

Testing & Evaluation of Combine Harvesters

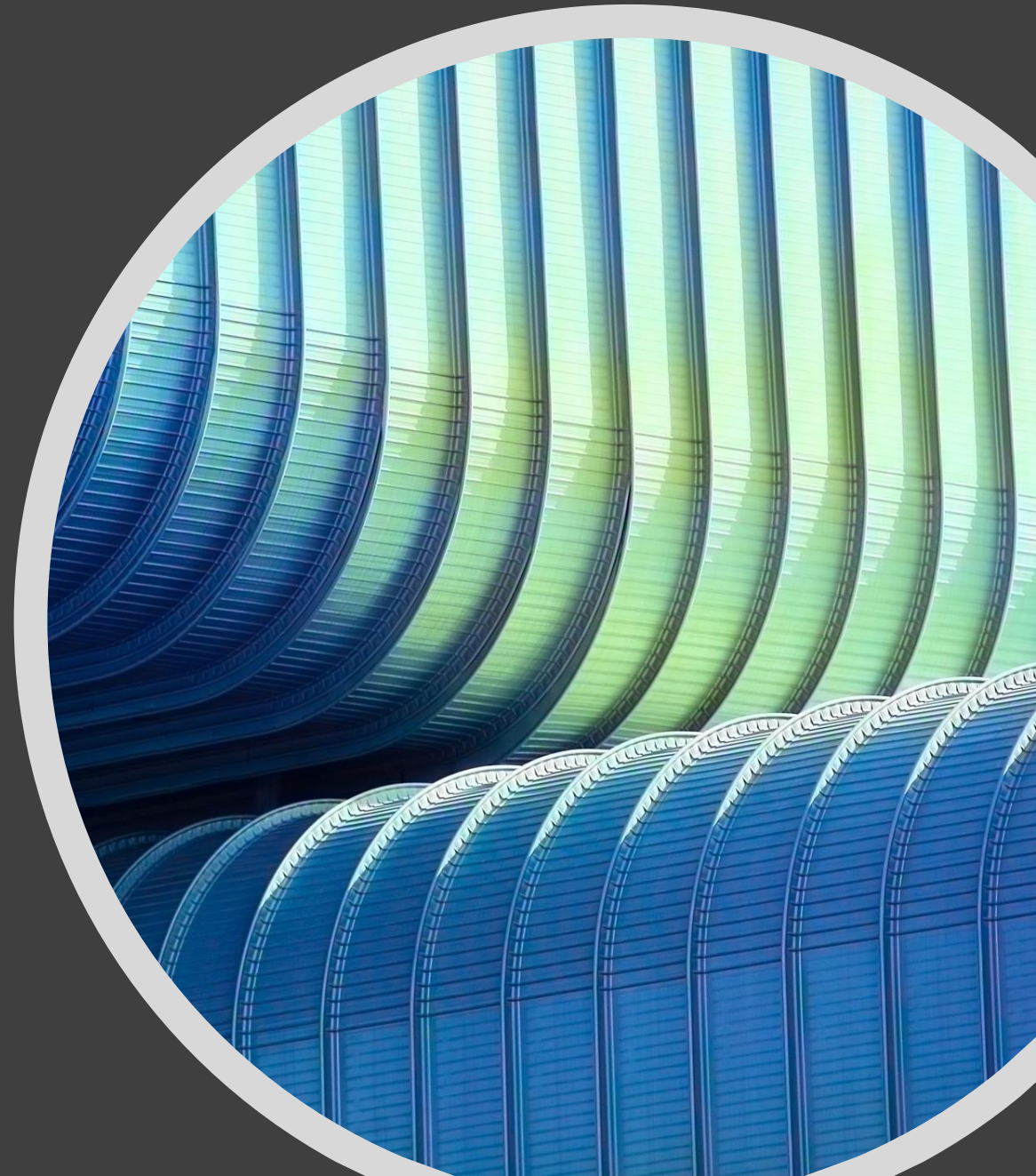
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Combined Harvester

It is a machine that reaps threshers and cleans a cultivated cereal crop in one operation

- There are three major types of combine harvesters that are currently in use:
- **Self-propelled Wheeled Type**
- **Self-propelled Track Type**
- **Tractor Mounted**





Self-Propelled Wheel Type

- These wheeled type harvester machines are excellent for farms with hard soil specially in upland crop harvesting



Track Type

These are fitted with tracks instead of wheels. They are very efficient in areas where wheels are likely to get bogged down. Track combines are commonly used for harvesting rice and some other crops from wetlands.

