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Performance evaluation of self propelled walking type vertical conveyor reaper

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SUMMARY : Performance evaluation of vertical conveyor reaper was carried for wheat crop varieties WH 147 and HD 2189. Field performance test of reaper was carried out as per RNAM test code procedure. Cost estimation of harvesting was calculated by using straight line method. The tests were conducted to assess harvested area, operational speed, working speed, working width, stubble height achieved and losses. The average value of the header loss, conveying loss and total machine losses were 0.85 per cent, 3.1 per cent and 3.95 per cent, respectively. The cost of the harvesting by self propelled reaper was found to be Rs. 677.50 /ha. with field capacity 0.13 ha/hr, saving up to 44 per cent cost of harvesting.

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In a grain crop production system harvesting alone requires about 25 per cent of the total labour requirement. There is acute shortage of labour during harvesting season and also grain loss more during harvesting manually. It has been observed that more than 80 per cent of farmers used sickle for harvesting of wheat and remaining used combine harvester on custom hiring. Reapers which are in between sickle and combine is rarely used for harvesting by farmers.

The acceptance, in general, of the available harvesting equipments has been rather slow compared to the other farm operations like tillage, sowing, plant protection etc, owing to the factors involving crop, machine field accessibility and operator/operational parameters

For small size fields the self propelled vertical conveyor reaper can be used for harvesting of the cereal crops like wheat and paddy. It is driven by a 5-hp diesel engine and engine power is transmitted to cutterbar and conveyor belt through belt pulleys or by providing gearbox, which cut the crop and held in vertical position, is dropped in a windrow or unbound bunches. Reaper does not carry provision to bind

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the crop into bundles. Bundling is always done through manual labour. It has high field capacity and farmers in the developing country for harvesting paddy and wheat crops have now adopted good quality of work. Marginal farmer can use reaper on custom hiring, as it is costly. Owing to all above facts vertical conveyor reaper was introduced to farmers and its performance was evaluated.

EXPERIMENTAL METHODS

The self propelled reaper was tested for wheat crop.

Knife register:

A knife is registered by rotating the knife driver manually keeping reaper the cutterbar in level cutting position.

Cutterbar lead:

The cutterbar lead of a mower is usually set 20 mm per meter of cutterbar length. Cutterbar is at right angles to the forward motion during operation when the lead is properly set.

Tension of lugged conveyor belts :

The tension of lugged conveyor belts is adjusted by suitably shafting the drive flat pulley using tension adjustment bolts.

Cost estimation:

The cost of harvesting was calculated by straight line method and by following assumptions: