

2 TYPES OF FARM MACHINERY AND THEIR FIELD MANAGEMENT REQUIREMENTS

Classification of Machinery used for crop production and processing

Farm machinery used for crop production and processing can be classified into land clearing, tillage equipment, sowing and planting equipment, crop protection equipment, harvesting and post harvesting equipment.

Farm Machinery Management

1. Machine capacity:

Machine system capacity is an operating characteristic determined by the rate of work achieved in operation and the amount of time over which the machine is operated. Capacity can therefore be defined as the quantity of crop (area, weight or volume) that can be handled in a given time period (season).

Machine capacity depends on:

- Rate of work – ha/hr, tonnes/hr
- Time available, hr

Factors that affects machine rate of work are:

- (a) operating characteristics of machine system (or component)
- (b) biological characteristics of crop being processed, yield and intensity of cropping.
- (c) environmental characteristics; weather conditions- influence soil conditions and trafficability.
- (d) operating decisions; knowledge of work situation, skill with machine.

Factors that affects machine time availability

- (a) the physical characteristics of the machine component or system.
- (b) biology characteristics of crop.
- (c) environmental characteristics of production situation.
- (d) operator decision.

Machine Field Performance

Farmers are constantly striving for more field- operation capacity and efficiency most especially with tillage operation

Basically three factors controls machine capacity and performance which are:

- Machine width or size
- Operation speed
- Time spent in operation

Terms related to field performance of machines

The rate at which a machine can cover a field while performing its intended function is one of the considerations in determining the cost per unit area for the operation.

- **Theoretical field capacity (TFC)**

This is the rate of field coverage that would be obtained if the machine were performing its function 100% of the time at the rated forward speed and always covered 100% of its rated width.

- **Theoretical time per hectare**

It is the time that would be required at the theoretical field capacity.

- **Effective field capacity**

It is the actual average rate of coverage by the machine which is expressed as hectares per hour.

- **Effective operating time-** is the time during which the machine is actually performing its intended function.

- **Field efficiency**

This is the ratio of effective field capacity to theoretical field capacity, expressed as percent.

- **Performance efficiency**

It is the measure of the functional effectiveness of a machine, e. g. the percent recovery of usable product by a harvesting machine.

$EFC = SW/10 \times Ef/100$ where: EFC = effective field capacity, ha/hr

km/hr

implement, m

$TFC = W \times S/10$
capacity

$Ef = EFC/TFC \times 100$

S = speed of travel,

W = rated width of

Ef = field efficiency, %

where: TFC = theoretical field