



SCIENCE



Written by :
Ritu Jain

8

New Edition

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SCIENCE

Preface

Today's children will spend their adult lives in a multitasking, multifaceted, technology driven, diverse vibrant world, and thus they must arrive equipped to do so effectively.

This new edition of 'Science' has been completely prepared in accordance with National Curriculum framework. The most important aim of this series is to develop scientific attitude in children rather than providing information.

To fulfill our aim, the books are produced in large format, in full colour with attractive illustrations to enhance visual appeal. We hope that our attempt has been successful and a small step towards imparting necessary quality education to our children. Change is a way of life and our endeavour is to continue to evolve the series into a better product. Suggestions and comments are encouraged.

—Publisher





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Crop Production And Management

1

UNIT-1 : FOOD

IN THIS CHAPTER

- *Agricultural practices*
- *Protecting from weeds*
- *Crop production*
- *Storage*

INTRODUCTION

Food is the main source of energy and nutrition for all living organisms including human beings. We get food from plants and animals.

Growing plants and rearing animals for food, clothing or any other use is called agriculture.

AGRICULTURAL PRACTICES

When plants of the same kind are grown and cultivated at one place on a large scale, it is called a crop. We get different kinds of food products such as cereals, fruits and vegetables from crops. We also get pulses oil seeds, sunflower, groundnut, tea, coffee etc. from plants.

Cereals are nutritious seeds of crops that are mainly rich in starch and fibre. Some of them are also good sources of proteins, vitamins and minerals. Such as wheat, rice, maize, bazra, jawar, gram etc.

Fruits protect us against diseases. Fruit is also seed-bearing ripened ovary of a flowering plant. Such as apple, mango, cherry, banana, orange, pineapple etc.

We eat different parts of a plant as a vegetable such as a root of onion, carrot etc. Stem of potato, sugarcane, leaf of spinach lettuce and flower part of a cauliflower and broccoli.

Climatic conditions like temperature, rain fall and humidity vary from one region to another region in India.

The two main types of crops grown in India are the kharif and rabi crops.

Kharif Crops

Kharif crops are sown in the rainy season. Generally rainy season starts from June and continue till September. Such crops depend on monsoon rains for growth. Rice, maize, soyabean, groundnut, cotton etc. are the kharif crops.



Kharif crop

Rabi Crops

Rabi crops are grown in the winter season. Generally in the month of November and harvested in the month of April. Such crops do not depend on monsoon rains. Wheat, barley, peas, gram, mustard and linseed are rabi crops.

Besides these pulses and vegetables are grown during summer at many places.



Rabi crop

CROP PRODUCTION

Cultivation of crops involves several activities undertaken by farmers over a period of time. These activities are called agricultural practices. These activities are given below :

1. Preparation of soil
2. Sowing of seeds
3. Adding manures and fertilizers
4. Irrigation
5. Protecting
6. Harvesting
7. Storage

Do You Know ?

The loose soil helps in the growth of earthworms. These organisms further turn and loosen the soil. Their burrowing action creates channels through which plant roots penetrate the soil more easily. For these reasons, earthworms are called farmers' friends.



Earthworm—a farmer's friend

Preparation of Soil

The preparation of soil is very important part of growing the plants. Plants absorb water nutrients and minerals from the soil. The first step in the preparation of soil involves loosening and turning it by the process of ploughing. Loose soil allows the roots to penetrate deep into the soil and roots to breathe easily when they go deep into the soil. The loosened soil helps in the growth of earthworms and microbes present in the soil. These micro-organism and earthworms are the friend of farmers because they help to loosen the soil and add humus to it.

Soil contains minerals, water, air and some other living organisms. These organisms decompose dead animals and plants and therefore various nutrients held in the dead organisms are released back into the soil.

Ploughing of soil is done by ploughs. Ploughs are made up of wood or iron. Somewhere land is very large than tractors are used for ploughing the field.

If the soil is very dry it may need watering before ploughing. The ploughed field may have big pieces of soil called crumbs. It is necessary to break these crumbs with a plank.

