

13.1 AGRICULTURE

You know that food is one of the basic requirements of all living organisms. Man along with most animals obtain their food directly or indirectly from plants. From ancient times man has farmed the lands for obtaining food. Plants of a common variety grown in a particular area for a particular purpose is called crop. Growing different types of crops and their yields is called agriculture.

In present situation occupations and activities connected to agriculture as animal husbandry, poultry, fisheries, apiculture and mushroom production are also included under agriculture. We can define agriculture science as :- Technical knowledge about the management & mass production of different crops and animals useful for man is known as 'Agricultural science'.

13.2 TYPES OF CROPS

Do all type of crops grow in the same season? Different crops are grown and their yield are collected in different seasons. Growth of the crops and their production depends on the factors- soil, rainfall, light and temperature factors. According to the seasons we can differentiate the crops into three kinds-

1. KHARIF/AUTUMN CROPS

These crops need much water and heat (temperature). These are grown in the rainy season. These crops are sown during monsoon that is June-July and are reaped in October-November. Main kharif/autumn crops of our country are paddy (rice), maize, green gram (moong) blackgram (Urad), jawar, millets, sugarcane and cotton.

2. RABI/SPRING CROP

These crops needs moisture and less temperature. These are grown during winter season. They are sown in October-November and reaped in March-April. Main rabi/spring crops are wheat, bengalgram, mustard, barley, lentils, pigeon pea (Arhar), kusum, linseed etc.

3. JAYAD CROP

Some crops yield more in dry weather. These are usually sown in December to February and by March to May these crops are ready to reap. Some main crops are Water melon, Musk melon, Cucumber, Sunflower, Ground nut etc.

13.3 METHOD OF AGRICULTURE

Every farmer's main aim is to get maximum yield from the available land. For this he makes many preparations and follow different procedures. All these jointly is called the agricultural methods. During the production of crop these methods are in a systematic sequence which starts from the preparation for sowing of the crop to the ripening of the crop. Then the yield is reaped and stored. Come, now we will see the agriculture methods.

13.3.1 SELECTION OF THE LAND

For maximum yield farmer selects an appropriate land where the seed may germinate and grow easily and also where it can get the required amount of nutrients, water and air.

13.3.2 PREPARATION OF SOIL OR LAND

In the first stage of land preparation, the farmland is ploughed. For this the simple traditional plough or the soil over turning plough is used. The traditional plough only cleaves through the land but the soil turning plough not only cleaves but also turns the mud out (fig 13.1 a & b).

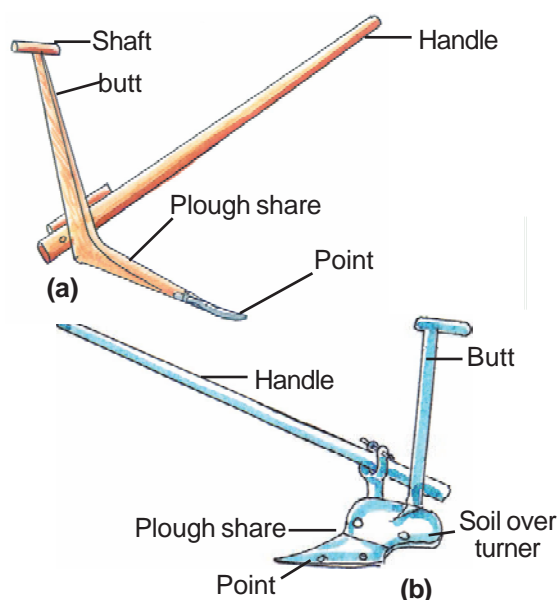
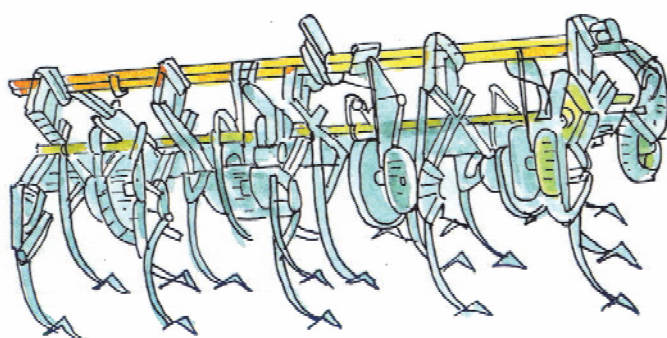
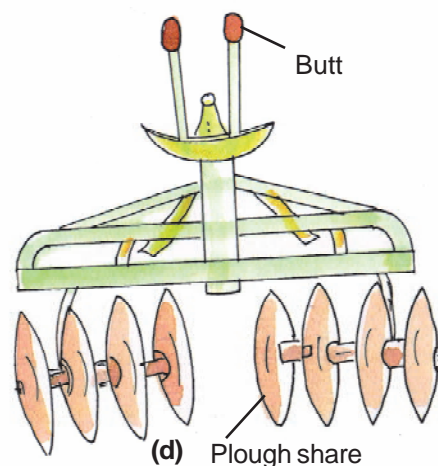


