



# FIRM FOUNDATION COUNTRY SCHOOL

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CANDIDATE  
NAME

CANDIDATE  
CLASS

**AGRICULTURE**

**0600**

**FORM ONE**

**HOLIDAY WORK 2026**

## **INSTRUCTIONS**

- Notes can be printed or hand written, if printed they should be pasted in the note book
- Exercise to be written in the test exercise book
- Notes and exercise to be submitted soon after check-in

## Humidity

• Humidity is a measure of the amount of water vapor in the atmosphere, it is measured using a hygrometer (wet and dry bulb thermometer).

### Effects of high humidity

#### Positive effects

- slows down the rate of evaporation therefore leads to water retention in the soil
- slows down the rate of transpiration therefore prevents crop wilting.

#### Negative effects

- encourages growth and spread of fungal diseases in plants e.g. early and late blight in tomatoes, grey leaf spot in maize, damping off of seedlings
- encourages multiplication of pathogens in fowl runs.

### Effects of low humidity

#### Positive effects

- Less growth and spread of fungal diseases
- Less multiplication of pathogens in fowl runs

#### Negative effects

- Increased rate of evaporation and transpiration leading to wilting of plants
- reduce the rate of photosynthesis leading to slow growth rate.

## Wind

• is the air in motion caused by differences in atmospheric pressure.

### Importance of wind

- Required for pollination of some plants i.e. wind pollinated crops e.g. maize.
- Helps seed dispersal.
- It has a cooling effect on crop as it increases the rate of transpiration.

### Effects of wind

- Strong winds damage flowers, break tree branches and cause lodging of crops therefore reduce yield.
- It increases the rate of evapotranspiration and therefore crop wilting.
- Spread pests and diseases.
- Causes soil erosion.

## Sunshine

**Sunshine is vital for agriculture because it drives photosynthesis, crop growth, and livestock productivity, but too much or too little sunlight can limit land use by making certain areas unsuitable for farming. In Zimbabwe and similar regions, sunshine patterns directly influence what crops can be grown, when they can be planted, and how land is managed.**

### How Sunshine Affects Agricultural Activities

- **Photosynthesis:** Sunshine provides the energy plants need to convert carbon dioxide and water into sugars. Without adequate sunlight, crops grow poorly and yields decline.
- **Crop Selection:** Different crops require different amounts of sunlight. For example, maize and sorghum thrive in full sun, while leafy vegetables may suffer under excessive heat and light.
- **Seasonal Planting:** Farmers time planting seasons based on sunshine hours. Longer daylight in summer supports rapid growth, while shorter days in winter slow development.

- **Livestock Productivity:** Sunshine influences pasture growth, which affects grazing availability. It also impacts animal health (vitamin D synthesis) and water needs.
- **Drying & Processing:** Sunshine is used for drying crops like tobacco, maize, and groundnuts, reducing reliance on artificial drying methods.

### How Sunshine Limits Land Use

- **Excessive Heat & Aridity:** Too much sunshine without adequate rainfall leads to drought, soil degradation, and desertification, making land unsuitable for crops.
- **Uneven Distribution:** Areas with extreme sunlight exposure may only support drought-tolerant crops, limiting agricultural diversity.
- **Soil Moisture Loss:** Intense sunshine accelerates evaporation, reducing soil moisture and increasing irrigation demands.
- **Land Suitability:** Regions with insufficient sunlight (e.g., shaded valleys or areas with persistent cloud cover) may not support crops that require high light intensity.
- **Climate Change Effects:** Rising temperatures and prolonged sunshine periods can shift traditional farming zones, forcing farmers to abandon or adapt land use.

### Population Growth and Agriculture

- As population increases, **demand for food rises**.
- More people require more land for housing, roads, and industries, reducing land available for farming.
- Farmers must produce **higher yields from limited land**.

### Need for Efficient Land Use

- **Intensive farming methods:** Using fertilizers, irrigation, and improved crop varieties to maximize output.
- **Crop rotation:** Prevents soil exhaustion and maintains fertility.
- **Mixed farming:** Combining crops and livestock to use land more effectively.
- **Mechanization:** Efficient use of machinery reduces labor and increases productivity.
- **Land conservation:** Preventing soil erosion, deforestation, and degradation ensures long-term use.