Then after, levelling of field it is ready for sowing seeds and watering. This is done with the help of wooden or iron leveller.



Preparation of soil

Sowing of Seeds

Selection of good quality seeds is important task in the cultivation. Good quality seeds can give only good crops therefore sowing is also important part of it. There is one method to separate good seeds from infected seeds. When we put seeds in a bucket of water and keep for some time infected seeds will float on the water surface.

Infected seeds become lighter and float and good seeds settle down at bottom.

Now separate infected seeds and collect good seeds.

There are mainly two methods of sowing the seeds-traditional method and seed drilling. The tool used traditionally for sowing seeds is shaped like a funnel. The seeds are filled into the funnel, passed down through two or three pipes having sharp ends. Their ends pierce into the soil and seeds are placed there.

Now-a-days the seed drill is used for sowing with the help of tractors. This drill sows the seeds uniformly at proper, distances and depths. It ensures that seeds get covered by the soil after sowing. Sowing by seed drill saves time and labour.



Sowing of seeds

Sowing of seeds

Seeds should be sown at appropriate distance from one another to allow to get sufficient sunlight, nutrients and water from the soil.

Adding Manures and Fertilizers

A fertile land is rich in the nutrients that are required for plant growth. When seeds are sown in a field, they absorb minerals and nutrients from the soil. Repetition of crops in the same soil depletes the necessary minerals and nutrients from the soil that are essential for growth of plants.

To replenish the minerals and nutrients to the soil, farmers add manures and fertilizers to it. Manure is an organic substance obtained from the decomposition of plant or animal wastes. Farmers dump plant and animal waste in pits at open places and allow it to decompose. The decomposition is caused by some micro-organisms. Vermi composting is a good manure. Manure is generally poor in nitrogen content and mineral such as phosphorus and potassium.

Fertilizers are chemical substances which are rich in a particular nutrient. These are manufactured in factories. The most common fertilizers are NPK (Nitrogen, phosphorus, potassium). Chemical fertilizers are easily soluble in water and easy to store and handle therefore are very popular with farmers.

Fertilizers help farmers to grow better crop. On the other hand, excess use of fertilizers to the crops may adversely affect the health of animals and human beings who eat these plants and their products. Crop rotation is another good method to replenish the nutrients and minerals of the soil. In crop rotation, farmers grow different crop in same field. They grow legumes as fodder in one season and wheat in the next season. They help in replenishment of the soil with nitrogen.



Adding manures and fertilizers

Watering of Plants

Water is very important for proper growth and development of plants and trees. Water is absorbed by roots of plants and water helps to transport the minerals and nutrients to various parts of the plant. Plant contains approximately 90% water. Water is also essential for germination of seeds. The supply of water to crops at different intervals is called irrigation. Even rainfall is one of the major natural source of water but it is not certain. That's why a regular supply of water is essential for growth of the plants.

Water requirement differs from crop to crop. Such as rice crops need a constant supply of water whereas wheat requires water at regular intervals during its growth.

The sources of irrigation are tube wells, rivers, animals, dams etc.

There are some traditional and some modern methods for irrigation.

Moat, chain system, rahat and dhekli are some traditional methods to irrigate the field.



Moat



Rahat



Dhekli

Tubewells, drip irrigation are the modern methods of irrigation. Pumps are commonly used for lifting underground water. Electricity, diesel, biogas, solar energy is used to run these pumps.

Drip irrigation is very good method of irrigation. In this system, water is not wasted, it directly goes to the roots of the plants through pipes. It is a boon in regions where there is very less water available.



Tubewell and drip irrigation

Protecting from Weeds

Sometimes undesirable plants start growing with the crop. These undesirable plants are called weeds. Weeds generally start growing at the irrigation stage. Sometimes seeds of weeds may get mixed up with desirable seeds while sowing.

The removal of weeds is called weeding. Weeding is necessary because weed absorb essential nutrients and water from soil which affect the proper growth of plants.



Protecting of weeds

Amarantus, wild oat, grass and chenopodium are the common weeds.

