

MOBILE RAMP - FOR MAINLINE LOADING OF OIL PALM FRESH FRUIT BUNCHES (FFB)

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Mainline loading of oil palm fresh fruit bunches (FFB) is either done manually or mechanically. Methods currently practised by estates include:

- I. Manual loading
- II. Net system loading (KULIM system)
- III. Platform ramp loading
- IV. High-lift infield trailer loading
- V. Huka/Hook-lift concept loading

In some of these loading systems, for example manual, net and platform ramp loading, the FFB are handled many times and this increases the free fatty acid content of the oil. To overcome this multiple handling, the high-lift infield trailer and Huka concept were introduced. The high-lift infield trailer unloads the FFB from the field direct into a waiting lorry at the roadside. The integration of the high-lift system to the trailer increases the weight of the trailer by at least 300 to 500 kg, hence, reducing the carrying load capacity. It is also observed that this system is only used at the roadside during the unloading of the FFB. Therefore, what is actually needed is an implement that can do similar job at the roadside without going into the field. Thus, the mobile

ramp was introduced. It is a motorized hydraulic loader. It is powered by a diesel engine which runs a hydraulic pump that activates hydraulic cylinders to unload the FFB and loose fruits into a bin. It will then unload the FFB and loose fruits from the bin into a mainline transporter that carries the FFB to the mill.

DESIGN CONCEPT

Several design concepts have been considered in developing the mobile ramp. The mobile ramp should be easy to handle and efficient. It should also overcome double handling of FFB and replace manual loading at mainline. It is also designed to reduce the worker's back strain and the tendency for theft of FFB.



PROTOTYPE

Feature

The mobile ramp has two containers. The first container is the receiving container of capacity to that of the infield transporter. The receiving container receives FFB from infield FFB collecting machine. It then lifts and tips the FFB and loose fruits into the second container (bin). When this container is full, it is then lifted and the FFB and loose fruits are then tipped into a waiting mainline transporter that carries them to the

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mill. The mobile ramp is powered by a diesel engine which runs the hydraulic pump, that activates the hydraulic cylinders.

Operation

The mobile ramp with a capacity of three tonnes is stationed at a roadside in a harvesting block. Harvested bunches are to be evacuated by in-field FFB transporters with a capacity of 500 kg (in this case Iron Horse or Badang). It is estimated that two to three FFB transporters could service one mobile ramp. The transporters will unload FFB and loose fruits into the receiving container and the operator will empty them into the bin. The FFB and loose fruits are then unloaded into a mainline transporter. When harvesting is carried out at another block a tractor will then transfer the mobile ramp to that block.

FIELD TRIALS

A prototype machine was built and tested. After

several trials and discussions with the estate managers, improvements were made to the first prototype. From the trials it was found that this mobile ramp could evacuate between 15 to 30 tonnes of FFB a day. From these trials, the new system is expected to be very useful in young areas because the number of bunches produced per unit area is higher compared to mature palms. With the system, travel distance of small transporter to the collection point can be minimized. It is also expected that the machine will be useful in hilly areas because of the easy accessibility of the small machine in these areas. The system can also be used in mature palms with few modifications to be made to increase the capacity of the machine. The system may also be used as an alternative for a permanent ramp.

CONCLUSION

The mobile ramp can be an alternative to the current method of mainline loading and it could reduce dependence on manual labour.

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