# P4 integrated Science

## term 1

### THEME: World of Living Things

### Topic 2/4: Growing Crops

## Common crops

Common crops are classified as

**Food crops**

Food crops can be classified as

(i) Cereals for example wheat, maize, rice and millet

(ii) Legumes for example peas and beans,

(iii) Vegetables for example cabbages and kales,

(iv) Fruits for example oranges, avocado and mangoes

(v) Tuber crops for examle yams, sweet potatoes and cassavas.

## Exercise 1

List two examples of each of the following categories of plants

(i) Cereals

(ii) Legumes

(iii) Vegetables

(iv) Fruits

(v) Root tubers

(vi) Stem tubers

## Cash crops

Examples of cash crops are coffee, Cocoa, sisal, cotton

**Annual crops**

Annual crops are crops that are harvested within one year

Examples of annual crops are bean, ground nuts, maize, wheat, cotton, cassava

## Perennial crops

Perennial crops are crops that are matured and harvested I more than one year.

Examples of perennial crops are coffee, tea, mangoes and avocados

## Exercise 2

Name two Perennial crops and two annual crops around your school

## Garden Tools and Their Uses

1. **Hoe** – Used for digging, weeding, and loosening soil.
2. **Rake** – Used for collecting leaves, leveling soil, and breaking clods.
3. **Wheelbarrow** – Used for carrying soil, manure, crops, or tools around the garden.
4. **Pegs** – Used for marking boundaries or supporting plants with strings.
5. **Shovel** – Used for digging, lifting, and moving soil or sand.
6. **Pick axe** – Used for breaking hard ground or rocks.
7. **Pot** – Used for planting flowers or seedlings.
8. **Hand fork** – Used for loosening soil in small areas and removing weeds.
9. **Panga (machete)** – Used for cutting grass, clearing bushes, or splitting stems.
10. **Watering can** – Used for watering plants gently.
11. **String** – Used for tying plants, marking rows, or supporting climbing crops.
12. **Garden fork** – Used for turning soil, mixing compost, or digging up root crops.
13. **Trowel** – Used for transplanting seedlings and small digging tasks.

14. **Secateurs (pruner)** – Used for cutting small branches, pruning flowers, or trimming shrubs.
15. **Axe** – Used for chopping wood or cutting large stems.
16. **Pail (bucket)** – Used for carrying water, manure, or harvested crops.
17. **Jerrican** – Used for storing and carrying water or liquid fertilizers.
18. **Sprayer** – Used for applying pesticides, herbicides, or liquid fertilizers.
19. **Knife** – Used for cutting fruits, vegetables, or trimming plants.

Examples of Garden tools


**Exercise 3**

Name any four garden tools and give a use of each

## Caring for plants

Plants are cared for through

### 1. Land preparation

This includes clearing land, digging, planting and fencing, watering and weeding

**(i) Clearing of the land**

A tool for clearing land include panga, slasher, hoe and axe to clear to remove grass, remains of previous crop, bush or trees.

Some people then burn the resulting trash but burning is not a good practice because some nutrients are lost.

Clearing also includes removing stones and other rocks from the piece of land.

**(ii) Digging or ploughing**

If the plot is small, human labour is used but if it is a big piece of land, an ox-plough or tractor can be used for ploughing.

uses of ploughing

(i) Preparing land for planting
(ii) Uprooting and killing weeds
(iii) Removing pest infected plants
(iv) Loosening soil for easy penetration of air and water

**2. Fencing:** A fence protects the plants for being eaten by animals or being stolen.

### 3. Selecting planting materials such as seed

Health or good planting materials are selected in order to get healthy crops. Involve picking those planting materials without sign of disease for planting

**Qualities of seeds that germinate**

(i) Good color
(ii) Good size
(iii) Higher physical soundness and weight.
(iv) Good genetic purity

## 4. Planting

Planting materials include:

(i) Seeds for example maize, beans, and rice

(ii) Stem cuttings for example, sugar cane; sweet potatoes and kales

(iii) Tubers for example Irish potato

(iv) Rhizomes for example grasses and ginger

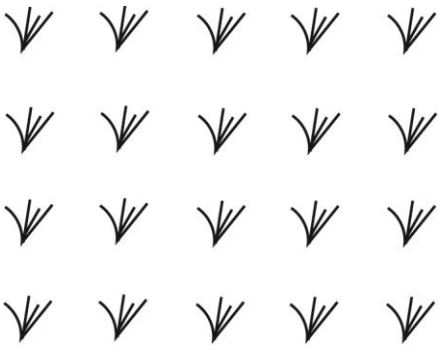
(v) Suckers for example banana and sisal

(vi) Splits for example pyrethrum.

### Methods of planting

**(a) Planting in row:** crops are planted in regular row and/or columns guided by string(s) to make straight lines

**Illustration**



**Advantages of planting in rows**

(i) Easy to weed

(ii) Easy to spray

(iii) Enable proper spacing

(iv) Avoid wastage of seed

(v) Makes harvesting easy

(vi) Allow use of machines

**Disadvantages of planting in rows**

(i) Labour intensive

(ii) Time consuming

(iii) It is tedious for small plants like millet, rice

Examples of plants planted in rows

Onion, cassava, maize, coffee and cotton

**(b) Broad casting :** seeds are scattered randomly

**Advantages**

- Saves time and labour

**Disadvantages**

Wastes seeds

Makes weeding, harvesting, spraying difficult

## 5. Gap filling

This is the planting of more crops in big gaps between crops after germination

Importance of gap filling

(i) To ensure proper crop density

(ii) Minimize land wastage

(iii) To increase yield per land size

## 6. Watering

Watering may be necessary during dry weather to enable crops grow well

## 7. Weeding

Weeding is the removal of unwanted plants from the garden

Example of weeds include


Disadvantages/ dangers of weeds

(i) They compete with plants for water, nutrients and light

(ii) Carry diseases or disease causing organisms

(iii) Increase the rate of spread of diseases

8. **Thinning** is the removal of excess or weak plants from the garden

**Importance of thinning**

**(i)** to avoid overcrowding of crops

**(ii)** To make weeding easy

**(iii)** Giving plants enough space

**(iv)** Removing competition of weeds and crops for light and water

9. **Pruning** is the removal of excess branches or leaves from a crop.

**Importance of pruning**

**(i)** to increases light penetration

**(ii)** It removes diseased or infected plant parts.

**(iii)** It controls spread of pests and diseases.

## 10. Mulching

**Mulching is the covering of land between crops dry plant materials such as grass, coffee husks and tree leaves.**

**Uses of mulching**

(i) It reduces evaporation and keep the soil moist

(ii) Mulching adds nutrients to the soil after decomposition

**Dangers of mulching**

**(i)** It may lead to spreading of disease and crop pests

**(ii)** It may hide dangerous animals like snakes

## 11. Harvesting

it is collecting ready crops from the garden

Methods of harvesting

(i) Uprooting for example cassava and ground nuts

(ii) Cutting for example sugar cane, millet, sorghum and bananas

(iii) Hand picking for example coffee, oranges, tea, avocado.

(iv) Digging for example Irish potatoes, sweet potatoes, yams

## 12. Drying

Drying is necessary for cereals and tubers to prolong theirs storage life

## 13. Storing

It is the keeping of harvested crops safely for future use.

**Importance of crop storage**

(i) To maintain planting materials for future planting

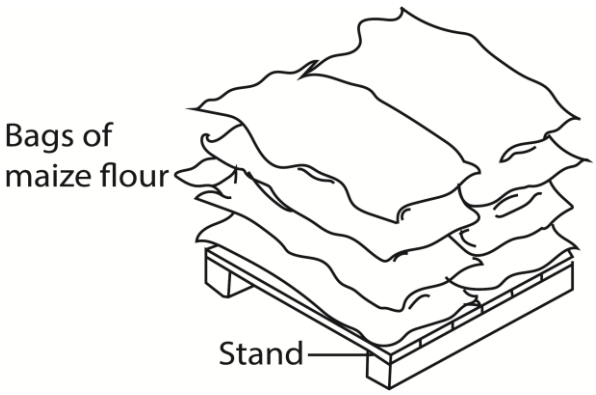
(ii) To wait for good market prices

(iii) To get what to eat in periods of scarcity

## Conditions for Proper Storage of Harvest

(i) **Cleanliness:** Store harvest in clean containers or stores to avoid contamination by dirt, pests, or diseases.
(ii) Dryness: Crops should be well dried before storage to prevent rotting and mold growth.
(iii) Perishable crops require special storage conditions such as refrigeration
(iv) **Cool temperature:** A cool environment slows down spoilage and insect activity.

(v) **Ventilation:** Stores should allow free air circulation to keep produce fresh and reduce moisture buildup.
(vi) **Protection from pests:** Use sealed containers, pesticides, or natural repellents to keep away rats, insects, and birds.
(vii) **Proper packaging:** Use bags, bins, or silos that are strong and suitable for the type of crop.
(viii) **Avoid direct sunlight**: Sunlight can cause heating and spoilage, so storage areas should be shaded.
(ix) **Regular inspection:** Check the harvest often for signs of damage, pests, or spoilage.
(x) **Separation:** Keep different crops apart to avoid cross-contamination or mixing.
(xi) **Safe chemicals:** If preservatives or fumigants are used, they must be safe and applied correctly.
(xii) Crops should be stored off the floor to prevent entry of water and pests




**Exercise 4**

(a) Give one benefit each of the following practices to the plant
  (i) Fencing
  (ii) Watering
  (iii) Thinning
  (iv) Weeding
(b) State two qualities of seeds for planting
(c) State **two** importance and **two** storage condition of harvested crops

**14. Record keeping**

Importance of keeping record

(i) To determine profitability of agriculture

(ii) To prevent theft.

(iii) To help in planning and budgeting

**Types of record kept**

(i) Cost of seeds

(ii) Costs of labor

(iii) harvests

(iv) Sales

(v) Inventory of garden tools

## Crop rotation

It is the growing of different crops on the same land in different seasons.

## Importance of crop rotation

(i) Maintains soil fertility because some crops like legumes add nutrients (nitrogen) to the soil while others like maize remove nutrients from the soil

(ii) Control pests by breaking their life cycles

(iii) Improves crop yield

## Exercise 5

(a) List any two records kept on a crop farm

(b) Give two importance of crop rotation

## Pests and diseases

Signs of plant infected by pest and diseases

**(i)** **Holes in Leaves, stems, roots, fruits**

**(ii)** **curled** leaves

**(iii)** **leaves, fruits, stems change color, usually turn yellowish**

**(iv)** **the plant wilts or droops**

**(v)** poor plant growth.

**(vi)** Spots on leaves, stems and roots

**(vii)** Rotten parts of the plant

## Pests

These are destructive insects or other animal that attacks crops

**(i) Exampled Field pests or pests that destroy plants in the field**

Weaver bird

Maize stalk borer

Cut worm

Aphids

**(i) Storage pests**

Storage pests are the pests that attack the harvested crops when in storage. Examples of storage pests are weevil, termites and rodents


## Effects of pests on crops

Pests affect crops in the following ways:

(i) **They eat and reduce harvest** by competing with crops for nutrients

(ii) Reduced quality of produce.

(iii) Pests that suck plant juices like aphids transmit diseases from unhealthy plants to healthy plants.

