



ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY

AUTONOMOUS INSTITUTION

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AI3501 FARM EQUIPMENT AND MACHINERY

UNIT 1



Animal drawn ploughs

Animal drawn ploughs are traditional agricultural tool used for tilling the soil. The plough is attached to a draft animal such as an ox, cow, bullock and buffalo which pulls it along the field.

The plough is used for a number of different field operations that include ploughing, row-marking (for crop establishment), ridging and weeding. Mainly for primary and secondary tillage. This plough is used for no. of different field operations include ploughing, row marking, ridging and weeding. During ploughing, the plough cuts, breaks, loosens, inverts the soil and buries weeds, crop residues and manure.

The most common animal-drawn tillage implements in developing countries are mouldboard ploughs, ards, hoes, harrow, ridgers and cultivators.



ANIMAL TOOTH HARROW

DRAWN SPIKE

The animal drawn spike tooth harrow is usually of rigid type. These may or may not have provisions for changing the angle of spikes in operating conditions. This harrow mainly consists of teeth, tooth bar, guard rail, clamps, braces, levers and draft hooks. The teeth are made up of hardened steel with square/triangular/circular in section. The teeth are so placed on tooth bar that no tooth is directly behind the other. Teeth are fastened rigidly to the tooth bar. Clamps are rigidly fixed so as not to be loose while in operation.

There are 2 types of animal drawn plough: one way plough and two way plough.

1. One way plough – It turns soil to the right hand side. One way plough requires laying out a field in lands, starting with back furrow and ending with dead furrow.

Animal drawn 2 way plough is also called as turn wrest plough

Two way plough – It turns soil to both the sides (right and left). Two sets of bottom are mounted on a common frame that is rotated about a longitudinal axis to change from one set to another.

Types of Implements:

1. Pull-type or traileed implement :

It is pulled and guided from a single hitch point and is not completely supported by the tractor.

Eg: Trailed mould board plough



2. Mounted Implement :

It is hitched to the tractor through a three-point linkage in such a manner that it is completely supported by the tractor when in the raised position. The linkages provide a rotational stability about the longitudinal axis and permit depth or height control by the vertical support from the tractor.

Eg: A mounted disc plough



3. Semi-Mounted Implements

It is attached to the tractor through a horizontal or nearly horizontal hinge axis and is partially supported by the tractor at least during transport, but it is never completely supported by the tractor. In heavy and large semi-mounted implements supports wheels at the rear or in the middle together with remote hydraulic cylinder are utilized for raising and lowering the complete implement/machine or its individual units.



4. Self-propelled machine.

One in which propelling power unit is an integral part of the implement/machine.

Advantages of Mounted Equipment:



1. Mounted equipment are less expensive than equivalent pull-type equipment.
2. Support wheels and accompanying structure required on pull type equipment is eliminated.
3. Single depth or height control system forming a part of the tractor.

Maneuverability is better

Visibility is better

Transport is easier

Draft-sensing advantage

Vertical load transfer to aid in traction

Attaching & detaching is easier

Standardisation of Three-point hitch and “Quick-attaching couplers” to permit interchangeable use of different makes of equipment.

Limitations of Mounted Implement:

1. Carrying capacity of tractor chassis
2. Transport stability is a limitation

Advantages of Self-propelled machine:

- Greater flexibility
- Better maneuverability
- Better visibility
- Better control by operator



- Improved mobility
- Reduced losses when cutting unit is in front of the unit.

Disadvantages:

- Greater initial investment. It must have higher annual use to be economically competitive with a pull-type machine.