

# QUALITY TESTING LABORATORY FOR THE OIL PALM MOTORISED CUTTER

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**M**alaysian Palm Oil Board (MPOB) has developed a hand-held motorised harvesting tool called *Cantas*, for fresh fruit bunches (FFB) harvesting (Figure 1). The invention was aimed at increasing harvesting productivity and reduces workers. The hand-held motorised cutter is equipped with a chisel or sickle as the cutting tool attached to a telescopic pole. It is powered by a small engine to activate the chisel or sickle to perform the cutting. The technology was transferred to the industry and commercialised.

Results from plantations revealed that an operator with the motorised cutter, *Cantas* is able to harvest 6 – 10 t FFB per day. In the harvesting activity with *Cantas*, a team of three workers is formed where one worker operates *Cantas*, while the other two workers collect FFB, loose fruits and frond stacking. This enables increase in the daily productivity by 2 – 3.3 t per worker, depending on the crop level in the estate.

## SERVICE OFFERED

MPOB has licensed several local and foreign companies to manufacture and market the hand-held motorised harvesting tool.

It is crucial that the machine complies with the industry standard in terms of performance, durability and safety. In fulfilling this, MPOB has established a Quality Testing Laboratory to carry out vigorous quality and safety tests. These include materials hardness, engine endurance, fatigue, functional, vibration, noise and impact tests. Upon successful completion of the tests,



Figure 1. Oil palm motorised cutter (*Cantas*).

manufacturers are awarded the *Certificate of Quality*.

The Laboratory is equipped with standard equipment for quality testing. Details of the tests are shown in *Table 1*.

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**TABLE 1. SERVICES OFFERED BY QUALITY TESTING LABORATORY MPOB**

No.	Type of test	Test description	Minimum standard
1	Physical properties	Measures the weight, length, deflection and centre of gravity (COFG) of the machine	No minimum standard. Reports the physical properties only
2	Hardness test of parts (Figure 2)	Hardness is a parameter that reflects the strength of components. Cutting head components will be dismantled for the hardness test	Hardness range: 35 – 60 Rockwell Hardness (HRC)
3	Functional test	The machine is tested to ensure that it can effectively cut frond and FFB	Effectively cut 10 fronds and 10 FFB
4	Impact test (Figure 6)	The machine is dropped from two different heights (1 m and 2 m) at three angles (30°, 45° and 60°)	No damage or dent to the engine, pole and cutting head
5	Vibration test (Figure 3)	Vibration generated by the machine is measured at two points <i>i.e.</i> at the engine's throttle and at the hand gripping point on the pole	A daily exposure action value (EAV) of below 2.5 m s <sup>-2</sup> A(8)  <u>Standard:</u> Control of Vibration at Work Regulations 2005 (the Vibration Regulations) ISO 5395-1
6	Fatigue test (Figure 4)	The machine will be run for 100 hr on a simulator jig which mimics to actual operation in the field.	No damage to cutting head, shafts and bearings
7	Performance and endurance test (Figure 5)	Assessment on torque and power for 100 hr  Temperature, fuel consumption and consistency of RPM will be monitored	Engine performance curve (torque and power <i>vs.</i> engine RPM)  No damage to piston, connecting rod, piston ring, and no severe scratch to the piston bore  Standard: ISO 1585

## INSTRUMENTS



Figure 2. Material hardness tester.



Figure 3. Vibration test during cutting (left) and Dewesoft vibration equipment (right).



Figure 4. Fatigue test simulator (left) and fatigue test jig (right).



Figure 5. Engine dyno for engine's performance and endurance test (left) and control room (right).



Figure 6. Impact test.

### **SERVICE COST**

A fee of RM 3000 per sample (subject to change).

### **CONCLUSION**

Service offered by the Quality Testing Laboratory benefits manufacturers of oil palm motorised cutter manufacturers by ensuring the products meet the industry standards for performance, durability and safety.

For more information, kindly contact:

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