### Controlling pests

To eliminate or reduce wastage of crops and improve harvest, pests must be controlled. The methods of controlling pests include:

**(i) Trapping**: This method can be applied for rodents and birds in food storage sheds.
**(ii) Handpicking**: Insects like weevils can be removed by hand.
**(iii) Scaring: using noise or scare crow**
**(iv) Weeding or removing infected weed**
**(v) Spraying using insecticide to kill pest**
**(vi) Pruning : removing unhealthy branches and leaves**

### Exercise 6

(a) State two signs of a plant infected plants infected by pests and disease
(b) Two ways of controlling pests an controlling pests and diseases

## Crop diseases

### Effects of crop diseases

**The effects of diseases on crops may be**:

- Less or reduced yield of harvest
- The quality of the produce is lower or poorer
- Lower quality of crop produce may lower the market value of the crop and reduce the farmer's income
- The crop may die.

### Control of crop diseases

**(i)** Spraying with insecticide

**(ii)** Removing, burning or burying infect plants

**(iii)** Weeding

**(iv)** Early planting

**(v)** Crop rotation to break disease cycle

**(vi)** Planting health seed

**(vii)** Planting resistant crops

**Nursery bed**

A nursery bed is a small garden where small seed are germinated before seedlings are transplanted to the main garden
Examples of crops grown in a nursery bed are cabbage, carrot, onions, coffee,

**Importance of nursery bed**

(i) Protects delicate seedling from harsh weather such as heavy rain fall and strong sunshine.
(ii) Ease caring for seedlings

(iii) Enable seeds to germinate in favorable soil conditions
(iv) Enable farmer to select healthy seedlings for planting

Activities done on a nursery bed

(i) Watering
(ii) Protecting the seedlings from excess heat and light
(iii) Weeding to remove unwanted plants
(iv) Spraying to kill pests and diseases
(v) Thinning or removal of weak or infected seedlings
(vi) Transplanting or transferring mature seedlings to the main garden

## Exercise 6

(a) Give two importance of nursery bed

(b) List two activities of done on a nursery bed

## Revision questions

1. State any **one** reason why pruning of trees is important in agroforestry.

    - **Allow light penetration to the plants**
    - **Removes diseased branches**
    - **Improves air circulation reducing fungal infections**
    - **Enhances flowers and fruit production**
    - **Removes dangerous branches**

2. What is the importance of gap filling in crop growing?

    **To maintain optimum plant population.**

3. State any **one** sign of disease on the plant leaves.

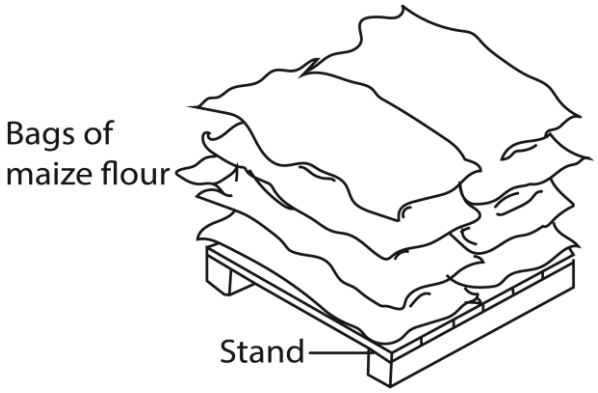
    - **Chlorosis (yellowing of leaves)**
    - **Leaf rust (common in corn)**
    - **Leaf spot (septoria brown spot)**
    - **Leaf wilt**
    - **Leaf death**

4. Which method of harvesting trees allows new shoots to grow for the stump?

    - **Coppicing**

5. The diagram below shows bags of maize flour in a store.

    Use it to answer the question that follows.




Why are the bags of maize flour put on such a raised stand?