**NB .** Population growth forces farmers to **intensify production, conserve resources, and plan farms carefully** to ensure food security and sustainable land use.

### Principles of agricultural economics

#### Organic Farming

Organic farming is a set of agricultural practices that focus on producing food while preserving the environment and avoiding synthetic farming and agricultural material. Organic farmers work to a strict set of standards to ensure that their farms sustain the health of: soil, ecosystems, animals and people.

## **Principles of organic farming**

Organic farming advocates four key principles which are:

Health

Ecology

Fairness

Care

These principles govern all the process stages including production, processing delivery; storage and consumption

### **1) Health**

The principles of health in organic farming involve avoiding the use of harmful chemicals leaving toxic residues that have a negative impact at multiple levels affecting soil micro fauna and mesofauna, soil organisms, crops, animals and humans.

### **2) Ecology**

The principle of ecology in organic farming suggest the utilization of environmental friendly techniques such as crop rotation, green manuring and recycling or soil regeneration process, It also means providing favorable living conditions for the whole ecosystem, thus maintaining proper balance and saving natural resources.

### **3) Fairness**

The principle of fairness in organic farming dictates a decent and respectful attitude towards all those Involved in the business: farmers, suppliers, traders, consumers. It encourages appropriate working and living conditions, and supports people's need for sufficient supplies of quality food products, it also involves providing proper feeding and environment for livestock. Pricing policies should be Justified and affordable.

### **4) Care**

The principle of care suggests sparing consumption of resources with concern about nature and the upcoming generation. Applied farming technologies should be thoroughly looked into and assessed as to their negative consequences, Furthermore any decision making should be governed by precaution and timely risk management.

## **Organic farming practices**

The common and approved techniques include the following:

### **1. Crop rotation**

Crop rotation Involves replacing species on the same field season by season. It may also include a fallow period within a certain Interval time. Crop rotation:

- Controls pest and wood Infestations, as well as chemical contaminations
- Prevents soil erosion with different root systems
- Protects soil from depletion as different plants have different nutritional needs, and a legume adds nitrogen to the soil naturally,
- Boost yields and reduces costs.

### **2) Cover cropping**

Cover cropping Involves the covering of the land with any plant species, either for a certain season or perennially, partially between the crop rows or completely.

Cover crops:

- Prevent soil erosion by reducing direct Impact of rain on the soil surface and by reducing soil water evaporation.
- Improve water filtration and aeration with their roots.
- Eliminate weeding. Reduced sunshine prevents the germination and development of weeds

Examples of crops used include sweet potato, pigeon pea ,millet and oats.

### 3) Green manuring

Green manure is a type of organic fertilizer where entire fresh plants or plant parts are used as a nutrient source in agricultural fields, without any prior decomposition or composting.

Examples of crops used include

- Green peas
- Soybeans
- Cowpea
- Fenugreek
- Chick pea
- Moringa
- Guatemala grass

Green manuring

- Enriches the soil with organic matter including nitrogen
- Increases moisture content of soils
- Adds nutrients for soil microfauna and mesofauna
- Reduces weed infestation
- The overall soil quality is improved, including a better structure

### 4) Animal manures

Organic farming involves the use of natural fertilizers such as animal manure, either raw or composted (excluding slaughter by products). However, some restrictions are imposed, namely:

- The material must not contain any synthetic additives
- The soil must be tested before applications, as regard of any likely contamination

### 5) Integrated weed management

Integrated weed management involves the control and reduction of weed infestation in the fields by incorporating diverse techniques (prevention, biological, physical and cultural). Some of these techniques are:

- Avoiding weed introduction into the field through machinery, animals, irrigation water
- Manual weeding
- Crop rotation
- Mulching
- Use of natural chemicals to hinder germination
- Haymaking before weed seeding
- Introduce populations of birds/insects to consume weed seeds

### 6) Integrated pest management (IPM)

Organic farming does not intend to destroy pests completely as it may cause changes in the ecosystem. IPM uses a variety of pest management techniques focused on pest prevention, pest reduction and the elimination of conditions that lead to pest infestations. Some of these techniques are

- Prevention
- Constructing natural barriers
- Physical removal
- Tackling pest invasion with their biological enemies (predators) like ladybird v/s aphids.
- As far as synthetic additives are concerned, IPM include only mild pesticides approved for organic farming, without disputable properties and minimum harm to humans and nature. Some of the additives allowed are:
- Soap, hydrogen peroxide, baking soda, sulphur or natural pest repellents like neem, citronella and lavender oil.

