

The decline in the rate of palm oil extraction is due to a great extent to the incomplete collection of loose oil palm fruits. This has worsened with labour shortages, which have been repeatedly mentioned as the most critical factor in ensuring all bunches and loose fruits are harvested and collected. Labour shortage continues to pose the greatest challenge for the oil palm industry. Such shortages will lead to poor harvesting practices resulting in longer harvesting intervals and higher quantities of loose fruits left uncollected. Uncollected loose fruits account for about 3% – 5% of bunch weight. Consequently, prolonged failure to collect and process these loose fruits will contribute to further reductions in the oil extraction rate and profits.

Loose fruits are currently collected by way of raking and/or picked by hand (*Figure 1*). These techniques are not only labour-intensive and time-consuming but also tedious and laborious. Besides, the debris content when raking is practised can be as high as 60% by weight.

A study was thus carried out on the approaches of collecting and separating loose fruits and to design a cost-effective device for loose fruits collection.



Figure 1. Conventional method of collecting loose fruits in an oil palm estate by hand.

INVENTION OF A ROLLER LOOSE FRUIT PICKER

The Roller Loose Fruit Picker, or in short the Roller Picker (RP), collects loose oil palm fruits by picking and retaining the loose fruits in a case without tedious and laborious efforts. It is designed to be manually operated, and is practical and affordable.

The functions of the RP are:

- to collect and pick up loose fruits from the ground; and
- to separate the loose fruits from debris.

The invention is an oval-shaped case made of a plurality of wires or rods. The novelty is that, during operation, the RP is rolled with a little pressure against the ground causing the wires or rods of the case to split open and to trap the loose fruit inside the case (*Figure 2*). Once the loose fruits are entrapped inside, the wires or rods of the case will return to their normal position. All debris smaller than the spaces between the wires or rods will drop from the case, and therefore will result in only debris-free loose fruits being collected.

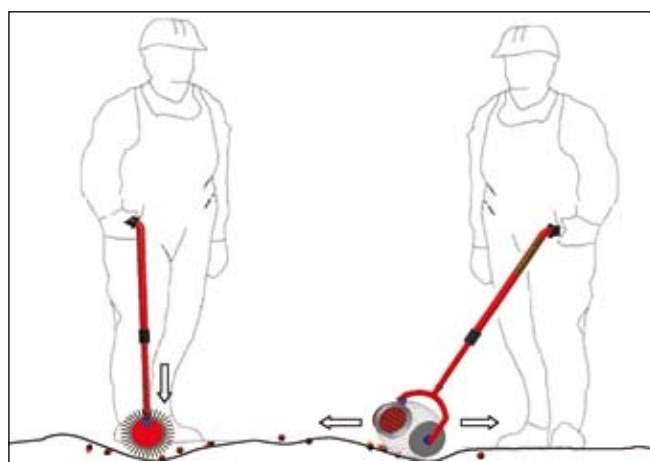


Figure 2. Roller Loose Fruit Picker (Roller Picker).

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PRODUCT SPECIFICATIONS

Figure 3 shows the RP and its specifications.



Overall Dimensions

Roller device	
Width (W)	280 mm
Diameter (Ø)	120 mm
Handle	
Length (L)	1 000 mm

Figure 3. Technical specifications of a Roller Picker (RP).

FIELD OPERATION

The Roller Picker (RP) is designed to suit all types of field conditions around the bases of the palms (Figure 4). The basic operation is to pick up all fruits on the ground with a simple mechanism which is similar to hand picking (Figure 5). The RP is easy to operate, faster and less strenuous to the collector.

Field trials were carried out at the MPOB/UKM plantation. The trials showed that the RP was capable of collecting, on average, 30 to 60 kg hr⁻¹ of fruit, depending on the ground conditions. The collected fruits were not damaged and were free from debris.



Figure 4. Operating the Roller Picker around the palm base.



Figure 5. Collecting loose oil palm fruits at the base of the palm using the Roller Picker.

BENEFITS

The benefits in using the Roller Picker are:

- the task is less strenuous and reduces back pain of the loose fruit collector;
- it results in debris-free collected loose fruits; and
- increased palm oil quality is achieved at the mill.

ECONOMIC FEASIBILITY

The capital investment of the RP is considered attractive with a payback period of one year. The investment is economically feasible as it is expected to yield a benefit-cost ratio (B:C) of 2.14, a net present value (NPV) of RM 892.35 and an internal rate of returns (IRR) of 46%.

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