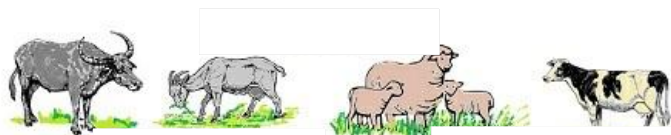


Class 8 Biology Crop Production and Management

Introduction

Introduction

Vast fields in villages are used for agricultural purposes. Agriculture is the practice of farming. It includes cultivation of crops and rearing of animals.



In this lesson, we are going to focus on crop cultivation which in turn provides food for the survival of the entire population. We will learn in detail about food production, storage & distribution.

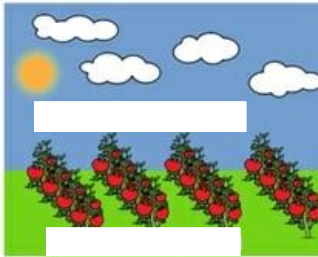


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Crop

Crop

Crop is a plant that is grown on a large scale commercially.



Pulses, Cereals, Oil seeds, Vegetables & fruits are different types of crop.



Different crops need different climate for growth & productivity. For example, Some crops like Maize, soya bean, sugarcane need more water whereas rice, potato need less water.

There are 2 cropping patterns based on India's climatic conditions:

- Kharif crops

Crops grown in rainy season are termed as Kharif crops. Examples: Maize, soyabean, sugarcane



- Rabi crops

Crops grown in winter season are termed as Kharif crops. Examples: Wheat, Gram, Pea



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Agricultural practices

Agricultural practices



Farmers take this huge responsibility of cultivation of crops to provide food to the entire population.

Various tasks performed by farmers for crop production are termed as Agricultural practices. Following activities form a part of Agricultural practices:

- Preparation of soil
- Sowing
- Adding manure and fertilizers
- Irrigation
- Protecting from weeds
- Harvesting
- Storage

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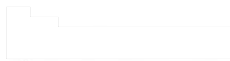
Preparation of soil

Preparation of soil

Preparing the soil so that it can support the crop cultivation is the first step towards Agriculture. The way you need to prepare before exams, similarly soil needs to be prepared before planting crops. The activities which prepare soil include Ploughing, Watering & Levelling.

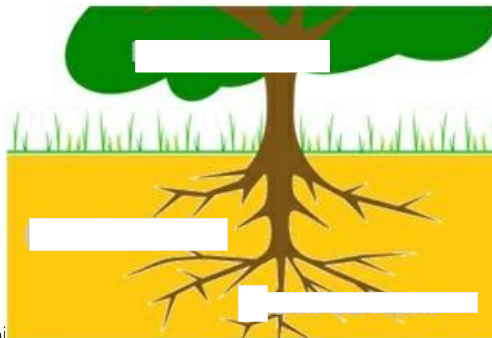


Ploughing



Ploughing is loosening & turning of soil. It is also termed as 'Tilling'. Ploughing is a very important activity due to following reasons:

- It makes the soil airy



- Loosened soil allows roots to penetrate better into the soil
- More airy soil promotes growth of microbes & earthworm, which in turn improves the soil fertility



- Earthworms' castings contain nutrients useful for plants growth
- Microbes Decompose dead organisms & release nutrients into the soil
- Soil fertility is improved
- Nutrient rich soil is made available to plants
 - Organic matter & minerals are present in top soil layers, but plant roots can reach only a few cms depth. By loosening the soil, lower nutrient rich layers can be brought up.

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Watering

Watering

Watering is the process of giving water to the field to make the dry soil wet before ploughing. It is needed only if the soil is too dry. Ploughing directly on dry soil is difficult, hence watered to wet the soil.



Once watered, bigger crumbs of soil are broken down into smaller pieces. This process is termed as Puddling.

Puddling reduces permeability and percolation losses. The more permeable the soil is, the greater is the seepage. Permeability is directly proportional to particle size. Therefore, Puddling reduces the particle size which therefore reduces the permeability.

