

# AGRICULTURAL SCIENCE

## REASONS FOR MAINTAINING FARM MACHINES

- For better mechanical efficiency of the machine.
- To prolong the life span of the machine's engine.
- For replacement of worn parts.
- To improve the output of the machine.

## Maintenance of farm machines (e.g: a farm tractor) on

### (A) Daily basis:

- Check and top the hydraulic.
- Check for flat tyres and pump them.
- Tighten loose bolts and nuts.
- Wash the tractor after use.
- Check the water level in the radiator.
- Check the oil level in the engine.
- Fill the fuel tank if fuel level is low.
- Gauge the electrolyte level in the battery.

### (B) Periodic basis:

- Clean or change the oil filter.
- Replace spent engine oil with a new one.
- Replace the fuel injector.
- Paint the tractor.
- Weld broken metal parts.
- Adjust or replace the fan belt.
- Replace worn-out tyres.
- Check the electrical system.
- Grease metal parts to prevent friction or rusting.

## Mechanised farm operations include:

- Tree felling.
- Land levelling.
- Ploughing.
- Harrowing.
- Ridging.
- Planting.
- Weeding.
- Harvesting.
- Processing.
- Threshing.

Drying.  
Grinding.  
Shelling.  
Incubation.  
Refrigeration/Freezing  
Candling.

### **FARM MECHANISATION.**

It is the introduction of farm machinery and implements into farming in order to improve agricultural productivity.

It also involves the use of improved seeds and seedlings, improved young animals, agro-chemicals improved farming techniques, as well as good marketing strategies.

### **Merits of mechanisation.**

It speeds up farm operations.  
It encourages commercial agriculture.  
It reduces the cost of production.  
It leads to drudgery.  
It leads to increased farmers' income.  
It promotes specialisation of labour.  
It improves the quality of farm products.  
It reduces health hazards of workers.  
It discourages the use of out-dated cultural practices that have negative effects on the soil.

### **Demerits of mechanisation**

It causes unemployment.  
It destroys the soil structure.  
It causes environmental pollution.  
It reduces soil fertility.  
It is very expensive to practise.  
Spare parts are not easily available.

### **Limitations of mechanisation**

Small farm-holdings.  
The poverty of farmers.  
Illiteracy of farmers.  
Seasonality of some crops in the tropics.  
Lack of basic amenities.  
Lack of technology.  
The poor network of roads.  
Inadequate storage and processing facilities.

Inadequate spare parts.

Poor topography.

### **Prospects of mechanisation include:**

Farmers should be educated to embrace new and improved methods of farming.

Farmers should be motivated to acquire and cultivate large hectares of land.

Simple and cheap farm machines should be developed locally.

Farmers should be provided with credit facilities.

Government should set up agro-service centres.

Farmers should form co-operative societies.

## **FARM POWER**

Farm power is the rate of doing work on a farm.

### **Sources of Farm Power.**

#### **Human power:**

##### **Merits:**

(i) It is the most intelligent source of farm power.

(ii) It is easily controlled.

(iii) It is easily available.

(iv) It is required in all farm operations.

##### **Demerits:**

(i) Man easily gets tired.

(ii) Output is low.

(iii) Human labour is expensive.

#### **Animal power**

It is a cheap source of power.

It is cheap to maintain.

It is easy to operate.

Animals can operate in rugged terrains.

##### **Demerits:**

Productivity is low.

It is limited to some kinds of farm operations.

Animals are prone to infections by pests and diseases.

It is unsuitable for processing farm products.

Animals pose a threat in the field

#### **Mechanical power.**

##### **Merits:**

(i) It reduces waste of time and energy.

- It is an efficient source of farm power.

It can be used in all farm operations.  
(iv) Yield is high.  
It does not depend on weather conditions for its operations.

**Demerits:**

It is very expensive to establish.  
It requires specialisation.  
Spare parts are not easily available.  
It leads to environmental pollution.  
It destroys the soil structure.

**Solar power**

**Merits:**

(i) It is a cheap source of farm power.  
(ii) It is a neat source of farm power.  
(iii) It is obtained freely.

**Demerits:**

It is expensive to harness and store.  
It is not reliable.  
It is erratic.  
It can only be stored during the day.

**Electrical power.**

**Merits:**

(i) It is a very efficient source of farm power.  
(ii) It is versatile.  
(iii) It is a neat source of power.  
(iv) It is fairly reliable.