Tractor Mounted

- These harvesters are driven by tractors that are mounted on top of them. They work best on lands where the soil is loose, and the farmed area is extensively high.



Full Feeding



Head Feeding



Combine Harvesters can be divided into full feed and head-feed depending on the feeding method. The difference between the two is that the full feeding is to send the cut straw and the head to the threshing drum for threshing. Head-feeding is to send only the head/ panicles to the threshing drum for threshing. The first consumes a large amount of power and broke straw. The second only threshes the head, which consumes less power, but the structure is more complicated, and keep whole straw.

MINI COMBINE HARVESTER MACH



Mini Combine Harvesters



Conditions for Optimum Performances of a Combine Harvester

Field Conditions

- Plot Size – Field Capacity
- Soil Moisture Content - soil moisture works as a lubricant between soil particles under heavy pressure from field equipment. Recommended to drain the fields two weeks before harvesting. For testing purposes, we use cone index method to evaluate the soil dryness and that should be 3-5 kg/cm²



Conditions for Optimum Performances of a Combine Harvester

Crop Conditions

- Grain Moisture content 20-25% at the harvesting
- Crop Density
- Planting Method
- Crop Height/ Cutting height
- Standing Crop Angle
- Susceptibility to Shattering

Conditions for Optimum Performances of a Combine Harvester

Machine/
Operation
Conditions

Skill of the
Operator

Operating
Gear

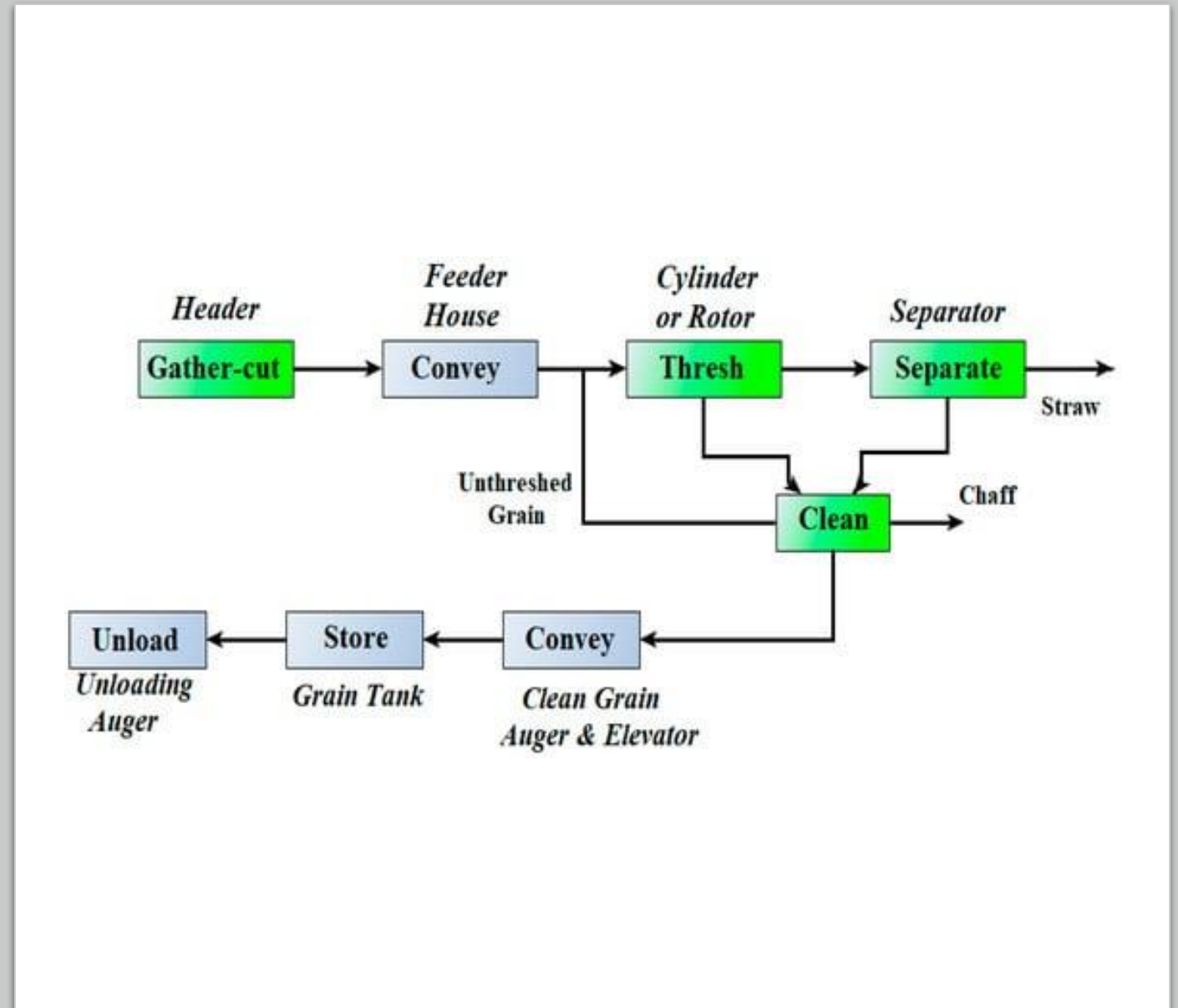
Direction of
Operation

Cutting Speed

Cutting Hight

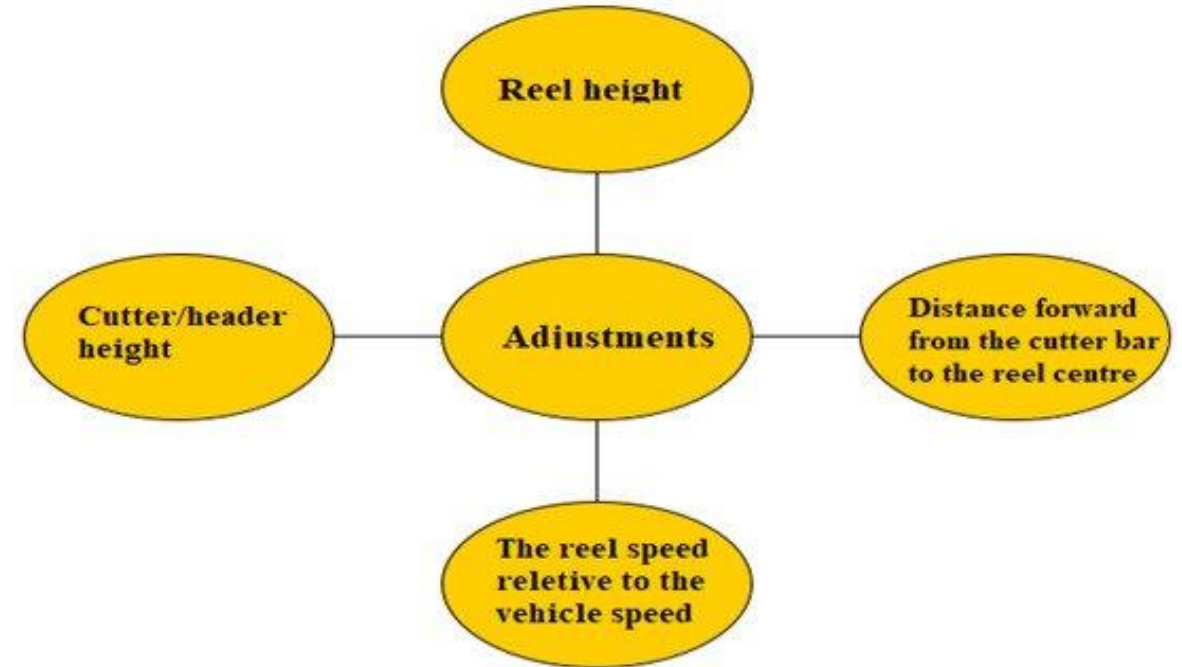
Losses Associated with Combine Harvesters

- Grain Damages
- Header Loss
- Unthreshed Loss
- Separation loss
- Cleaning Losses



Occurs during the process of feeding the crop into the machine header prior to threshing

Header Losses



Unthreshed Losses

unthreshed grain that is left behind by the combine head and transported to the machine's rear via a straw rack. Mechanical threshing loss refers to grain loss caused by an inefficient rubbing action between the cylinder and the concave.



Separation Losses

Quantity of free grain that does not pass through the grates of the separation section

Extra dryness of paddy straws

Machine Settings

Operator Choice



Safety Test

Sound and Vibration

Dust emission

General Inspection for guards and covers

Security alarms

Warning Indicators

Durability Test

Why: To detect failures, identify potential weaknesses of the machine when operating in local conditions

Duration: 300 Working hours in two consecutive harvesting periods



THANK YOU

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