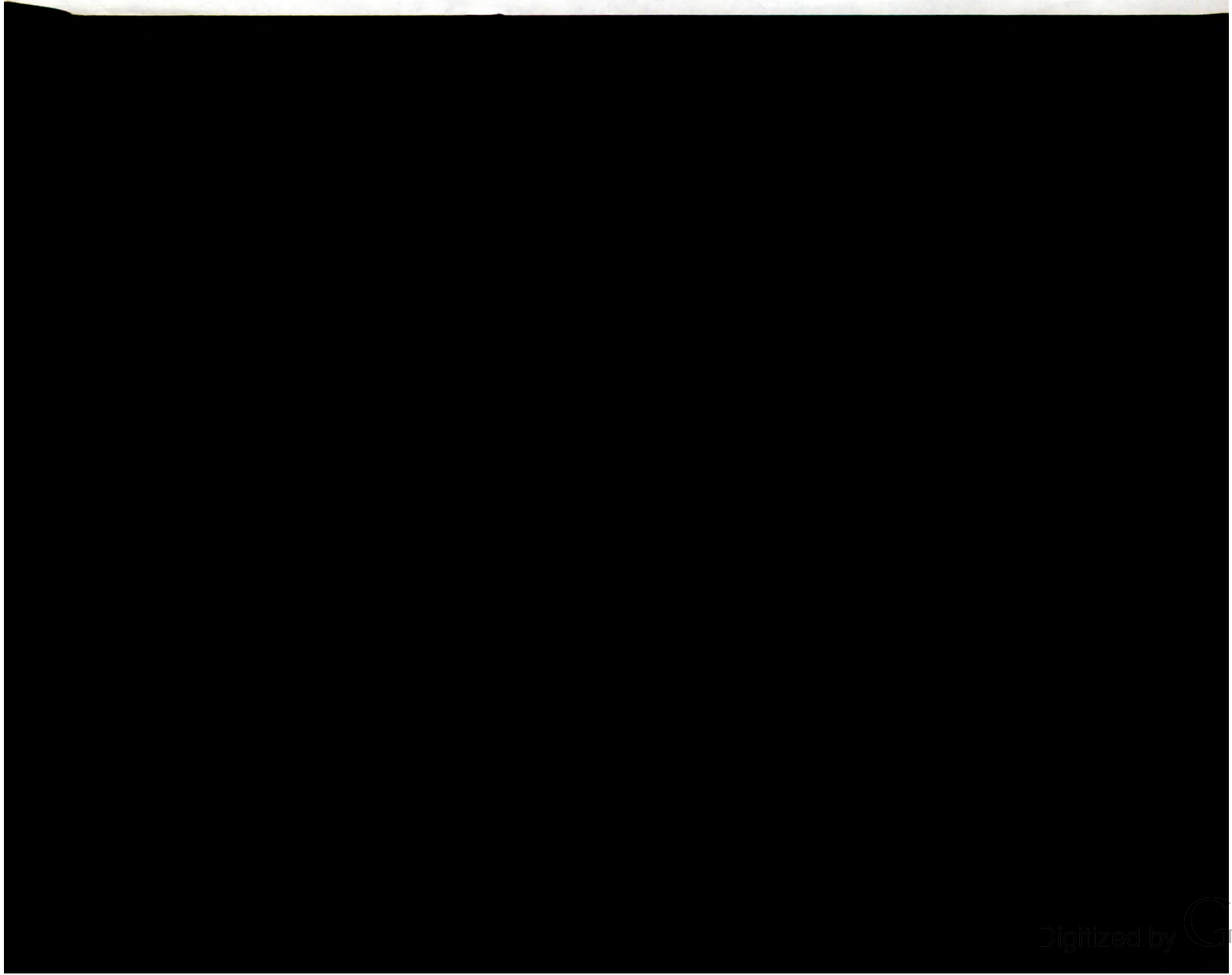
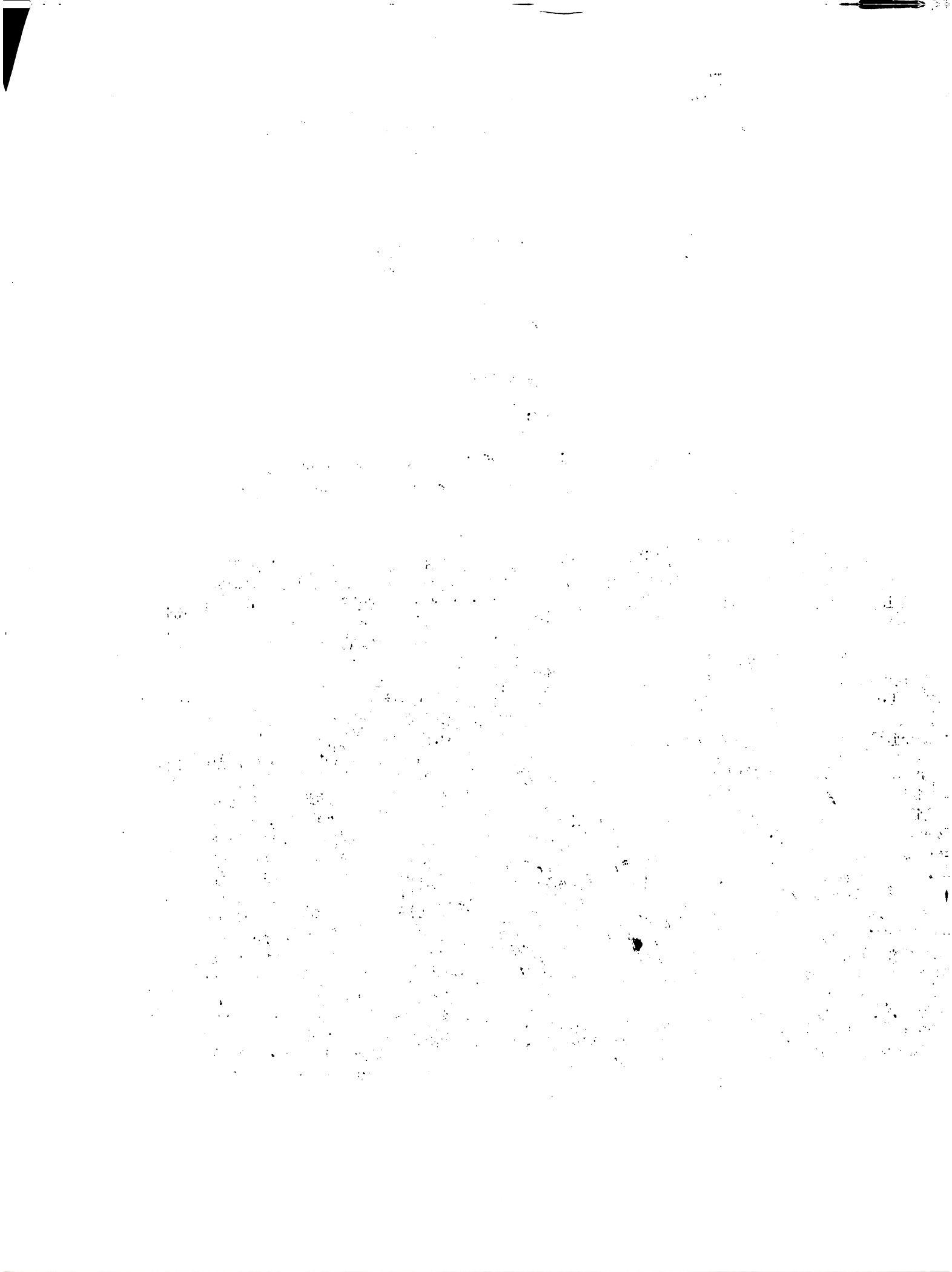
At the 1955 Cocoa Conference, a new technique of rooting cocoa cuttings under polythene was mentioned briefly. Since then the method has been modified and developed and is now in routine use at W.A.C.R.I. A full account of the experimental work carried out in developing the method is in the press (McKelvie, 1957) and this paper will give only a brief account of present practice.