## **7) Livestock management**

Organic agriculture excludes the use of synthetic medications, growth-boosting drugs and hormones, antibiotics, non-organic forage, GMO's, clones for livestock breeding. It must provide proper conditions for raising and grazing and create a suitable environment for livestock breeding. The animals should be given plenty of space and fresh air and raised under conditions that suit their natural behavior.

## **8) No genetic modification**

Organic standards ban the use of Genetically Modified ingredients, and animals on organic farms must be fed a natural organic and non-GM diet.

## **Benefits or advantages of organic farming**

### **1) Encourages soil vitality and prevents soil erosion**

Organic farming practices, such as crop rotation, cover crops and minimal tillage, strengthen the natural vitality of the soil. They help the soil to remain more compact, thus minimizing erosion.

### **2) Reduces ground water and air pollution**

Chemical fertilizers and pesticides significantly contribute to ground water pollution organic farming these products are prohibited, thus reducing water pollution.

### **3) Helps to reduce climate change**

A large amount of fossil fuel is used by the agrochemical industry. Organic farming helps to reduce fossil fuel consumption as these agrochemical products are prohibited.

### **4) Encourages greater biodiversity**

Organic farming maintains the diversity of biological flora and fauna, pollinators and pest predators.

### **5) Limits GMO usage**

Organic farming avoids the use of genetically modified organisms as much is still to be learned about their impact on food and health issues

### **6) Ensures food quality and certification**

### **7) Products of better taste and nutritional value**

## **Disadvantages/challenges of organic farming**

### **1) High implementation cost**

The process of organic farming is labor-intensive, for instance much labor and time is needed for manual and mechanical work, crop observation and compromised compliance with standards. It includes many other implementation cost that can be difficult for a farmer to bear.

### **2) Education-intensive**

Many modern farmers are unfamiliar with organic farming practices so they need to learn proper methods and best practices.

### **3) Inconsistent returns**

Since organic farming relies on crop rotation, not all crop bear the same returns for farmers and it may even lead to low yields.

### **4) Vulnerability to major loses**

Because synthetic fertilizers and pesticides are prohibited, farmers may be at risk of losing significant portions of their yield.

### **5) Long transition for certification**

It is only after 3 years or so of organic farming on his land that the farmer can label and market his products as organic. Therefore, in the meantime the farmer has to bear the costs of transition without being able to charge commensurate/adequate prices

### **6) Frequent pest and weed control, Instead of one-time chemical application**

### **7. Higher prices of organic products v/s conventional ones**

### **Is organic farming sustainable?**

Organic farming helps to keep a balance in the ecosystem and spares natural resources. It ensures the availability and productivity of lands for the future generation. Organic farming is sustainable in the following aspects

1. Improves soil quality
- 2 Reduces pollution through recycling and limitations of chemicals
- 3 Enhances the ecosystem biodiversity
4. Saves energy and resources
5. Applies non-chemical methods of pest and weed control
5. Provides natural conditions to support livestock needs and behavior

**NB: notes can be printed or hand written**

### Exercise

- 1) Discuss the negative effects of the following on agriculture:
  - a) Humidity (2)
  - b) Wind (2)
  - c) Sunshine (2)
- 2) What is the importance of wind to agricultural activities? (2)
- 3) How can food production be increased to meet growing population.(2)
- 4) Describe what is meant by organic farming. (1)
- 5) List and explain the possible advantages and disadvantages of an organic farming system. (4)
- 6) Is organic farming sustainable? (2)
- 7) List any three principles of organic farming (3)

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