Chapter 1

Agriculture Management

POINTS TO STUDY

1.1 Crops and its types
1.2 Agricultural practices
1.3 Main crops grown in Rajasthan
1.4 Crops and environment

1.1 Crops and its types

We have earlier studied that all the living organisms need food for their growth development and being alive. Plants can prepare their own food but animals cannot prepare their own food. Animals are dependent mainly on plants to for their food. To fulfill the food requirements of population 1.25 core people, regular production of crops, proper management, care and planned distribution is necessary.

India is a predominantly agricultural country. About 80% of the population resides in the villages here. Along with the geographical diversity, there is a lot of diversity in the eating habits also. Let us discuss on table 1.1 to obtain the information about various crops found in your area.

Table 1.1 General information about plant

S.N.	Plant Name	Location where these are grown generally	duration of obtaining the crop
1.	Mango	On the margins of field	Upto many years
2.	Plum	On the Margins and in between of fields at Fixed intervals	Fruits can be obtained every year
3.	Wheat	In a large field area	Production is once in a year in less duration
4.	Barley		
5.	Gram		
6.	Mustard		
7.	Maize		
8.	Cauliflower		
9.	Lady's finger		
10.	Carrot		

(Students try to understand and fill the table 1.1 with their experience and help of their parents and teachers)

On the basis of observations made in Table 1.1 we can say that the plants which are of less use in food are grown in comparatively less areas while those which are mainly used in food are grown in larger area.

On the basis of above information we can say that plants which are grown at definite intervals of time to fulfill the food requirements of humans and animals are called **Crop plants** and the plants which are grown in a definite season are collectively called **Crop**.

When only a single type of plants are grown in a huge area, then it is called crop.

Come, let us do

Complete the table 1.2 by writing the season of growing and the estimated time from sowing till cutting of the plants found in your nearby areas.

Table 1. 2 Name, Season and Time duration of crop plants.

Name of Crop Plant	Season when crop is obtained (Winter or summer or rainy)	Estimated time (in months) from sowing till cutting.
Wheat		
Barley		
Maize		
Gourd		
Jowar		
Bajra		
Moth		
Mustard		
Til		
Water Melon		

(Students try to understand and fill the table with their experience and help of their parents and teachers)

From table 1.2, We have know that some crops are grown in summer, some in winter and some in rainy season i.e. their growing seasons are different. Crops grown in different seasons have different life spans also come, let us categorize the crops of our area on the basis of season.

How many types of crops are there based on the season ?

Categories the crops grown in your field on the basis of season.

Types of Crops :

Crops are categorized mainly into 3 groups on the basis of season. These are as follows : -

1) Rabi Crops
2) Kharif Crops
3) Zaid Crops

- **Rabi Crops :** These are crops grown between October to February. Example - Wheat, Barley, Gram, Peans, Mustard etc.
- **Kharif Crops :** These are the crops grown between June to September. Example - Maize, groundnut, linseed, green gram, black gram etc.
- **Zaid Crops :** These are crops grown between March to June. Example : Musk melon, Water Melon, cucumber and other vegetables

We can classify the crops on the basis of their common use as follows :

Table 1.3, Classification of Crops on he basis of use.

S.N.	Crops of similar characters	Example	Use
1.	Cereal crops	Wheat, Barley, Howar, Maize, Bajra etc.	Chapati, Porridge
2.	Pulses	Arhar, Green Gram, Gram, Black gram	Pulses
3.	Oil yielding crops	Ground nut, Linseed, Flax seeds, Mustard, Soyabean, castor	Oil
4.	Spices	Chilly, coriander, Ajwain, Lumin seeds, Turmeric	Spices
5.	Fruits and vegetables	Mango, Ber, Malta, Lady's finger, Tinda, Gourd, Cauliflower, Sweet Lime	Fruits and Vegetables
6.	Other crops	Fodder and Medicines	Fodder and Medicines

Now we will study about the entire process starting before the sowing of crops till its cutting. You might have seen crops in the field. You mighty also have seen the farmers engaged in different agricultural practices like irrigation, weeding, harvesting etc.

All the processes involved right from the preparation of soil, before sowing, upto the sale of the harvest market are called practices of crop productions.

Let us Study about these various practices of crop production.

1.2 Agricultural practices

To ensure a good crop yield several activities are undertaken by farmers from sowing till cutting.