**To prevent moisture damage to the bags**
**To control pests**
**To allow easy cleaning**

**To improve air circulation**

6. Give any one advantage of pruning tress.

   - eases weeding

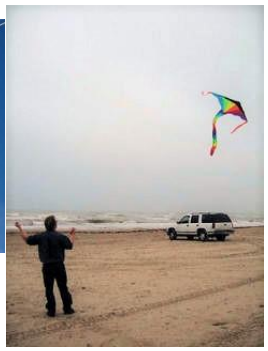
   - reduce competition for light

   - Reduces spread of diseases

   - for better yield

7. Apart from running windmills, give one other way wind is used as an energy resource.

   For drying clothes, flying kites for winnowing


8. Write down any two ways farmers can control pests in the garden without using chemicals
   (i) use biological enemies of the pest.
   (ii) by burning infected crops
   (iii) by crop rotation
   (iv) by timely weeding
9. What is the best natural conditions under which cereals like maize can be stored?
   **Dry and cool conditions,**
10. Give the main reason why crop rotation maintains fertility.
   **When legumes are included they fix nitrogen in the soil.**
   **Crop rotation prevents exhaustion of a single nutrient.**
11. How is a vector different from a pest?
   **Vectors spread diseases while pests destroy crops**
12. . What is the disadvantage of having anthills near gardens?

   **Contain termites that destroy crops**

13. Give any one reason why it is important to weed crops.

   **Remove competition of weeds with crop**

**To increase penetration of light**

**To reduce spread of diseases**

14. In which way is crop rotation a good method of controlling crop pest?

**Changing crops breaks the feeding cycle of a pest reducing the number of pests**

15. Mention any one reason for thinning crops like cotton.

**For easy weeding**

**Giving plants enough space**

**Reducing competition for light**

16. Give one disadvantage of using herbicides (chemicals) to kill weeds in crop gardens.

**May kill crops, may make the products poisonous**

17. What name is given to a place where seedlings are grown before transplanting?

Nursery bed

18. Give any one advantage of pruning tress.

- eases weeding
- reduce competition for light
- Reduces spread of diseases
- for better yield

19. Name the root crop which is attacked by the mosaic disease.

Cassava

20. State any one sign of disease on plant leaves

**Wilting**

**Curling**

**Change colour from green**

21. Which method of harvesting trees allows shoot to grow from stump?

**Coppicing**

22. How are plants important in a food chain?

**Produce food**

23. (a) Give any two qualities of seeds that can germinate

**Physical not damaged**

**Healthy**

**Big size**

(b) State any two farm practices which help in controlling insect pests in a garden

**crop rotation**

**scaring pests with scare crow**

**trapping**

24. (a) A farmer who practices mixed cropping has the following crops to plant: beans, cassava, ground nuts and potatoes.

(i) Which two crops would be advisable for the farmer to plant together?

**Beans and potatoes**

(ii) Give a reason for your answer in (i) above

**Bean root nodules contain bacteria that fix nitrogen for the potatoes.**

(iii) The farmer uses a garden for planting maize crop only for three consecutive years (planting season). During the harvest in the third year, he noticed a drop in maize yield. Suggest a reason why the yield dropped.

**The nutrients were used up**

**The pests had accumulated**

(iv) How can the farmer improve his maize yield in the same garden without using fertilizers?

**Adding manure**

**Practice mixed cropping with legumes**

25. Nakato harvested her maize crop and dried it. She put the maize in a sack and stored it on the floor, in the corner of the bed room. Akello also harvested and dried her maize crop. Then she hung the maize cob above the fireplace in the kitchen.
    (a) Explain why Akello would have better maize grains to plant next season
        **Akello's maize is well dried and disinfected by smoke.**
    (b) Give two ways in which Nakato can improve on the storage method.
        **Spread the maize grain to dry**
        **Keep the maize off the floor**
26. (a) How does a banana plant multiply?
    **By suckers**
    (b) What insect pest attacks banana
        **Banana weevil**
    (c) In which part of the plant would you find this pest?
        **Stem**
    (d) State the method you would use to control the insect pest.

