A GUIDE TO
OIL PALM NURSERIES

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The Incorporated Society of Planters

Irrigation Systems For Nurseries
Sumisansui MK II
Sumishower 30F-17·

A Guide To Oil Palm Nurseries (Extract)
J.E. Duckett

PERFORATED LAYFLAT POLYTHENE TUBE-SPRAY-MIST SYSTEM

This system utilises a layflat polythene tube of which the upper surface has been laser perforated to give holes at 15 cm apart throughout its length. This tube comes in 100 m rolls, weighing 2.5 kg each and is thus very light and easy to transport (*Figure 13*).

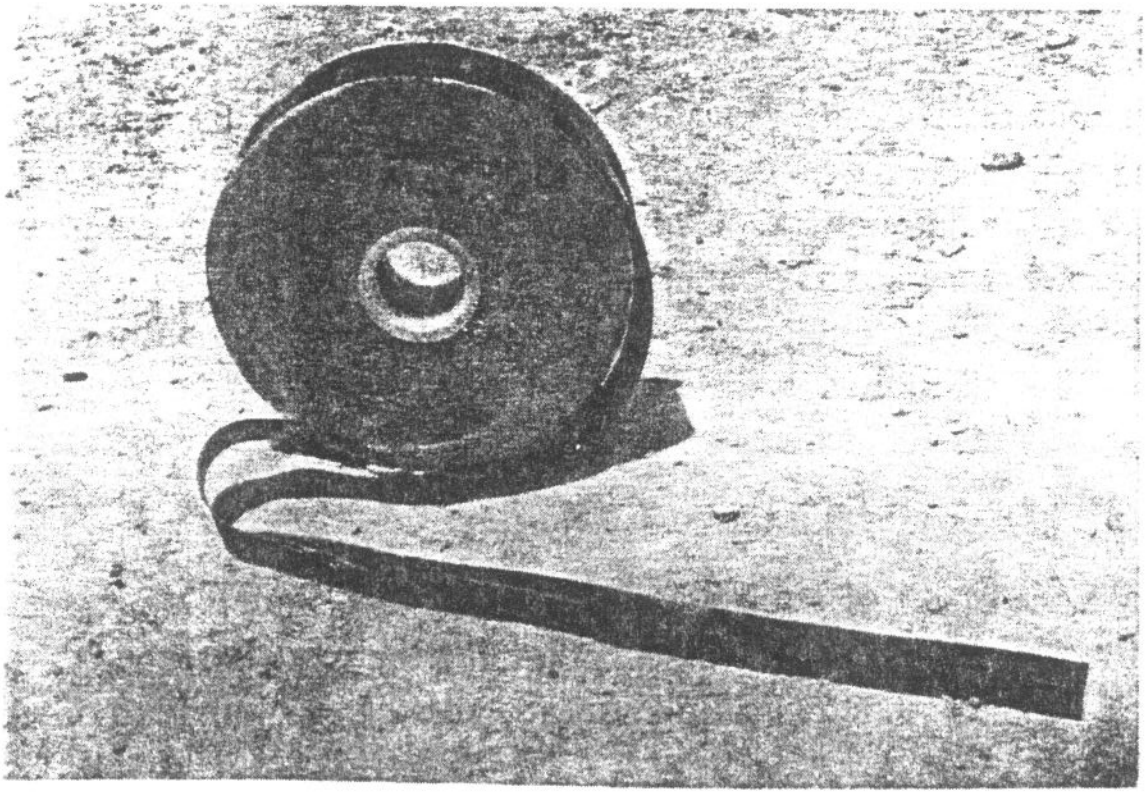

Figure 13 A roll of layflat perforated polythene tube

Several types and brands have been introduced in the market since the introduction of the Sumisansui tubes in 1985 (Ramli & Duckett, 1987a). One brand comes with four laser holes every 15 cm apart; but its performance was reduced if the same pipe sizes as for the two hole type was used as there was insufficient water to feed the 100 m roll.

Main nursery layout

In this section both imperial and metric measures are given as the items in Malaysia are still marketed under imperial measures.

The tube can satisfactorily irrigate five rows of bags when placed at 0.76 m triangular spacing. Thus the distance between the tubes is maintained at 3.05 m. This spacing allows for 19 900 polybags per hectare.

A 3 in. (7.6 cm) main supply line of class 'B' PVC is utilised and this is placed so as to bisect the nursery as far as is possible. If necessary the nursery can be divided into several sections, each centrally served by a 3 in. (7.6 cm) pipe which in turn can be served by a larger bore PVC Class 'D' 4 in. (10.2 cm) pipe direct from the pump to achieve the same objective.