All these activities done by the farmers for crop production are called agricultural practices.

Have you ever wondered what all practices are undertaken by the farmer. To produce crop ? Think and answer -

Following are the steps of agriculture :

1. Ploughing
2. Sowing of seeds
3. Providing manure or fertilizers
4. Irrigation
5. Crop protection
6. Harvesting
7. Threshing
8. Storage

1. Ploughing :

You might have visited your nearby fields. You might have seen that sometimes the fields are empty and at other times, there are crops before sowing of seeds, what all activities are carried out in the field ? Let us have a look.

First of all farmer ploughs the field. What sources of ploughing have you seen ?

The field can be ploughed by different modes like -

(1) By animals (Traditional method)

(2) By tractor

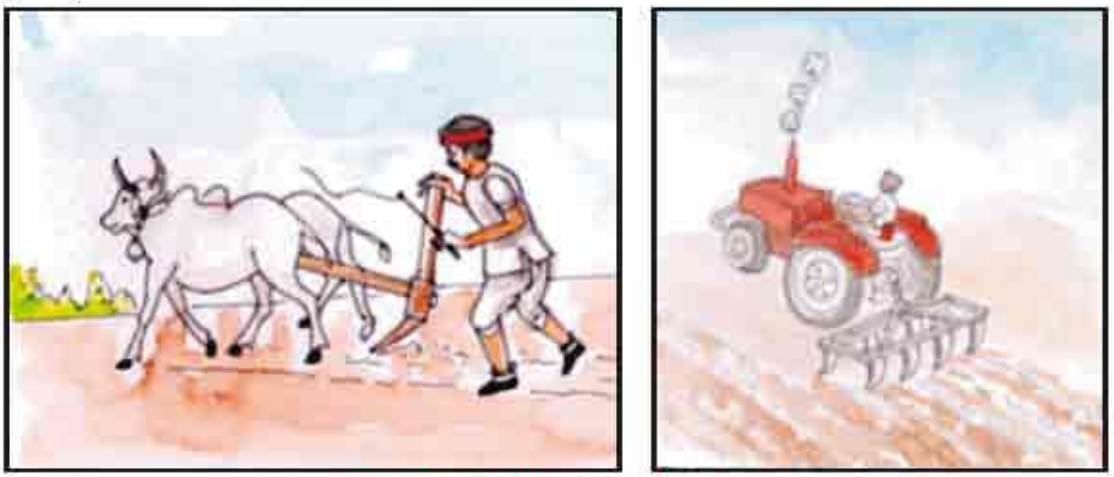

Fig 1.1 Modes of ploughing

Why the field is ploughed before sowing ?

First of all soil is prepared for growing crop by the farmer By ploughing he loosens and turns the soil. Loose soil has following benefits :

- Seed reaches below the uppermost layer which makes it's germination easy.
- Roots can penetrate deeper into the soil.
- Roots of new plants can respire easily.
- Loosened soil is helpful for the growth of microorganisms, earthworms living in the soil.
- The upper layer is the helpful for plant growth upto certain depth, by turning it up and down it gets evenly distributed.

To turn the soil up and down and loosen it by use of plough is called ploughing.

Tools of agriculture

A farmer uses various types of agricultural implements like- plough, hoe, cultivator etc.

2. Sowing

After preparing the soil , the farmer sows the seeds of the crop being grown. Before this he selects the best quality of seeds to ensure healthy crop and maximum grain production. Let us do an activity for selection of healthy seeds -

Fig 1.2 Plough

Fig 1.3 hoe

Fig 1.4 Cultivator

Activity 1

Take a bucket filled with water. Put some green gram seeds in it. Leave then untouched for some time and then observe. What do you observe ? Some of the grains settle down while others float on the surface. Why do some grains float on the surface ? Those which are floating on the surface are damaged and hollow. Thus being lighter, they float while healthy seeds are not hollow and get settle down at the bottom of the bucket. This way farmers identify healthy grains and sort them.

