



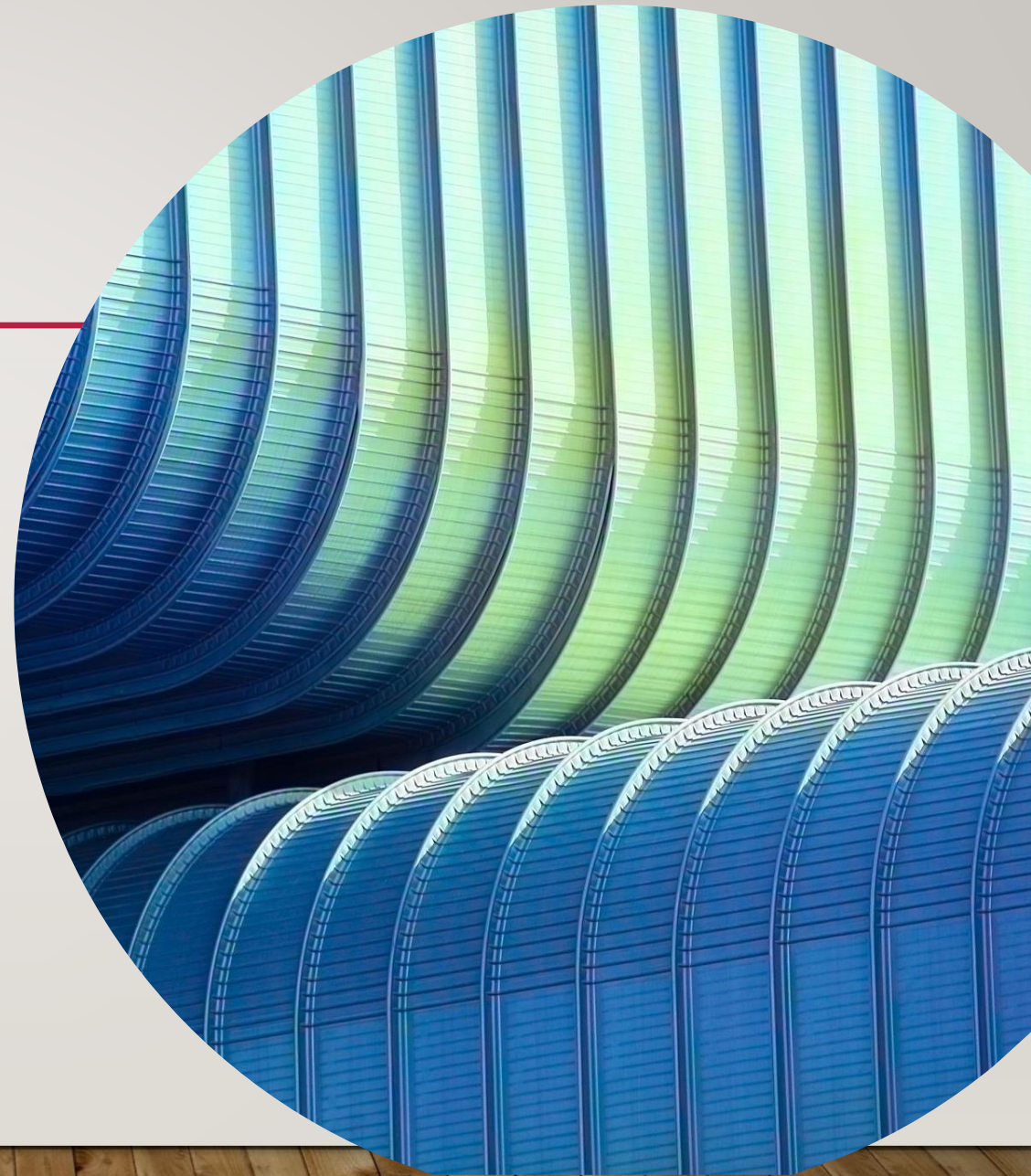
ANTAM 004

TEST CODE ON COMBINE HARVESTERS

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COMBINED HARVESTER

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



IMPORTANCE OF REGULATIONS ON COMBINE HARVESTERS

- High Rates of grain losses are directly affects on global food security
- Low productivity of machinery badly effect on the profit
- High rates of ware and tare reduces the lifespan of machinery
- Spare parts unavailability
- Health and safety issues for the operators
- Negative impact on soil structure of farm fields



