

STUDY ON THE PLOUGHING OPERATION BY A POWER TILLER

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Ploughing

Ploughing is the process of opening the soil with the help of plough. Ploughing is the principal tillage operation, which aim to produce a good tilth required for making a good seed bed and providing better soil condition for plant growth.

Principles of ploughing

- Ploughing at the right moisture condition (zoe condition).
- Ploughing the soils those are hard and the physical condition is poor.
- Using right types of plough.

Some glossary of terms on ploughing

Furrow: The 'V'-shaped opening by a country plough at the time of ploughing.

Ridge: The raised part of soil between two furrows is termed as ridge.

Furrow stripe: The unploughed land or narrow stripe between two 'V'-shaped furrow made by country plough is termed as furrow stripe.

Furrow slice: Thee soils which come out while making furrow by country plough.

Pulverization: The process of alteration of soils and conversion into small pieces or dust is termed as pulverization.

Plough pan: The hard layer formed under the certain depth of soil surface due to continuous ploughing by a same plough in the same land for several years is known as plough pan.

Tilth: The physical condition of soil after tillage.

Procedure of ploughing by a power tiller

- We the students of 'Group- *' of B.Sc. Ag. (Hons.) Level-1 Semester-I, 2023 performed ploughing operation with a power tiller equipped with rotary plough (rotovator).
- First, we have picked an appropriate tilling depth and speed which was controlled by an unit. As our plot was moderately hard we fixed in a medium depth.
- Then we started ploughing from a corner and maintained straight rows. We used the tiller's controls to slowly work our way down the plot in a straight line, turning around and doubling back at the end.
- We have also re-tilled to break down the soil. Any clods were broken into roughly dime-sized pieces or smaller.
- At the end of ploughing the land was leveled down by a leveler.



Calculation of ploughing efficiency

Length of the land: 30 m

Breadth of the land: 6 m

Area of the land = 30 × 6 m = 180 m²

Time of ploughing: 20 min

We know,

$$\begin{aligned} \text{Efficiency} &= \frac{\text{Area}}{\text{Time}} = \frac{180 \text{ m}^2}{20 \text{ min}} \times \frac{1 \text{ ha}}{10000 \text{ m}^2} \times \frac{60 \text{ min}}{1 \text{ h}} \times \frac{8 \text{ h}}{1 \text{ working day}} \\ &= \frac{180 \times 60 \times 8}{80 \times 10000} \frac{\text{ha}}{\text{working day}} \\ &= 0.432 \text{ ha working day}^{-1} \end{aligned}$$

Factors affecting the efficiency of ploughing

- The condition of the field
- The condition of the bullocks
- The types of plough
- The ploughing depth
- Expertise of the ploughmen
- The weather conditions of the day

Quality of good ploughing

- There will be no unplowed land or furrow stripes
- Furrows should be straight
- Furrows should be of same depth
- Ploughing should be criss-crossed
- Clods should be minimum
- The field must be free from weeds, stables, straws etc.
- Corners and ails should be well-spaded

Precautions of ploughing

- Engine gears and clutch should be controlled properly
- Care should be taken to save the legs from the rotovator

