



**ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY**

**AUTONOMOUS INSTITUTION**

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## **UNIT 5 HARVESTING MACHINERY**

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## **VERTICAL CONVEYOR REAPER**

A machine called vertical conveyor reaper-cum-windrower can cut the crop and lay it in the form of windrow for easy picking. It consists of a conventional cutter bar assembly, crop row dividers with star wheels, covers, pressure springs and vertical conveyor belts. Cutter bar is given reciprocating motion by crank wheel. Crop row dividers with star wheels enter the standing crop, help in lifting, gathering and guiding the crop towards the cutter bar. After the crop is cut, held in a vertical position during its passage by means of pressure springs and star wheels. Vertically held crop is then delivered towards right side of the machine in a windrow perpendicular to the direction of movement of machine with the help of lugged conveyor belt. The gearbox and windrower is coupled to the drive shaft of the prime mover. The output shaft transmits power to the shaft driving the lugged flat conveyor belts and a crank is attached at the lower end of the output shaft to operate the cutter bar through connecting rod. The serrated blade cutter bar with standard knife guards is fitted. The top lugged conveyor belt drives the star wheels on the crop row dividers. Pressure springs are fitted below the star wheels between the conveying platforms to keep the cut crop in upright position while it is being conveyed out of the machine. The power in case of power tiller units is transmitted through an intermediate shaft to the gearbox on windrower either by belt or by shaft drive. In tractor mounted models, the power to the gearbox is transmitted from PTO shaft through gearbox by a long shaft running beneath the tractor body to the front and with the help of universal joint and telescopic shaft which is connected to the gearbox. Lowering and raising of reaper is carried out with the help of hydraulic system of a tractor. In case of power tiller the machine pivots on the power tiller wheels. By pushing the handle, the cutter bar can be raised.

### **Combine harvester**

These are the machines used for harvesting, threshing, cleaning the grain from straw in a single operation. These can be pulled and operated by tractor as well as self propelled combine machines are available. The suitable working speed of combine harvester is 0.8-8km/hr for rice and 2-6km/hr for wheat with the reel speed of 1.25-2.5m in smaller combine and 3-6m in bigger combine with the power requirement of 10hp/meter of cutting width. The self propelled combines are the latest model with the power of 60-150hp/ and cutting or harvesting unit, threshing unit, separating unit, cleaning unit, grain handling/ storage unit and straw handling unit. The power requirement per meter of cutting width in self propelled combine is about 15hp/meter.

### **Functions of a combine harvester**

- Feeding the standing crops to the cutter bar with the help of reel
- Cutting the crop
- Feeding the crop to threshing unit
- Threshing the crop
- Separating the husk from grains



- Cleaning the grains
- Conveying and storing the grains

**Requirement of a perfect combine harvester**

There should be less broken of grains

No grain losses on the ground at the cutter bar end