

PLANTING MEDIUM FROM OIL PALM BIOMASS: ROCKWOOL SUBSTITUTE

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INTRODUCTION

The oil palm industry in Malaysia generates more than 1.3 million tonnes of oil palm trunks (OPT), 8.0 million tonnes of pruned and felled fronds (OPF), and 2.4 million tonnes of empty fruit bunches (EFB). These massive quantities of OPT, OPF and EFB are the biomass components available from replanting, and also through routine field and mill operations. It is estimated that 76,000 hectares of matured palms will undergo replanting every year.

The present use of oil palm biomass is still in the agriculture sector. The EFB is incinerated and the resulting ash is returned to the field as fertilizer. Some of the whole EFB, together with OPT and OPF are also being used directly as sources of organic fertilizer on decomposition. However, some higher value commercial outlets need to be made available to address the accumulation of these biomass within the industry.

PORIM's R & D activities have proven that OPT, OPF and EFB can be converted into pulp and paper, mattresses and reconstituted boards. In addition to these high value products, oil palm biomass could also be utilized as a planting medium, an alternative to rockwool. Initial observations on planting medium from oil palm biomass that have been planted with tomatoes and brinjal showed that these plants were able to sustain their growth. Hence, PORIM and Lembaga Pertubuhan Peladang have initiated a joint research study to ascertain the suitability of oil palm biomass as a planting medium on a commercial scale.

MATERIALS AND METHODS

The oil palm biomass, regardless of its form and

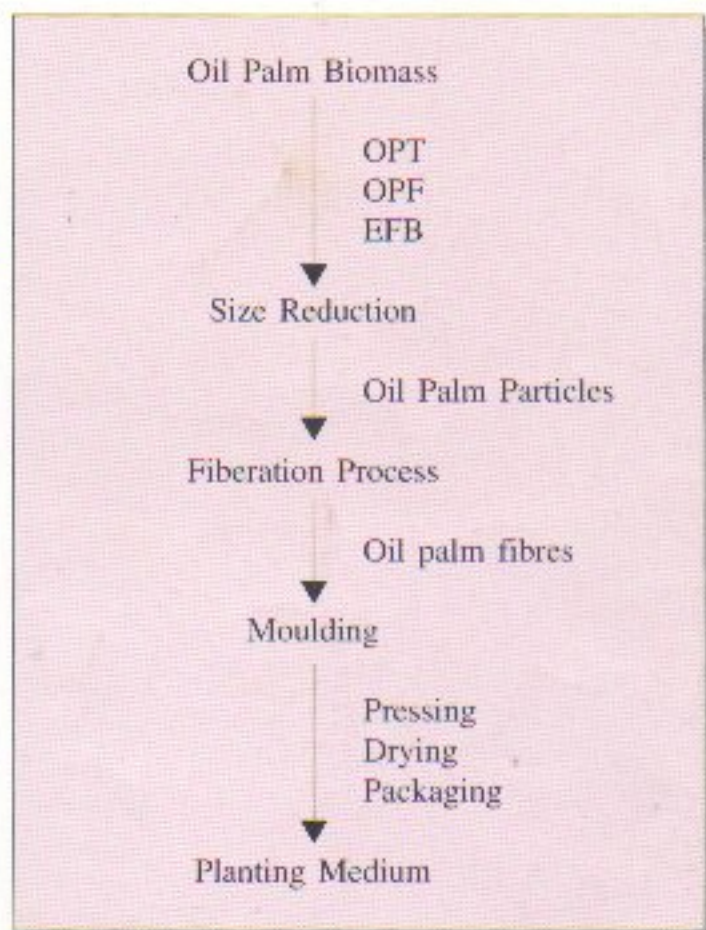


Figure 1. Process Flow of Oil Palm Biomass into Blocks of Planting Medium

size, is reduced into particles of a suitable geometric shape through a reduction mill. Figure 1 illustrates the process flow of oil palm biomass into blocks of planting medium.

The ground particles are fiberated in a refiner under an open discharge. The defiberated fibres of a known fibre consistency are placed into a moulding machine. After draining the water, the retained fibres are compressed into blocks of 50.0 cm x 15.5 cm x 7.0 cm in size. Blocks of planting medium





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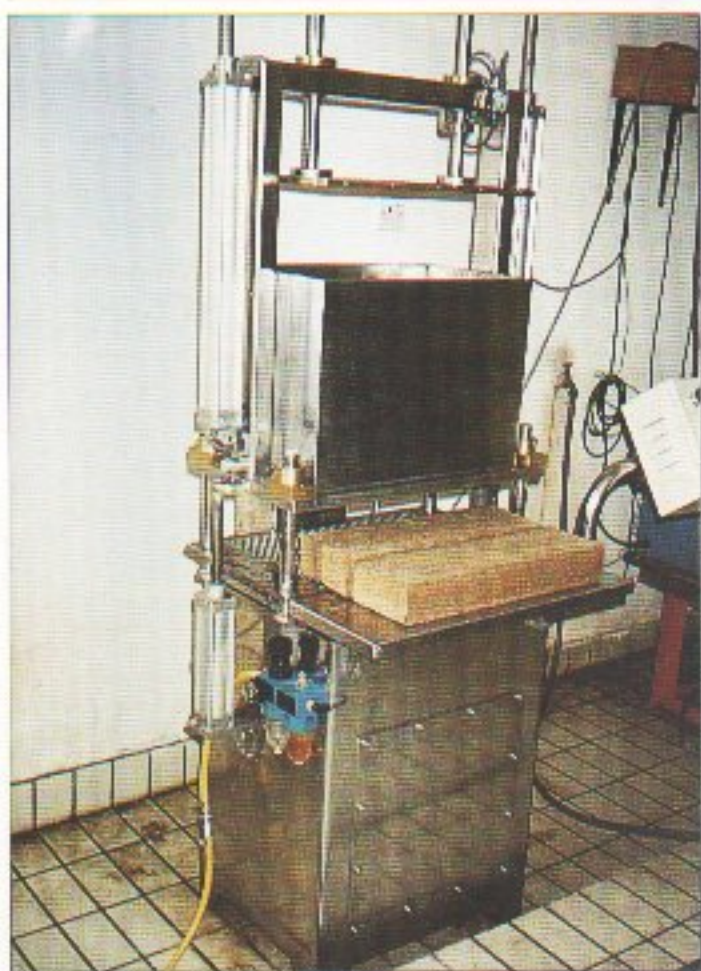


Figure 2. Prototype Moulding Machine for Planting Medium from Oil Palm Biomass

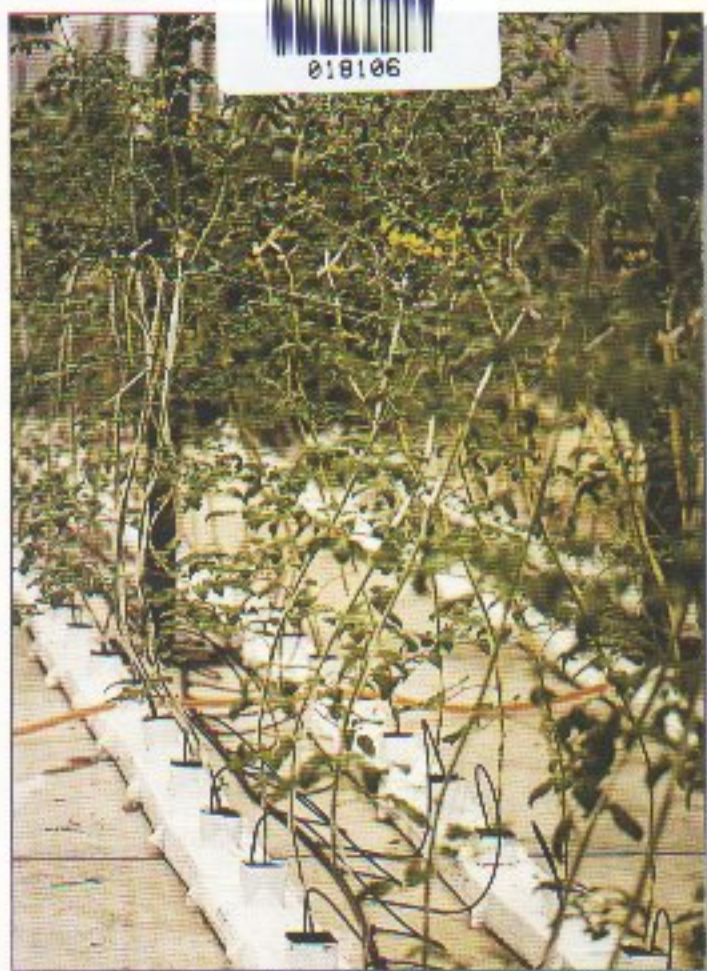


Figure 3. Tomato Plants Growing on Oil Palm Planting Medium

have been successfully produced by this prototype moulding machine (Figure 2). The resulting blocks of planting medium are dried to about 70% dry content and finally sealed in polyurethane bags.

CULTIVATION OF VEGETABLE CROPS

The dried planting medium is wetted with a fertilizer solution for seven days prior to transplanting of the crops. This wetting process is to build the planting medium fertility to a recommended level. These blocks of planting medium have been planted with tomato plants using fertigation technique (Figure 3).

ADVANTAGES OF USING PLANTING MEDIUM OIL PALM BIOMASS

1. **Biodegradable.** The planting medium will start to decompose with time upon usage. The decomposed planting medium could be marketed as soil-natural fibre-fertilizer compost admixture

as soil-natural fibre-fertilizer compost admixture as an outlet for disposal.

2. **Good water-fertilizer retention.** The planting medium retains water as much as six times its dry weight. Hence, the fertigation of a fertilizer solution could be reduced from three to two times per day.
3. **Readily available and renewable resources.** Oil palm biomass is a renewable resource and readily available in million of tonnes every year.

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