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Levelling

Levelling

Levelling is flattening of the soil after puddling. Leveling is done with a leveler.



Class 8 Biology Crop Production and Management Agricultural tools for soil preparation

Agricultural tools for soil preparation

Plough, Hoe & Cultivator are three important tools which help in soil preparation.

Plough

Tool used for ploughing . It is made of iron/ wood. It is pulled by a pair of animals like cows/ oxen/ horses and operated by the farmer through the handle. It has 3 important parts:

- Ploughshare: strong triangular iron strip
- Plough shaft: long log of wood
- Beam: stand placed on animals' neck



Hoe

Hoe is a tool used for loosening soil. It is made of wood or iron. A strong iron plate attached to the long rod acts like a blade and helps to loosen the soil. It is also pulled by animals.



Cultivator



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Sowing

Sowing

Scattering seeds on the Earth after soil is prepared for cultivation is termed as Sowing. It is the most important part of agriculture. Plants can't grow without seeds. The type of seeds sown decides the quality of crops that would come out of it.



Good quality seeds should always be sown. Good quality seeds (clean healthy seeds with high yielding capacity) can be easily distinguished from the bad ones. Once put in water and left for some time, the damaged seeds being light & hollow would float on the surface.



Manual sowing of seeds involves time and labor. Equipment like seed drill helps in sowing seeds using a tractor. Some advantages of using a Seed Drill are:

- Sow seeds at uniform distances
- Protect seeds from being eaten by birds
- Saves time
- Saves human labor



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Application of Manures & Fertilizers

Application of Manures & Fertilizers

It is very important to enrich the soil with nutrients to improve crop productivity. This is why manures & fertilizers are applied.

Manure is an organic substance that increases soil fertility. It is prepared from decomposition of animal excreta & plant wastes. It consists of Organic matter and nutrients essential for the plant. It improves the soil structure by increasing its water holding capacity, and also avoids water logging.

Some of the advantages of using manures are:

- Improves soil texture
- Restore soil with all nutrients
- Increases water-retaining capacity of soil
- Non-toxic
- Eco friendly
- Recycled biological product



Fertilizers are commercially produced plant nutrients. They result in higher yields & healthy plants, if applied in proper dose. Enrich the soil with good amount of macronutrients like nitrogen, phosphorus & potassium. There are a few disadvantages associated with use of fertilizers like:

- Cause water pollution, if followed by excessive irrigation
- Excessive use can spoil soil fertility (organic matter & micro-organisms are harmed)

Considering all the advantages and disadvantages, Organic farming is preferred these days. Organic farming refers to farming with no/ minimum use of chemicals and maximum use of manures with healthy cropping patterns.



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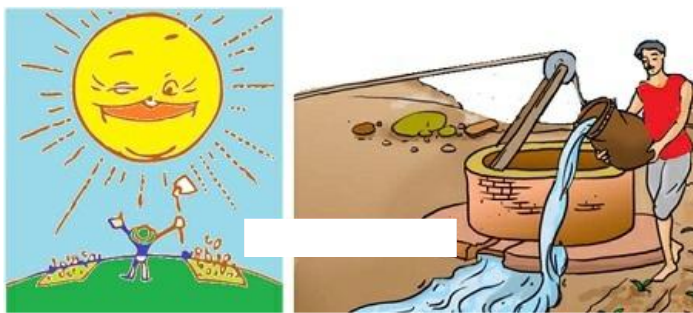
Irrigation

Irrigation

Irrigation is artificial application of water to soil to ensure growth of agricultural crops.

Water is very important for growth of plants as it helps in germination of seeds, absorption of dissolved nutrients, photosynthesis and temperature regulation.

Irrigation is very much needed in India due to irregular distribution of rainfall. If agriculture is left dependent on rains, then it will suffer during the dry seasons of the year.



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Traditional methods of Irrigation

Traditional methods of Irrigation

Different types of irrigation methods are used depending on the different water resources like wells, canals, river lift systems and tanks.



