

Rubber Planting Techniques.—Part I.

The Handling of Rubber Seed.

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Introduction.

Increasing use is made by planters in the Territory of Papua and New Guinea of clonal rubber seed. This seed is at present mainly imported from Malaya and owing to its high cost it is essential that nursery techniques should be such as to ensure maximum germination. Complaints are received from time to time about the poor germination of rubber seed and these notes are intended to assist planters to obtain good results from their seed, whether imported or of local origin.

Treatment on Arrival.

Seeds should be planted immediately upon arrival at the plantation. Rubber seed deteriorates rapidly unless special facilities, such as refrigerated storage, are used. Normally the seed keeps its viability well for only about ten days. Loss of moisture content of the seed is probably the main cause for the loss of viability. If for any reason the seed cannot be planted immediately, it is advisable to unpack it and place it in damp charcoal or between moistened layers of hessian. It should be kept out of the direct sunlight under all circumstances.

Seeds arriving in sawdust should be washed free of all sawdust prior to planting, since ants may be attracted to the sawdust and disturb the soil around the seeds.

Germination Beds.

Pre-germination is particularly advisable prior to planting in order to reduce waste and to secure a uniform establishment in the nurseries. This is particularly important where costly imported seed is used.

Germination beds must be prepared before the arrival of the seed in order to avoid delay in planting with consequent loss of viability.

It is important to make the germination beds of loose friable material which does not compact with frequent watering. It must have plenty of air space and good water-retaining properties. Aeration is more important than nutrition since seeds depend mainly on their own food reserves at this stage. A heavy compacted soil, such as clay, will often cause water logging, which is considered to be the main cause of failure in germination.

The best germination medium is river sand with not too high a fine sand fraction. A light loamy soil is also quite suitable if well cultivated, i.e., broken down to a fine tilth to a depth of at least four inches. Heavier soils could be worked into the required structure by mixing with coarse river sand. If only a limited quantity of sand is available, it is a good practice to spread the sand on top of the soil; a depth of two inches will be sufficient. Sawdust should not be used as a germination medium as its acidity could adversely affect the seed unless the sawdust is well weathered or boiled first.

Germination beds should be raised to four inches above the general soil surface, so that excess water may drain freely. They should be situated on a level site near a reliable water supply. To guard against the washing away of the soil, the raised ground should be kept in place by flattened bamboo, planks or other suitable material. So that all parts will be accessible, beds must not be over four feet in width. The length of the beds depends on the number of seeds to be

planted. On the average, one thousand seeds will cover one square yard of germination bed.

It is necessary to provide shade over the bed at a height of about five feet. Kunai grass (*Imperata cylindrica*), palm fronds or other broad leaved plants make suitable material for shading. Germination beds can also be established under rubber or other trees. Indirect sunlight should reach the beds but care must be taken to ensure that they are not exposed to strong direct sunlight for any length of time.

Planting the Seed.

Keep the seeds in a cool shady atmosphere during planting operations. Seeds are laid out on the surface of the germination bed with the grooved side downwards. They are set out very closely together and may be touching one another but not overlapping. The seeds are pressed by hand into the germination medium to a depth of about three quarters of their diameter. In a pure sand medium they may be pressed down further leaving the top just visible. At the Bisianumu Rubber Centre the seeds are not covered with sacking, as is sometimes done in Malaya, since it was found that this caused excessively damp conditions and could easily result in rotting of the seeds. But the beds are therefore lightly covered with kunai grass, leaving the seeds still more or less visible. This light covering of grass appears to ensure a more even temperature around the seeds during day and night which probably is of importance at this altitude (1,800 ft.) and seems to improve germination. The cover is taken off as soon as the seeds commence to germinate. Overhead shade remains as long as seeds are in the bed.

Watering is done several times daily and a knapsack sprayer has been found to be ideal for this purpose, since the light mist spray gives an even distribution of moisture and does not cause any disturbance or exposure of the seeds. Germination beds must be kept moist, but not wet; this is regarded as the critical requirement for successful germination. It is advisable to protect the seeds from rats, bandicoots, etc.,

by surrounding the beds with fine gauge chicken wire, which is dug into the ground to a depth of about one foot.

Germinated Seed.

Fresh rubber seed normally germinates within a week of sowing but germination after three weeks or more is not unusual in this Territory. On more than one occasion at Bisianumu seed has germinated four weeks after being placed in the germination beds, and most of them have grown into perfectly healthy seedlings.

On germinating, the emerging root breaks through the seed coat and appears as a white rootlet with a flattened end. This is the time for transplanting to the nursery and daily inspection and transplanting of germinated seed will ensure a uniform stand of seedlings. Seeds are carefully lifted from the bed and carried to the nursery; the delicate young seedlings must not be laid in deep layers when carried to the nursery or they may be damaged. Ungerminated seeds are reset in the bed, lightly covered, and watered. Chances of successful nursery establishment are enhanced by planting the germinated seed as early as possible, preferably before the young shoot starts to develop, although it is possible to transplant seed with a growing stem as long as it is done before the first pair of leaves unfold. Generally speaking, the earlier germinated seed is transplanted the better are the chances of success. At this early stage there are sufficient food reserves within the seed for the root to penetrate deeply and secure moisture; later these reserves are depleted and moisture is lost by transpiration through the stem. Delay in transplanting also increases the possibility of root and stem damage.

Hot and sunny days should as far as possible be avoided during transplanting operations, particularly when planting the more advanced material. It is obvious that shade over the nursery beds must be established prior to transplanting and on no account should germinated seed be exposed to direct sunlight.

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