The 3 in. (7.6 cm) PVC pipe, outlets are stepped down to 2 in. (5.1 cm) and then 1.5 in. (3.8 cm) and a 1.5 in. (3.8 cm) gate valve is fitted to control the main flow.

From this gate valve the flow is transferred to a 1.5 in. (3.8 cm) Class 'B' PVC pipe to which are connected 8 lengths of Sumisansui perforated tube *via* 1.5 in. (3.8 cm) x ¾ in. (1.9 cm) PVC T-joints (*Figure 14*).

Thus each 1.5 in. (3.8 cm) gate valve controls a 25 m length of 1.5 in. (3.8 cm) PVC pipe to which are connected at 3.05 m intervals 8 x 100 m lengths of Sumisansui tube *i.e.* each gate valve controls the irrigation of 2 440 sq m (*Figure 15*).

With this layout in a 25 ha nursery a 120 hp diesel engine mining pump with an 8 in. (20.3 cm) intake/6 in. (15.2 cm) outlet was used.

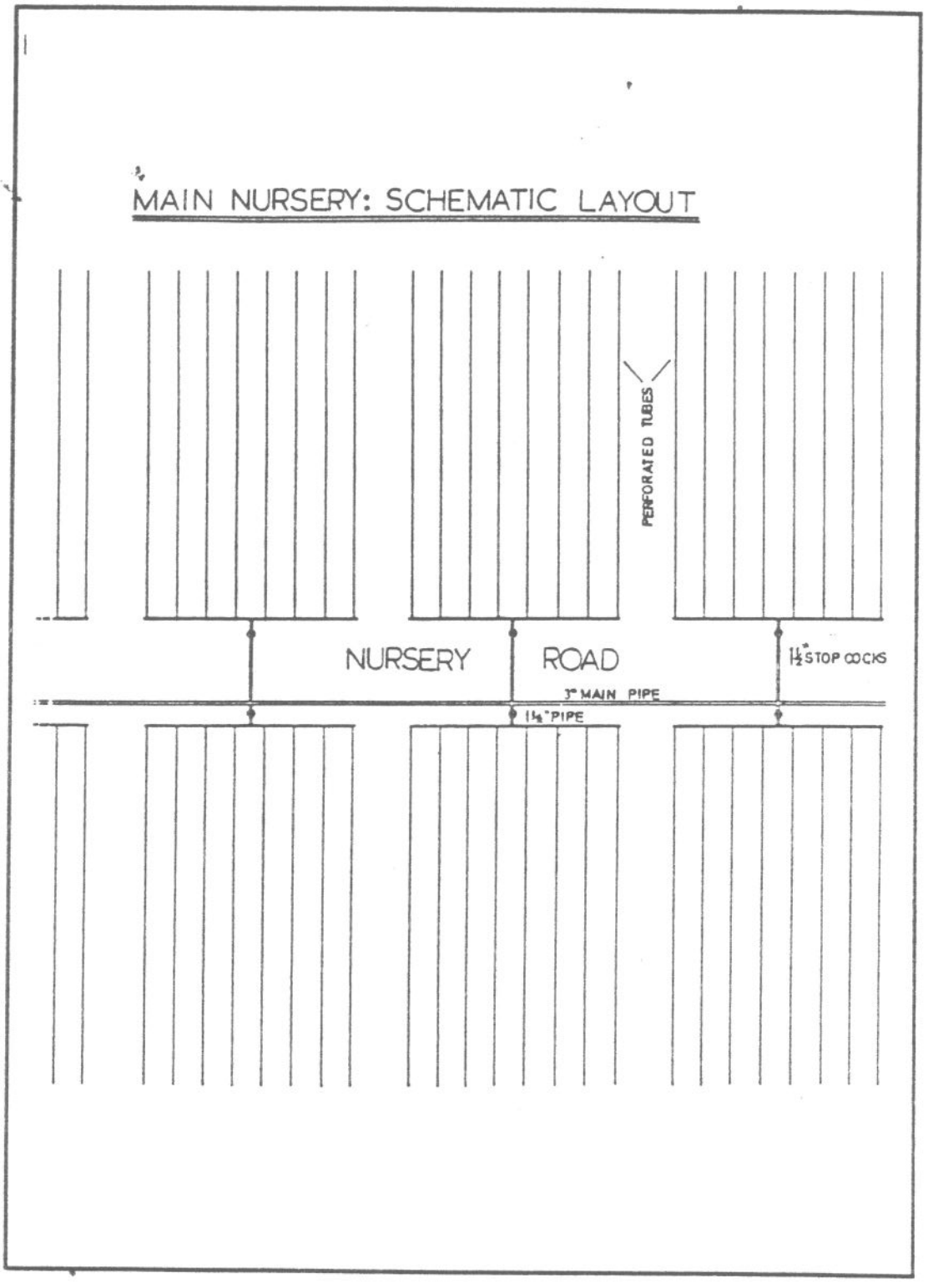