Fig 13.1 (a) Traditional plough, (b) Soil overturning plough



(c)



(d) Plough share

Fig 13.1 (c) Cultivator, (d) Harrow

After the paddy crop the lands becomes much hard for the rabi crop. To prepare this land traditional plough is not sufficient. For this tractor or power run cultivator, Rotawer or Harrow is used (Fig 13.1 (c) (d)).

ADVANTAGES OF PLOUGHING

1. Soil becomes loose such that its capacity to retain water and air increases. Due to which roots develop faster.
2. The left out part of earlier crop and grass etc. mixes with soil and becomes manure for the soil.
3. Disease creating insects, worms and their eggs are exposed and are inactivated in the sunlight.
4. Crop friends as earthworm millipeds bacterias and fungi get the facility to develop further and thus they increase the fertility of the soil.
5. The fertilizers and manures mixed with the soil before ploughing gets evenly distributed.

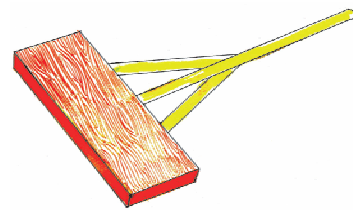


Fig 13.1 (e) Wooden block or harrow plank

After ploughing, the soil in the field may have big lumps. So before seed sowing and irrigation, these lumps are to be leveled. For this wooden block is used(fig.13.1 e).



NOW ANSWER THESE

1. Can you say that Ipomea or some weeds grown in some place is said to be a crop? Give reasons.
2. Write the different crops according to seasons.
3. What are the traditional and modern equipments used in ploughing?

13.3.3 SELECTION OF SEEDS & SEED TREATMENT

Which ever crop is chosen, the seeds of it must be completely healthy, having good germinating capacity and resistance to diseases. For a good yield improved and hybrid seeds must be used. Selection of good seeds can be done by the following methods.

Come let us do an experiment -



Activity 1

Material required - A big beaker or bowl, about 50 g of old wheat or bengal gram (whole) and water.

Soak the wheat or bengal gram in the water in the bowl and observe it after two to three hours. What do you find? Those seeds which float are lighter. They are hollow because of being eaten by worms. Such seeds do not swell and do not germinate hence are useless. Those seeds which are at the bottom are healthy and useful seeds.

Seeds may have fungus or other disease germs and their eggs on them, which may affect their germination. Therefore, the seeds must be treated with fungicides or insecticides solution. Outer skins of some seed are very hard such that their germination takes much time. Such seeds must be soaked in hot water for three to four hours, so that their skins may become soft and may easily germinate. The process of preparation of seeds by treating them against infections and for easy germination, before sowing is known as treatment of seeds.