        **Use insecticide to kill the pest.**

        **By destroying infected plant**
27. The table below shows crops pests and the crop they destroy. Complete the table by filling in the blank spaces.

| Pest | Crop |
|---|---|
| **(a) Rabbit or caterpillar** | Potato leaves |
| (b) Birds | **Millet, sorghum, rice, wheat** |
| **(c) Caterpillars** | Orange leaves |
| (d) Aphids | **Beans, fruit** |

28. (a) Name three activities performed when preparing a school garden
        **Clearing bush, Digging, Sowing, Pruning, Spraying, watering**
    (b) Why is a school garden fenced
        **The prevent pests like cow, goats**
        **To prevent thieves.**
29. What is the importance of a nursery bed to a vegetable farmer?
    **Help a farmer to care for the seedlings**
    **A nursery bed protects the seedlings from direct damaging rain and sunlight.**
    **A farmer can choose healthy seedling from the nursery bed to plant in the main garden**
30. A mill bug is a common crop pest.

(a) Name any two vegetable crops it affects

**Cabbage, eggplant, tomatoes, cauliflower**

(b) What can be done to prevent it from attacking the crops you have named in (a) above?

**By crop rotation**

**By spraying with insecticide**

(c) What natural method controls mill bug pests in a garden?

**by its predator**

31. . The diagrams below are of pests. Use them to answer questions (a) and (b) below

A

B

(a) Name the pests:

(i) A: **bean weevil**

(ii) B: **beetle**

(b) What is the disadvantage of the above insects to a farmer?

**They destroy crops reducing yield.**

**Increase cost of production due to buying pesticide.**

32. (a) What is a crop pest?

**It is a living organism that destroys crops**

(b) Give any one example of a crop pest.

**Bean weevils, Cotton stain burg, Rats, squeal, termite, and grasshoppers**

(c) Apart from spraying with chemical, give other two ways of controlling crop pests.

**(i) Use other living things that eat or damage pests**

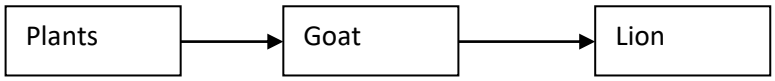
**(ii) Crop rotation to break the pest's life cycles**

**(iii) Use of scarecrow**

**(iv) Burning infected plants**

**(v) Planting resistant crops**

33. The diagram below is of a food chain. Study it and answer the questions that follow.




(a) Name the producer

**Plant**

(b) Which living organism in the diagram is herbivorous?

**Goat**

(c) Why is the organism in (b) above herbivorous?

**Feeds on plants**

(d) Name one way in which plants benefit from the goats.

**Carbon dioxide for photosynthesis**

**Manure**

34. (a) Mention any one method of harvesting root crops

**Uprooting, cutting, picking**

(b) Give any three ways in which weeding helps on the proper growth of root crops.

**(i) reduce competition of crops for nutrients with weed**

**(ii) to ensure the root crop get enough sunlight**

**(iii) to ensure that root crops have enough space**

35. (a) State one way in which a nursery bed is important to a farmer.

**It protects seedlings from harsh weather conditions like too much rainfall and sunshine**

**It enables easy monitoring of seedlings**

**Enable a farmer to know which seedling are ready for transplanting**

(b) Name two vegetable crop commonly grown in a nursery bed

**(i) vegetable**

**(ii) carrots**

**(iii) tomatoes**

**(iv) tomatoes**

(c) Give one way in which a farmer can care for crops in nursery bed.

**weeding**

**watering**

**sheltering**

36. (a) Apart from the lack of conditions necessary for germination, give any two other factors that can make a seed fail to germinate.

**(i) immaturity of embryo**

**(ii) hard impervious cuticle**

**(iii) loss of viability**

(a) Write down any two ways farmers can control pests in the garden without using chemicals

**(i) use biological enemies of the pest.**

**(ii) by burning infected crops**

**(iii) by crop rotation**

**(iv) by timely weeding**

(b) Give one way in which plants benefit from animals for photosynthesis.