Figure 14 Main nursery: schematic layout for layflat perforated tube system

With this equipment with 20 of the 1½ in. (3.8 cm) gate valves fully open (*i.e.* using 160 x 100 m lengths of tube) optimum pressure over the area is achieved and an area of 5 ha is covered. Thus in a

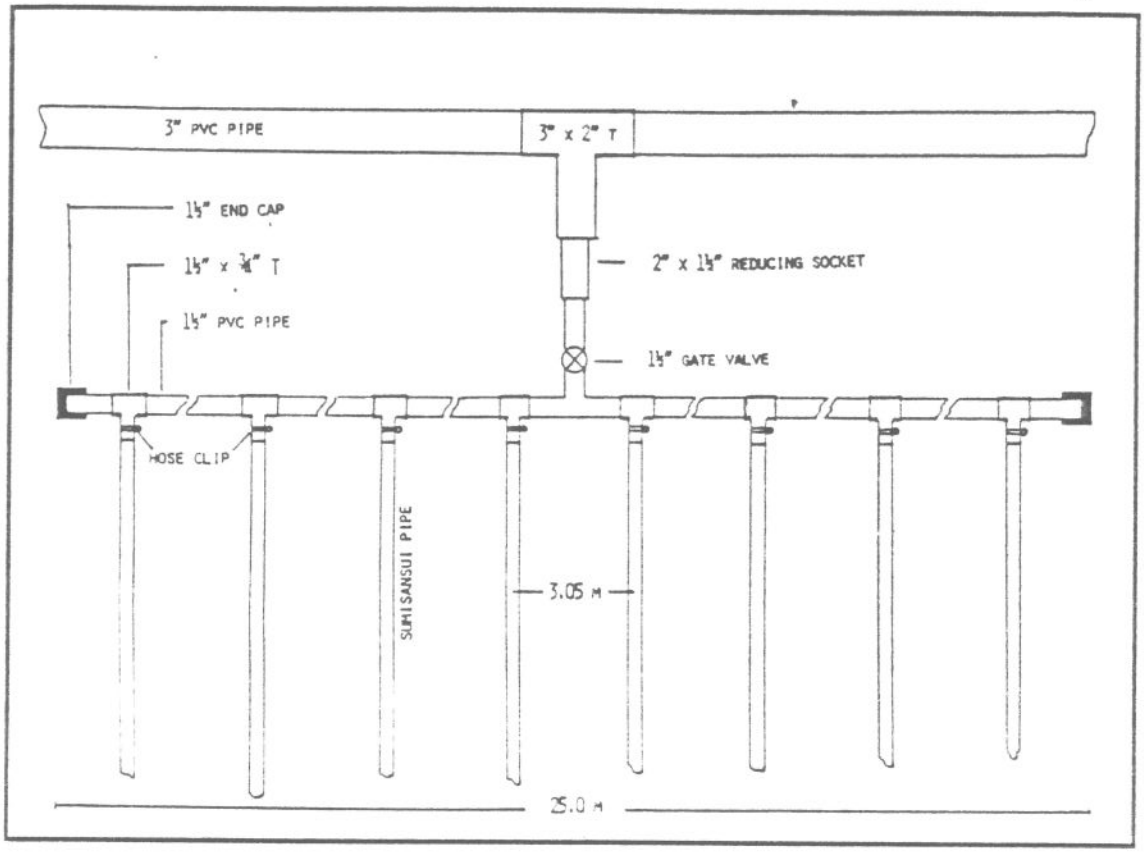

Figure 15 Main nursery : schematic pipe and tube connection system for lay-flat perforated tube system

25 ha nursery, only five separate irrigation sections are required.

The PVC main water carrier pipes should be covered by several inches of soil to protect them and prevent solar heating; but the actual pipelines should be pegged so that all are aware of their siting.

The section on **Piping for nurseries** (p. 148) should be referred to for piping requirement for connection of system to pumpset.