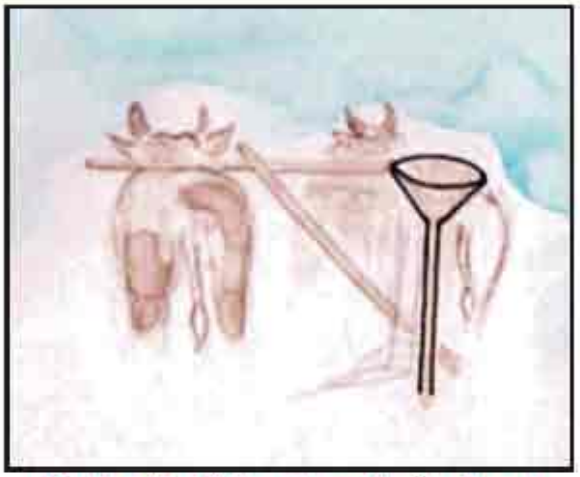

Fig 1.5 Traditional method of seed Sowing

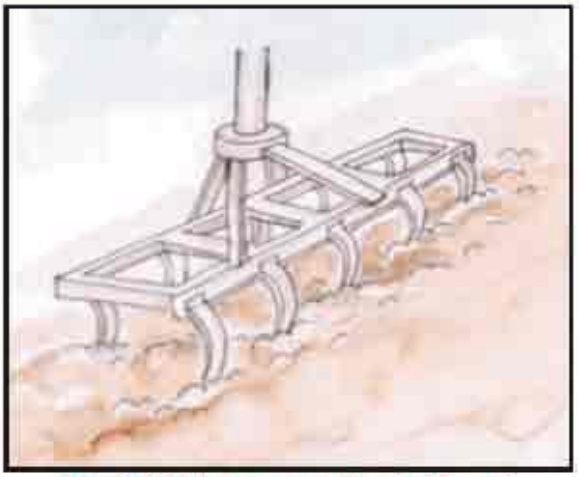

Fig 1.6 Modern method of seed sowing- seed drill

3. Providing manure and fertilizers

You might have seen farmers adding manure to the fields. Why do they add manure ?

To maintain the nutrition level of soils or to maintain the fertility of soil, some substances are added to the soil, these are called manure and fertilizers.

Differences between manure and fertilizers.

We have studied two types of substances to increase the soil fertility i.e. manure and fertilizers. You might have seen these being added to the soil. Both increases the fertility. Then why they are named differently? What is the differences between them ?

Come let us know -

Manure is natural and biotic while fertilizers are synthetic. Natural manure is made in the fields like Gobar (Compost) and vermi compost etc. while fertilizers are made in the factories like urea, ammonium sulphates, super phosphate, potash etc.

Manure is better than fertilizers because natural manure contains more of humus and it increases the fertility of soil where as fertilizers lack humus. Thus bio manure should be used more.

Benefits of Bio Manure :

1) This manure is more capable to reorganize the soil.
2) Useful bacterial growth speeds up in this manure.
3) It keeps the soil loosened which makes the root respiration easy.
4) Bio manure increases the water holding capacity of the soil.

4. Irrigation

What is next activity done by the farmer after growing the crop and adding manure to it? The farmer gives water to the crop. We require water alongwith the food. In the same manner plants also require water for growth and development.

Irrigation is the process by which the water requirement of plant is fulfilled by time to time using various artificial means :

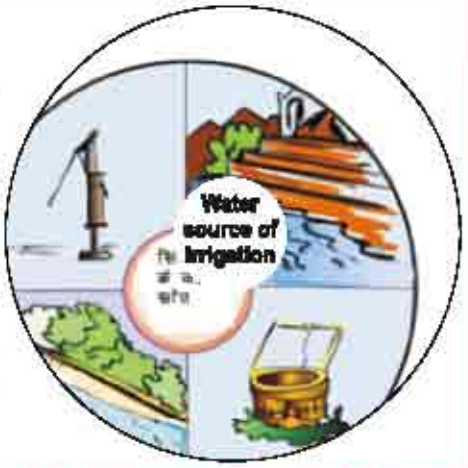

Fig 1.7 Water sources of irrigation

Benefits to the crop by Irrigation

1. For seed germination
2. To supply water to the leaves for transpiration
3. Through water nutrients reaches to various parts of plants.
4. It has an important role in growth and development of plant.

Sources of water for irrigation :

Farmers use water sources like rivers, pencils, wells, hand pump, canals for irrigation (fig 1.7).

Sources of Irrigation

Farmers uses various sources of irrigation to meet the requirement of crops. What are these sources.

