

# A SIX-WHEEL-DRIVE TRANSPORTER FOR OIL PALM FFB EVACUATION

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**A** single chassis transporter with off-road capability is an alternative solution to the plantation and surpasses the conventional four-wheel-drive tractor in performance. The transporter can be equipped with different agricultural implements to improve traction while working under demanding field conditions, *e.g.* soggy areas or steep terrain.

## PRODUCT DESCRIPTION

The six-wheel-drive transporter (6WD transporter) has a single chassis configuration resting on three axles and equipped with six equal sized tyres. Apart from the standard front wheel steering, the 6WD transporter is equipped with an additional steerable rear axle. This rear axle steering can be engaged and disengaged depending on need. If four wheel steering mode is engaged, its turning radius would be reduced to half, making turning in a tight spot a lot easier. Another novelty of the 6WD transporter is its rocking arm, when both middle and rear axles are bolted. The arm is hinged to the chassis, which allows it to swing up and down in relation to the chassis so that all four rear wheels are always in contact with the ground. With this feature, the 6WD transporter has better traction on uneven ground. The 6WD transporter is also equipped with a Grabber for picking. The 6 WD transporter has a 45.3 hp KUBOTA V2203-E 4-cylinder diesel engine, a 41 cc/rev EATON MD 72400 hydrostatic tandem pump and a 245 cc/rev CHAR LYNN 6000 series travelling motor. The overall dimensions of the 6WD transporter are 4850 mm (L) x 2030 mm (W) x 3050 mm (H).

## FIELD PERFORMANCE TEST

The 6WD transporter has been tested in the field to check its performance in actual field conditions. The test parameters were recorded once the 6WD transporter entered the field and started to collect the fresh fruit bunches (FFB). Upon reaching a FFB, the 6WD transporter operator pushes and/or pulls the control lever to activate the cylinder for the Grabber arms that perform the tasks of grabbing, lifting and releasing the FFB into the fruit bin. Finally, the 6WD transporter operator will unload the FFB directly at the collection point.

## ECONOMIC ANALYSIS

The total cost of using the 6WD transporter consists of fixed costs and variable costs. The total fabrication cost for the 6WD transporter is RM 72 500, while the estimated total accumulative operating hours per year amount to 2496.

The achievable 6WD transporter outputs in the field are in the range from 18 and 28 t day<sup>-1</sup>. Based on the maximum capacity of 6WD transporter, which is 3.4 t hr<sup>-1</sup>, the expected operation cost for infield transportation would be RM 4.83 t<sup>-1</sup> FFB.

## CONCLUSION

A 6WD transporter with a special feature of four-wheel steering was designed and developed. This hydrostatic drive transporter is an integrated transporter for collecting and transporting oil palm FFB in the field and for unloading them onto the roadside.

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