ANTAM INITIATIVES

Appointment of TWG Members

Data collection and analysis on present condition of the utilization of Combine Harvesters

Web Training for the TWG members and several other partners to learn from each other

Development of draft code through six virtual technical consultations

Bhutan, Cambodia, China, India, Indonesia, Pakistan, Philippines, Russian Federation, Republic of Korea, Sri Lanka, Thailand, Turkey, Viet Nam

OUTCOMES OF THE SURVEY - TRU

Most of the member countries use small size machineries due to the geographical conditions in farming areas

The size of combine harvesters varying from 60hp – 100hp Middle Range

Main crops are paddy, wheat, maize, legumes and sunflower

Machines are mostly imported except for a few countries having a national manufacturing industry

Some Countries imports slight used secondhand machineries

THE SOLUTION

Harmonized Code for testing of Combine Harvesters in order to assure appropriate machineries in terms of performances and safety.



SCOPE – ANTAM 004

Terminology, general guidelines and tests to be conducted on self-propelled combine harvesters with diesel/petrol engine. It also covers methodology for checking of machine specifications, engine performance, performances with special reference to losses and safety requirements.

CHECKING SPECIFICATIONS

The manufacturer shall provide the specifications in a given format together with following manuals of the machine.

- Operation Manual
- Service Manual
- Maintenance Manual
- Spare parts Catalogue

RUNNING- IN PERIOD

Manufacturer / supplier under the supervision of testing authority, a minimum recommended hours of period to be run the machine as conditioning under light to normal loading operations.

After the running-in a service for the machine should be provided and the supplier is allowed to do the preliminary adjustments

ENGINE TEST

Only applicable for the countries having facilities to test engines in ANTAM approved test procedures and test standards.

Maximum Power at Rated Engine Speed

Five hours rating test

Varying Load Tests

Natural Ambient Test

Power at Rated Engine Speed

For the countries do not having the facility to test engines, shall request an engine test report from the supplier or the manufacturer

FIELD PERFORMANCE TEST

- Main performance test can be applicable on the following crops: rice (Indica and/or Japonica), wheat, corn, beans (soybean) or sunflower.
- The test shall be carried out to assess
 - i) the quality of work including losses of grain and damage to grain, and impurities contents when harvesting and
 - ii) the rate of work including machine behaviors and fuel consumption

FIELD CONDITIONS

- Flatness and regularity of surface
- Dryness and hardness of soil / Soil Moisture
-



MACHINE CONDITIONS

Machine/
Operation
Conditions

Adjustments

Operating
Gear

Direction of
Operation

Cutting Speed

Cutting Hight

CROP CONDITIONS

- **Variety of crop**
- **Maturity**
- **Moisture content of grain and straw, respectively**
- **Uniformity**
- **Disease and weeds**
- **Standing status**
- **Populations (row hill distance, rice stems/hill, plants/m²)**
- **Normal MOG:G ratio**
- **Average grains number and weight per stem**
- **Height of plant**
- **Maximum and minimum ground height of grain or pod**
- **Degree of stem angle**
- **Other items necessary**