Let us find out -

We uses various sources of irrigation which we can understand Fig. 1.8

Sources of Irrigation

1.Traditional sources

Chadas (Chain Pump)

2. Modern sources

Tubewell


Dhekli


Electric Pump


Rahat


Moat


Diesel Pump

Fig 1.8 sources of irrigation

We have seen various sources of irrigation in Fig. 1.8. Tell us how are they used for irrigation. Nowadays irrigation is done with tube well, diesel or electricity pumps, why is this so ? Modern sources take less time to irrigate more in comparision to the traditional sources. Water can be used wisely with these sources. Modern techniques of irrigation can be explained by following techniques.

Modern techniques of Irrigation

1. Sprinkler system (sprinkle from above)

2 .Drip System (Drop by drop irrigation in the roots)

Fig 1.9 Modern methods of irrigation

5. Protection of crops :

It is believed that when a farmer brings the harvested crop to his home, then his hard work reward as a success. But this is also not an easy process. During

this period also he has to face many problems. What could be these problems ? List all such problems.

Table 1.4 Description of problem faced by a farmer during cultivation

S.No.	Problems during the process of cultivation
1.	Weeds
2.	
3.	
4.	
5.	

Above problems result in low yield of crop which causes financial loss to the farmers. Let us understand the problems their adverse effects and preventive measures during crop cultivation.

Table 1.5 Problems in agriculture, adverse effect, preventive measures

Sr No.	Problem	Identification of problem	Adverse effect on crops	Preventive Measures
1.	Weeds	Unwanted plants that grow along with the crops and prevents the necessary nutrients from reaching the crop plants.	Crops do not get sufficient nutrients and proper sunlight.	Tilling from time to time. Use weedicides.
2.	Natural disaster	Flood, drought, cold, fire	Flooding in field, draining away of soil and manure, drying of crop or burning of crop.	Preparing proper water exit. Irrigation during drought. Preparation for prevention from fire.
3.	Diseases caused by insects, fungus, bacteria and virus	Deformity in leaves, Drying of stem, damage of fruits, low yield.	Damage in leaf, stem, fruit.	Spraying of insecticides, bacteriocides and fungicides.
4.	Animals	Harms the crops	Damage of crops	Fencing, preventive measures.

6. Harvesting

You might have seen crop being harvested in fields. When are the crops harvested?

After the ripening of crop, farmer cuts it, it is called harvesting.

When the crop ripes, it is either taken out from the roots or are cut from near the root. In early times sickle was used. Now a days also it is used at some places, but mostly the ripes farmers use harvesting machines for cutting the crops.

Harvesting by sickle

Harvesting by harvester machines

Fig: 1.10 Harvesting

7. Threshing

After harvesting, the crop is dried to remove any moisture. Then its grains are separated out from the chaff by the process of threshing.

- Farmers of small fields throws mixture in the air so that the wind blows away the lighter chaff while the heavier grains fall down.
- Farmers of large field do this work by combine machine or thresher which is a faster.

Threshing by hand

Threshing by combine machine

Fig 1.11 Sources of threshing

8. Storage

After threshing the farmer brings the grains, filled in the bags, at home and collects the chaff for fodder. He stores the food he had brought. He keeps the grains of required quantity at home, and rest he sales in the market. The protection of grains at home is also important. By various methods stored grains are protected from moisture, insects, mice and microbes. Large scale storage of grains is done in store houses called silos.

1.3 Important crops grown in different districts of Rajasthan

Table 1.6

S.N.	Crops	Main district of production
1.	Bajra	Alwar, Jaipur, Nagaur, Jodhpur, Sikar, Barmer
2.	Maize	Chittorgharh, Udaipur, Bhilwara, Banswara, Rajsamand
3.	Jowar	Ajmer, Pali, Tonk, Bharatpur, Alwar
4.	Rice	Hanumangarh, Bundi, Kota, Pratapgarh, Banswara
5.	Wheat	Shri Ganganagar, Hanumangarh, Alwar, Bharatpur, Bundi
6.	Barley	Jaipur, Hanumangarh, Sri Ganganagar, Alwar
7.	Moth	Churu, Bikaner, Nagaur, Jodhpur
8.	Gram	Hanumangarh, Sri Ganganagar, Bikaner, Jhunjhunu
9.	Green gram	Nagaur, Jodhpur, Jalore, Jaipur, Barmer
10.	Chawla	Jhunjhunu, Sikar, Nagaur
11.	Arhar	Udaipur, Tonk, Jaipur
12.	Groundnuts	Bikaner, Sikar, Churu, Jaipur
13.	Musturd	Sri Ganganagar, Alwar, Jaipur
14.	Tarameera	Sri Ganganagar, Jalor, Pali, Jaipur
15.	Soyabeen	Jhalawar, Chittor, Baran
16.	Cotton	Hanumangarh, Kota, Bundi, Sri Ganganagar
17.	Cumin	Jalore, Jodhpur, Barmer
18.	Coriander	Baran, Jhalawar, Kota