Hybrid Seeds

Seeds with different characteristics are selected and artificially bred to get new improved and better seeds. These type of seeds are called Hybrid seed. Hybrid seeds are of better quality.

13.3.4 SOWING OF SEEDS

Planting the seeds in the soil for germination is known as sowing of seeds. For sowing of seed it is necessary to see if there is sufficient moisture, air and light needed for germination. And also if there is enough space between the seeds. The following are the different ways of sowing of seeds.

(1) Scattering method

In this method the seeds are scattered through out the field by hand. And then the field is ploughed (fig 3.2) due to which the seeds get embedded in the soil. By this method a large area can be covered in less time. Mostly all grain crops are sowed by this method. Try to find out if bengal gram, peas, tomato and vegetables are sowed by this method or not.



Fig 13.2 Sowing by scattering method

(2) Ploughing-Seeding method

To sow by this method a machine is used. In any simple ploughing-seeding machine there is a long tube with a funnel on one end. This is tied to the plough. The

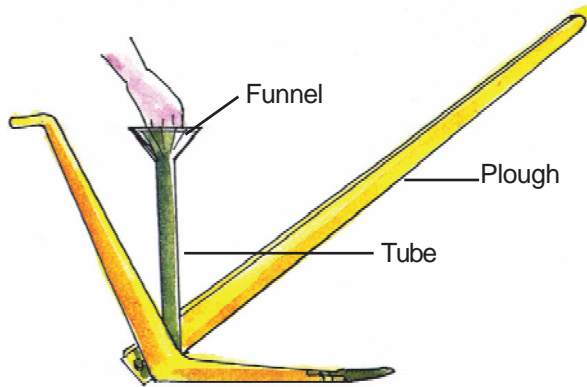


Fig 13.3 (a) Simple ploughing-seeding machine

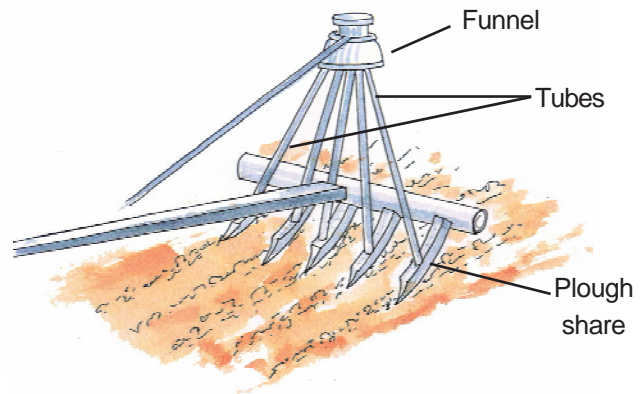


Fig 13.3 (b) Improved ploughing-seeding

Fig 13.3 Ploughing-seeding machine

seeds are filled in the funnel. The seeds pass through the pipe or tube into the furrows made by the plough (fig 13.3a) In this way seeds are sown in a line and at similar depths. In a improved machine a funnel is attached to five to six tubes (fig 13.3b) By this five to six furrows can be sown at a time. This machine can also be used with a tractor.



Activity 2

Materials required : Four equal sized beakers, wheat grains, soil and water.

Label each beaker and name them A, B, C, D. Put ten healthy grains of wheat in each beaker. Now fill beaker A, B & C with soil upto 3 cm and fill beaker D to 6 cm height. Now Fill beaker A full of water and keep it that way. Keep the beaker B dry. Add only that much water to beaker C and D that the soil remain moist.

Observe the beakers for some days and answer the following questions.

1. Which beaker shows maximum germination?
2. Did beakers A, B & D germinate? If they didn't then why?
3. Write the favourable conditions for germination.

3. METHOD OF PLANTING

Some crops as onion, chillies, tomatoes, cabbages, brinjals etc. are not grown directly, that is their seeds are not sown directly into the field but

they are sown in small nursery farms or boxes and when small saplings appear, the healthy saplings are selected and planted in the fields at regular intervals. This is known as planting method.