**Demerits:**

(i) Maintenance cost is high.  
It may lead to electrocution.  
It may cause fire-outbreak.  
Supply may be irregular.

**Water power.**

**Merits:**

(i) It is relatively cheap to operate.  
(ii) It is used to generate electricity.

**Demerits:**

(i) It is not reliable especially during the dry season.  
(ii) It is costly to set up initially.

**Wind power**

**Merits:**

(i) It is cheap to practise.

It is easily available.

It is a renewable source of power.

**Demerits:**

(i) Wind is erratic.

It can not be stored.

It can only operate during windy periods.

**Fuel power.**

**Merits:**

(i) It is cheap to obtain.

(ii) It is always available.

**Demerit:**

(i) Some fuels are highly inflammable.

**Biogas**

**Merits:**

(i) It is cheap to obtain.

(ii) It is easily available.

**Demerits:** It is bulky in nature.

It gives off an offensive odour.

It is not a neat source of power

## **CLASSIFICATION OF CROPS**

**Crops are classified based on their:**

Food values/uses.

Life cycles.

Seed morphology.

### **Classification of Crops Based On Food Values/Uses.**

**Cereals:** Their seeds are rich in carbohydrates for energy (eg: maize, rice, millet, guinea corn, barley oat, wheat, rye).

**Pulses:** their seeds are rich in proteins for body growth (eg: cowpea, soya bean, groundnut, pigeon pea).

**Tuber crops:** Their swollen underground stems or roots are rich in starch for energy (eg: yam, cocoyam, cassava, potato).

**Vegetables:** Their leaves and fruits are rich in vitamins and minerals and are eaten fresh.

## **Vegetables are divided into three groups:**

*Fruit vegetables:* have only their fruits as the edible parts (eg: tomato, okra, carrot, garden egg, watermelon, cucumber, pumpkin, fluted pumpkin, pepper).

*Leafy vegetables:* have their leaves as the only edible parts. (eg: waterleaf, onion, cabbage, amaranthus, lettuce).

*Dual-purpose vegetables:* have both fruits and vegetables as edible parts. (eg: garden egg, pumpkin, fluted pumpkin).

*Beverages:* have fruits and seeds used in making beverage drinks. (eg: cocoa, coffee, tea, kola).

*Latex crops:* are used in making rubber products. (eg: rubber tree ).

*Oil crops:* have fruits and seeds that are rich in oils used for domestic purposes (eg: oil palm tree, coconut, castor oil tree).

*Citrus crops:* have seeds that are rich in minerals and vitamins (eg: orange, grapefruit, tangerine, lemon, lime).

*Fibre crops:* produces fibre for making clothes (eg:cotton).

*Spices:* are used in seasoning and flavouring our foods (eg: ginger, garlic, pepper, onion, curry plant, nutmeg, mustard).

*Fruit crops:* (eg: banana, plantain, pawpaw, pineapple, cashew, avocado pear, mango, guava).

*Forage crops:* are used in feeding livestock (eg: forage grasses and legumes).

## **Classification of Crops Based on their life cycles**

**Annuals:** are crops that grow and mature within one year (eg: cereals, pulses, yam vegetables, cotton, pepper, tea, coffee).

**Biennials:** are crops that grow and mature within two years (cassava, yam, potato, banana, plantain).

**Perennials:** are crops that grow from year to year (eg: all citrus, oil palm tree, coconut, cocoa, rubber, cashew, mango, etc).

**Ephemerals:** are crops that have several life cycles in a year (eg: tomato, waterleaf, maize, okra, etc).

## **Classification of Crops Based on seed morphology**

**Monocotyledons:** are crops which the seeds have one cotyledon (eg: rice, maize, barley, guinea corn, millet, sugar cane, oil palm, banana, plantain, pineapple, ginger).

**Dicotyledons:** are crops which the seeds have two cotyledons (eg: cowpea, groundnut, soya bean, yam, cocoa, cocoyam, cassava, potato, orange, mango, cashew, grapefruit, lime, pawpaw, tomato, okra, kola, garden egg, watermelon, cocoa, coffee, rubber, cotton).

## **Differences between monocots and dicots.**

Monocots have one cotyledon, a fibrous root system, parallel venation, and pollinated by wind while Dicots have two cotyledons a tap root system.