Table 1.7 Main fruits and vegetables producing areas in Rajasthan

S.N.	Fruits	Area
1.	Orange	Jhalawar
2.	Lemon	Dhaulpur
3.	Guava	Sawaimadhopur
4.	Peas or tomato	Jaipur
5.	Ber	Jaipur
6.	Amla	Jaipur
7.	Watermelon	Tonk
8.	Chilly	Sawai Madhopur
9.	Ginger	Udaipur
10.	Garlic	Kota
11.	Malta	Sri Ganganagar
12.	Grapes	Sri Ganganagar
13.	Cucumber	Bikaner
14.	Muskmelon	Pali
15.	Mango	Chittorgarh
16.	Fennel	Sirohi
17.	Carom Seed	Chittorgarh
18.	Onion	Jodhpur
19.	Banana	Banswara
20.	Sweet lime	Sri Ganganagar

1.4 Crops and Environment

We know that the environment surrounding us should be clean. For this we should keep ourselves and our surroundings clean. Along with this there should be greenery in our surrounding. Crops are green and throughout the year round one or the other crop is always there in the fields. Atmosphere also gets cleaned with the greenery. Thus crops directly effect the environment in the following ways:

1. Environment gets cleaned with crops.
2. Crops maintain the humidity in atmosphere.

3. They are helpful in controlling and regulating the amount of oxygen-carbon dioxide.
4. They regulate the temperature of the surroundings.
5. They protects the upper fertile layer of the soil from storms, winds and floods.
6. Lowers the air and noise pollution.
7. They provide life and protection to the animals.

Professor M.S. Swaminathan:

He was born on 7 August , 1925 at Kummkonam, Tamilnadu. Specialist in genetics, he is famous for his contribution in the field of green revolution. In 1966 , he hybridized seeds from Mexico with the home variety of Punjab and developed the hybrid variety which was high yielding variety. During the Green revolution, high yielding wheat and rice Seeds were sown in the fields. This revolution made India self dependent in the field of food grains. In the field of science and engineering M.S. Swaminathan was awarded with Padamshree in 1967, Padam Bhushan in 1972 and Padam Vibhushan in 1989.

What have you learnt

- When a single type of plants is grown in a large area, is called crop.
- On the basis of seasons crops are of three types: 1. Rabi 2. Kharif 3. Zaid
- There are various practices of agriculture : preparation of soil, sowing of seeds, adding manure and fertilizers, irrigation, protection of crops, harvesting, threshing, storage etc.
- Weeds- the unwanted plants that grow along with the crop, which do not allow the nutrients in the soil to reach the crop plants are called weeds.

EXERCISES

Choose the correct option:

1. Wheat is a crop of -
   (a) Rabi (b) kharif
   (c) Zaid (d) all of the above
2. Modern technique of irrigation is -
   (a) Charas (b) Dhekli
   (c) Electric pump (d) Rahat

Fill in the blanks:

1. The process of loosening the soil by use of a plough is called .....
2. Healthy seeds are ..... in weight and unhealthy seeds are .....
3. Sowing of only one type of soil continously lowers the ..... of soil.
4. On the basis of season crops are mainly of ..... types.

Short answer question:

(a) What is a crop?
(b) Give two examples each of Rabi, Kharif, and Zaid crops.
(c) What is threshing?
(d) What are the sources of irrigation?

Long answer questions

1. What are the modern techniques of irrigation ? Describe them.
2. What problems does a farmer faces while cultivation? What methods would you suggest to overcome those problems?

Activity work

1. Collect the samples of nitrogen containing chemical fertilizers used in the agriculture in your near by areas and paste them in scarp book. Also find out that for which crops are these used.
2. Plant trees in your school. Add different chemical fertilizers in them and observe them.
3. Contact with the farmers of your near by areas and what all activities the carry out for crop production.
4. Collect the information about cold stores and write down its importance.

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