

WAKFOOT - THE FFB EVACUATION VEHICLE

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INTRODUCTION

A number of machines for the in-field evacuation of fresh fruit bunches (FFB) have been introduced to the oil palm industry. These machines are generally suitable for use in dry and flat areas, and to some extent in wet areas. The choice of machine is merely dictated by the estates' ground conditions. One system that is well accepted by the oil palm industry is the mini-tractor with a trailer. It performs very well in hard, dry and flat or slightly undulating areas. However, this trail system is not effective in soft and soggy areas. Poor traction prohibits the usage of mini-tractor on soft ground such as in coastal and peat areas. Initially, it was thought that this problem could

be overcome by having flotation tyres fitted on it in place of conventional tyres. However, after a series of field trials, it was found that traction given by flotation tyres was not sufficient. Observations made reveal that this poor traction was due to the trail concept. With the objective of improving the traction especially while working in soft areas, a single chassis machine equipped with six flotation tyres was developed by PORIM.

SYSTEM DEVELOPMENT

A trail system transporter requires a separate mounted trailer for carrying the FFB. This contributes to the total length of the system. A shorter machine



The Wakfoot

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affords better performance in terms of easy manoeuvrability within the plantation. In this respect, a single chassis vehicle would be desirable. Based on the concepts of single chassis and low ground pressure requirement, a prototype machine was built. This machine known as the *WakFoot*, was developed from the mini-tractor. The chassis of the mini-tractor was extended to accommodate the carrier and the rear tyre system. This single chassis machine was then fitted with six flotation tyres. With its big tyre size of 31 X 15.5 - 15 this gives less rolling resistance. The propeller shaft of the transmission systems was modified to suit the new design. The machine was fitted with a 22 PS water-cooled diesel engine and has a carrying capacity of one tonne.

PERFORMANCE TRIAL

The prototype was tested for a total of 400 hours, mostly in soggy and peat areas. Results from these trials indicate that traction improved. In areas where trailed machines would have problems in manoeuvrability, the *WakFoot* encountered no such problem. The *WakFoot* was able to evacuate between 20 to 25 tonnes FFB a day. These results were obtained from trials carried out at different locations and during different fruiting seasons. The machine was operated with three workers, *i.e.* one machine driver and two FFB loaders. Each machine was able to serve between 8 - 10 harvesters. The average fuel consumption was 1.2 litres an hour.

From the above trials, it was found that :

1. This machine performs very well in soft ground area including areas with high water table. The flotation tyres exert low ground pressure, hence giving only shallow impressions on the ground.
2. This machine is more stable when working in undulating areas because of independent and oscillating rear axles.
3. This machine has better traction as the load is evenly distributed on six wheels.
4. This machine has better manoeuvrability particularly in negotiating narrow paths.
5. Areas where manual evacuation are the norm, could be mechanised. This improves productivity and saves manual labour.

CONCLUSION

The *WakFoot* was found to perform well under soft ground conditions and in undulating areas. It has good traction and manoeuvrability.

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