Obtaining best results from the perforated tube system

Some points which need close attention include:

i) The ground upon which the tube lies should be free of grass or weeds as this can block holes or divert the direction of the spray.

ii) The ground should be free of hard or sharp articles that could

lead to puncturing of the tubes if any weight is placed on them.

iii) The very effective spread of spray is achieved by the elliptical shape that the tube assumes once water pressure is built up. This ensures that the two lines of laser perforated holes are pointed one to the left and the other to the right of the tube. This is important for correct spread of the mist. It is, therefore, essential that the tube is laid on a level base along its length; otherwise an uneven spread of mist will result.

iv) In determining whether the pressure in the tubes is correct, the ideal would be to incorporate a meter for check read-offs. However, with Sumisansui tube as a very useful rule of thumb, it is noted that if water pressure is such that the height of spray does not exceed 2.13 m, there will be no undue pressure on the tube which could otherwise result in bursts. *Other makes may however have different criteria.*

v) Life of the Sumisansui tube in Japan has been proven to be at least five years and in Malaysia it has been fully exposed for three years and is still fully functional.

Comprehensive details are given in the original paper (Ramli & Duckett, 1987a) which should be referred to if such a system is being considered.

Usage modification

Over the years since it was introduced in the plantation industry, users have made adjustment to overcome the shortcomings that have been encountered (such as uneven distribution of spray mist when the seedlings are overgrown). One such innovative adjustment is to place the tubes on raised wooden platforms. Besides providing an even distribution of water, this adjustment reduces damage to the tubes by being trampled, and reduces the frequency to remove weeds/ debris on the tubes if they are laid on the ground (*Figure 16*).

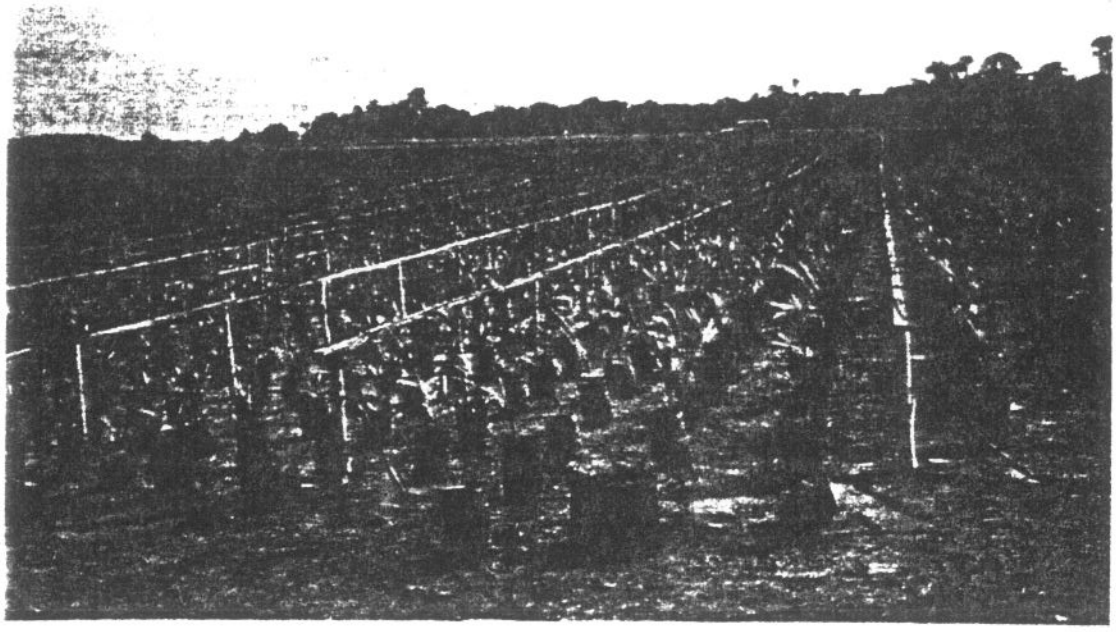

Figure 16 Tubes on raised wooden platform

Useful comments

The mist spray produced is beneficial agronomically and leads to the following:

- Palms are ready for the field planting at nine months from seed and are very vigorous.
- Fertiliser uptake is superior to that in the earlier mentioned systems and is not displaced from bags; and mixtures appear as effective as compounds with this watering system.
- Hardcapping is not a problem (see section on **Soil surface algae and "hardcap of soil"** in p. 98).
- A much easier method of dealing with doubletons can be practised (see **Approaches to treatment of doubletons** - p. 69)
- As the tubes can be easily rolled up, cultivation of the nursery between seasons is simplified.
- The lightweight of the tubes is ideal for isolated situations. Enough tube for a 25 ha nursery would fit onto one average lorry.