Weeds may be removed manually by either uprooting them or by cutting them with the help of a trowel and harrow. Manual weeding is time consuming method.

Therefore weedicides are used to control weeds. Chemicals are sprayed in the fields to kill the weeds. They do not damage the crops. The weedicides are diluted with water. If the chemicals are sprayed in excess they may enter the food chain.

Harvesting

The cutting of crop after manuring is called harvesting. The harvest period differs from crop to crop. Wheat is harvested during the period between, November and April. Rabi crops are harvested during the period between June and September.



Harvesting

Harvesting of cereal crop is done either manually with the help of a sickle or with the help of machine called harvester, attached to a tractor.

After harvesting, the grains have to be separated from the cut crop. The process of separating grains from the chaff is called threshing. Threshing can be done manually or with the help of a machine called thresher. A special kind of farm machine called combine is used for harvesting and threshing at the same time.



Thresher

Separation of grains from the chaff is also a necessary step. Chaff is the material consisting of seed covering and small pieces of stem or leaves that have been separated from the seeds. Separation of grains from the chaff can be carried out by the process of winnowing. In this process, the grain chaff mixture is gradually dropped on the ground from a height. The chaff is blown away by the wind being lighter and grain falls vertically.



Winnowing

Storage

Safe storage is also very important task. Since moisture encourages microbial growth and insects, rats also waste food grains. The fresh crop has more moisture. If freshly harvested grains are stored without drying, they may get spoilt or attacked by organisms, losing their germination capacity. Therefore, before storing them, they should be dried properly in the sunlight to reduce the moisture. This prevents the attack by insect, pests, bacteria and fungi. Farmers store grains in jute bags or metallic bins, pesticides should be sprayed in the godowns before storing bags of food grains and check time to time for infestation of any kind.



Storage

Know the Keywords :

Crop : When plants of the same kind are grown and cultivated at one place on a large scale.

Kharif crop : Crops are sown in the rainy season.

Rabi crops : Rabi crops are grown in the winter season.

Harvesting : The cutting of crops after manuring is called harvesting.

Point to Remember

- Rabi crops grown from November to April.
- Seeds are sown manually or with the help of a seed drill.
- Harvesting is the cutting of the mature crop manually or by machines.
- Separation of the grains from the chaff is called threshing.
- Proper storage of food grains is must because pests and micro organisms waste it.

EXERCISE TIME

A. Answer the following questions :

1. Why agricultural practices are necessary ?
2. What are kharif and rabi crops ? Give example of each.
3. How does a farmer prepare the soil before sowing seeds ?

4. How is loosening of soil important for plant growth ? How are earthworms helpful to farmers ?
5. What is weeding ?
6. What is threshing ? How it is done ?
7. Why do farmers dry food grains before storing in the godown ?
8. What is combine and what is it used for?

B. Match the following :

Column 'A'

1. Rabi crops
2. Kharif crops
3. Manure
4. Fertilizers

Column 'B'

- (i) Cow dung, plant waste
- (ii) Rice, Maize
- (iii) Wheat, grain, pea
- (iv) Urea and super phosphate

C. Fill in the blanks :

1. The first step before growing crops is _____ of the soil.
2. _____ are nutritious seeds of crops.
3. _____ requires water at constant rate.
4. Wheat is an example of _____ crops.
5. _____ is nitrogen rich fertilizer.
6. Organic weedicides are called _____.

D. Tick (✓) the correct option :

1. Which of the following is not a rabi crop ?
 (i) wheat (ii) soyabean (iii) rice
2. The process of beating out the grain from the crop is called :
 (i) winnowing (ii) threshing (iii) manuring
3. Which of the following is not the traditional method of irrigation ?
 (i) rahat (ii) drip irrigation (iii) chain system
4. Which of the following is used to scare away birds in fields ?
 (i) tree (ii) rifle (iii) scarecrow



Creative Work

- Visit a local farmer in your area and find out about the crops that he raises in his farm, the animals he rears and the methods he uses for growing crops and rearing animals.