Many of these traditional methods of irrigation like wells involve groundwater extraction. Tanks act as artificial reservoirs of water to be used for irrigation.

There are certain disadvantages associated with traditional methods of irrigation like:

- Too much human labor involved
- Less efficient due to uneven distribution of water
- Wastage of water

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Modern methods of irrigation

Modern methods of irrigation

Modern methods of irrigation being able to overcome the limitations of traditional methods are encouraged these days. Some of the modern methods of irrigation are:

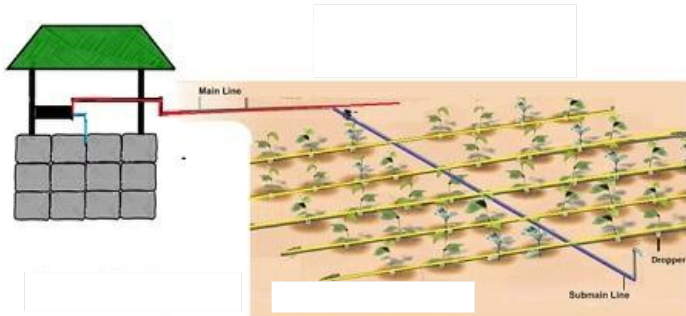
Sprinkler system

In this system, there are perpendicular pipes with rotating nozzles on top. These pipes are joined to the main pipeline. Water flows through main pipeline under pressure by a pump. Water escapes from the nozzles & reaches the field.



Drip system

In this system, water falls drop wise near roots. Therefore, there is no wastage of water. This method is very good for areas with less water.



Modern methods are more efficient with no water wastage and no human labor involved.

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Protection against weeds

Protection against weeds

Weeds are unwanted plants in the cultivated field. They compete for nutrients, space, water & light, therefore, adversely affect crop growth.



Weeds can be controlled by applying weedicides. These are chemicals which kill weeds without damaging the crops. These chemicals are diluted with water and then sprayed with a sprayer to the field. Since these chemicals are toxic, therefore farmers should cover their mouth/ nose while applying weedicides.

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Harvesting

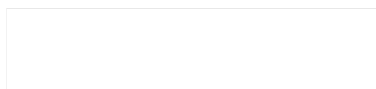
Harvesting

Harvesting is cutting of crop after it is matured. The season of harvesting brings a lot of happiness as this is time when the hard work of farmers brings results.

Harvesting can be done manually using a sickle or with a machine called Harvester.



Sickle



Harvester

Harvesting is not only about cutting crops, but also involves separation of grain seeds from chaff (thin covering of grain). This process of separation of grain seeds from chaff is called 'Threshing'.



Grain



Chaff



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Threshing methods

Threshing methods

Threshing can be done manually using a process called **Winnowing**.

Winnowing is based on the principle that chaff being lighter is blown away by wind whereas, grains being heavier fall back. In this process, grains are separated from chaff by throwing into the air. Chaff gets carried away by wind, while grains fall back.



Threshing can also be done with the help of a machine called 'Combine'. Combine is an automated machine that does both harvesting as well as threshing, hence called **Combine Harvester**.

In a combine harvester, there are different types of headers to cut different types of crops. There is a rotating wheel which pushes the crop towards the cutter. Sharp teeth like structure open & close to cut the crops. A threshing drum inside separates grains from chaff. Grains are collected in grain tanks. Chaff moves down the straw walkers towards back side of the machine, from where it is thrown out. The grain tank gets unloaded when full.



Leftovers on the field post harvesting should not be burned as it causes air pollution and also can damage existing crops in the field.

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Storage

Storage

Proper storage of food grains is important to protect against moisture, micro-organisms & insects.

Moisture favors the growth of spoilage bacteria. Therefore, food grains should be well dried before storage. If attacked by microbes/ insects, food grains might lose their capacity to germinate. They should be stored in metallic containers or jute bags. Neem leaves also prevent growth of microbes and insects as they contain alkaloids which repel pathogens.