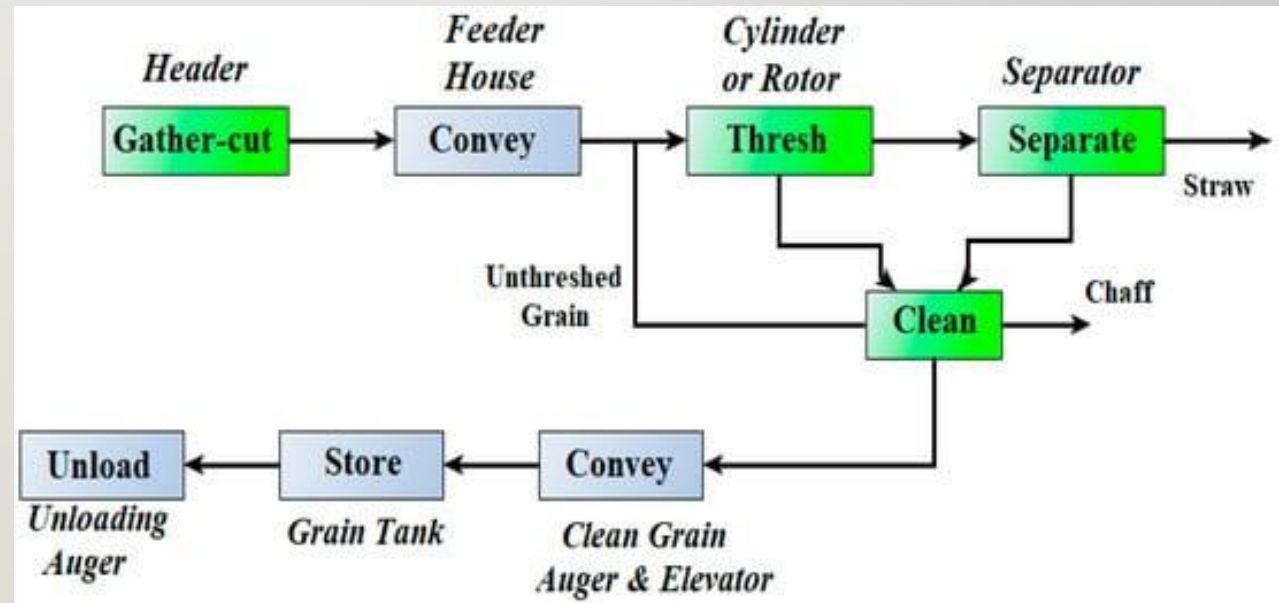
SKILLS OF THE OPERATOR

- Handling with minimizing non-productive times
- Skills to work with lodge crops
- A training certificate or valid license on combine harvester operations
- Knowledge on modern technologies of combine harvesters like GPS and auto steering

ASSESSMENT OF WORK QUALITY

- to test harvest losses of grains, damaged grain and impurities during harvesting for a given crop or field conditions.

- Head Loss
- Cylinder Loss
- Separation Loss



Total Losses and the total damage percentage is to be calculated. Acceptance limit has to be set

ASSESSMENT OF RATE OF WORK

- Field Capacity
- Fuel Consumption



TURNING ABILITY TEST

- **Turning radius has a great impact on field efficiency. The larger the turning radius, the more space the machine will need to turn around. That is, more time will be spent on turning.**
- Diameter of the minimum turning circle (m)
- Diameter of the minimum turning space required (m) while turning the machine

PARKING BRAKE TEST

To test the ability to hold the combine harvester stationary, facing up and down on slopes.



NOISE AND VIBRATION

- **Noise Measurement at By-stander Position**
- **Noise Measurement at Operator Ear Level**
- **Excessive exposure can affect the nerves, blood vessels, muscles and joints of the hand, wrist and arm causing Hand-Arm Vibration Syndrome.**
- **Vibration Measurements**
- **Vibration Acceleration Measurements**



OTHER SAFETY REQUIREMENT

Guards

Controls

Lighting

ROPS

Warning Indicators / Security alarms

DURABILITY TEST

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

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

WAY FORWARD

- Test Procedures
- Testing Equipment
- Data Collection
- Calculations
- Assessment
- Test Certification



THANK YOU