**Get carbon dioxide**

37. (a) Name the group of crops that are harvested year after.

**Perennial crops**

(b) Give any two example of crops that belong to the group you have named in (a) above

**Coffee, tea, mangoes, orange, Banana, sisal, coconut, pyrethrum, oil nut, paws**

(c) State one way in which the above crops are harvested.

**(i) By hand picking e.g. cotton**

**(ii) Plucking e.g. maize**

**(iii) Uprooting e.g. beans**

**(iv) Cutting e.g. sugar cane**

**(v) Digging e.g. cassava and Irish potatoes**

38. (a) What name is given to a practice of growing crops and trees together on the same piece of land?

**Agroforestry**

(b) State any two ways in which crops benefit from trees when they grow together.

(i) **Trees provide shades**

(ii) **trees act as weed breaker**

(iii) **leaves from trees form manure**

(iv) **Trees provide support to climbing crops**

(c) Give any one proper method of harvesting trees in the practice named in (a) above

**Pollarding/ cropping/selective felling**

39. (a) give two examples of natural fertilizers

**(i) Green fertilizer**

**(ii) Composite fertilizers**

(b) State any two ways in which natural fertilizers are better than artificial fertilizers.

**(i) They stay longer in the soil**

**(ii) they are cheap**

**(iii) Do not require skill to apply**

**(iv) Improve soil texture**

40. In the table below, part A shows some activities carried out by farmers and part B shows the effects of activities

| A<br>ACTIVITIES | B<br>EFFECTS |
|---|---|
| Irrigation<br>Afforestation<br>Mulching<br>Crop rotation | - Preservation of soil moisture<br>- Leads to death of crop pests<br>- Promotes convectional rain fall<br>- Allow growth of crops in all seasons |

Write the correct effect to the activity in the space provided below

Irrigation: **allows growth of crops in all seasons**

Afforestation: **promotes convectional rainfall**

Mulching: **preserves soil moisture**

Crop rotation: **leads to death of crop pest**

41. (a) Use the living things below to complete the given food chain

Lion. Goat, grass

**grass** → Goat → **lion**

(b) Which one of the living things in the chain is a producer

**Plant**

(c) What is the source of energy for the producer in the food chain above>

**Sunlight**

42. (a) Apart from planting crops in rows, give another method of planting crops

**Scatter method**

(b) Give any **two** advantages of planting maize in rows

**(i) Easy weeding**

**(ii) Easy to irrigate**

**(iii) Easy to harvest**

**(iv) Easy for spraying**

**(v) Maximize use of space**

(c) State any **one** way in which the use of chemicals on a farm can be dangerous to a crop farmer

**May be poisonous to animals and people**

43. (a) Give any two qualities of seeds that germinate

(v) Good color
(vi) Good size
(vii) Higher physical soundness and weight.
(viii) Good genetic purity

(b) State any **two f a r m** practices which help in controlling insect pests in a garden

(i) Crop rotation
(ii) scaring pests with scare crow, sound
(iii) trapping
(iv) Burning/burring infected plants
(v) Weeding

44. (a) Name the group of crops that are harvested year after.

Perennial crops

(b) Give any two example of crops that belong to the group you have named in (a) above

(i) coffee, tea, mangoes, orange, Banana, sisal,

(ii) coconut, pyrethrum, oil nut, paws

(c) State one way in which the above crops are harvested.

(i) By hand picking
(ii) plucking
(iii) Uprooting
(iv) Cutting
(v) digging

45. (a) Apart from millets, wheat and sorghum, give any one other cereal food crop.

Oats, barley

(b) Mention any one common pest that that destroys cereals crops

Termites

birds

(c) Give any two reasons why cereal crops are dried before storing

(i) to prolong their storage life

(ii) to make them resistant to pests and diseases.

**Thank You**

**Dr. Bbosa Science**