Two-leaf semi-hardwood cuttings with about one inch of stem are taken from fan branches brought in from the field early in the morning. The leaves are normally trimmed to about two thirds of their original length and the stem is given a quick dip in a growth-promoting substance (0.5 per cent. B-indole butyric acid in 50 per cent. alcohol). A basket, 6 in. in diameter and 7 in. high made from palm midribs, is filled with potting soil around a central core of rooting medium (50:50 sand and composted palm fibre) and the cuttings inserted in the core. Fifty to 100 baskets are placed together on the ground, and after a liberal watering they are covered tightly with a sheet of polythene weighted down at the edges. Light intensity over the cuttings is reduced to about 15 per cent. daylight with slatted bamboo. The polythene as used at present is 3/1000 in. thick but we are experimenting with thicker material. The sheet is removed early in the morning every third day and the cuttings lightly watered. It has been found that about one pint of water every three days is adequate for 50 cuttings: more leads to water-logging and poor rooting. After four weeks the cuttings have rooted and hardening can begin. It should not be delayed or roots grow too far out of the baskets and are liable to die back during hardening. This is done by stages: during the first week the cuttings are uncovered from 6:30 a.m. to 10 a.m. and during the second and third weeks until 11 a.m. and 12 noon respectively. The hardened cuttings are then stored under shade until required for planting in the field.

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Apart from its ease the new method is more effective than the use of concrete bins. With the latter, for example, about 75 per cent. of clone R 15 cuttings root successfully, while nearly 100 per cent. take root under polythene. Even with a poor-rooting selection such as T17, over 70 per cent. successful rooting can be obtained, compared with only 30 per cent. in bins. Buds sprout more rapidly under polythene than in bins, and this early advantage persists until the plants are ready to go into the field.

No detailed costing has been done but it is estimated that a cutting produced in concrete bins costs two shillings and sixpence compared with about ninepence under polythene. There are considerable savings in both materials and labour. The construction of expensive bins is avoided, very little rooting medium (which is laborious to prepare and difficult to obtain in large amounts) is required and repotting after rooting is unnecessary. Furthermore, less watering is required than with conventional methods, which may be an important advantage where water supply is difficult. The polythene sheet is relatively cheap and can be used for about 18 months continuously.

This method of propagation is used in preference to techniques such as budding for a number of reasons. In contrast to the extreme simplicity of the polythene sheet method, budding calls for considerable manual skill, and it would, in any case, be unwise to apply the method on a large scale until we know more about stock-scion relationships in cocoa. Compared with cuttings in concrete bins or open spray-beds, cuttings under polythene show a remarkable tolerance. Successful results can be achieved with light intensities between 12 and 25 per cent. daylight, and provided the soil is not water-logged the amount of water which must be added is not critical.

The polythene sheet method of rooting cocoa cuttings can be recommended for either large or small-scale propagation. At W.A.C.R.I. this method is used to root large numbers of cuttings for the production of "clonal" seed by the Departments of Agriculture of Ghana and Nigeria, but it is equally suited to use by the peasant cocoa farmer.

Reference:

McKelvie, A.D. (1957) The Polythene Sheet Method of Rooting Cacao Cuttings. Trop. Agriculture Trin. (in press).

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