Fig 13.4 Planting method

In our country where there is sufficient water supply and irrigation facility, sowing of paddy (rice) is done by **planting method**.

13.3.5 MANURES AND FERTILIZERS

For proper growth of the plants, different minerals are needed. These are called plant nutrients. Plants usually get them from the soil. But continuous farming deprives the land of nutrients due to which the fertility of the soil diminishes. So to keep the soil fertile the farmer adds fertilizers and manures.

Manures are usually prepared from remains of plants and animals as their wastes, garbage and decaying things. These are called biotic manure. The different types of biotic manures are -

(1) Dung manure (Gobar Khad)

The cattle excreta is made to decompose in a pit. This makes a very good manure.

(2) Compost manure

This is prepared by decomposing organic matter derived from vegetable waste, garbage, animal refuse placed in large pits or specially designed tanks. In this, dung and animal refuse is in less quantity, but this also has much nutrients as dung manure.

(3) Green manure

Different legume crops as sun hemp, horse gram, cowpeas, beans, lentils and branched plants are ploughed back into the soil and they decompose to form green manure. This manure is good for paddy, corn and wheat crops.

Come, we will make compost

In your school compound or any open place, select a place which is not much visited or is not used for some work. Prepare a 1 metre deep pit with the help of your environment club students or your friends. Fill the pit to 30 cm with garbage as paper pieces, broken twigs, dry leaves, vegetable, fruit skins, cattle dung. Now spray a mixture of dung, soil and water over this. Again make a layer of garbage and soak it again with dung-soil mixture. Continue this layering till about only about 50-60 cm is left. Now fill the rest with wet soil and cover it tight with dung mixture and leave it like that. After 3-4 months you will find the pit has shrunk and the matter in the pit has turned to black crisp substance. This is compost you can use it as manure for your garden and also keep your school premises clean.

Vermi composting

For quicker composting of organic matter, earthworms are used. Earthworms eat the decomposing organic matter and their worm casting are rich in nutrients. This is known as vermicompost. This has nitrogen, phosphorous and potassium etc. nutrients in sufficient quantity. Earthworm remove garbage from the environment and helps to keep the environment clean. It also provide manure. In this way earthworms are useful to man in being 'environment friendly' and a 'farmer's friend'.

4. Fertilizers

Some nutrients as nitrogen, phosphorous and potassium in the soil is enriched by the farmers by adding chemicals. These are called **fertilizers**.

(1) Nitrogenous fertilizers

These provide nitrogen to the plants. Main nitrogenous fertilizers are Urea, Ammonium sulphate, Ammonium nitrate etc. These are necessary for leafy vegetable crops as cabbage, spinach etc. and by their use plants grow fast.

(2) Phosphatic fertilizers.

These provide phosphorous to the plants. By their use the roots and stems of the plants are strengthened. They are necessary for legume crops. Calcium super phosphate is a phosphatic fertilizer.

(3) Potassium fertilizer

These provide potassium to the plants. These are beneficial to root crops. Potassium sulphate, potassium chloride are the main potassium fertilizers.

For the crops different methods are adapted to add the manures and fertilizers in the field, as spraying over the fields putting them around each plant in furrows, dissolving the fertilizer in water and spraying them with sprayers or placing them on the mouth of irrigating pipes so that they may mix with the water and reach the plants.



Fig 13.5 Spraying of fertilizers

Proper use of fertilizers increases the yield but excessive use of it, may make the chemical flow over by rain and irrigating channels to the near by rivers and ponds and pollute them, and disturb the ecological balance.

Observe the ponds and lakes nearby where fish are bred and kept. Here for feeding the fish, some fertilizers and manure are added to the water. Due to their effect the number of algae and other water plants is increased so much that the whole water of the pond looks green. After some time there is a foul smell also. Discuss with your teacher why it is so.

*Changes due to an increased number of algae can decrease the amount of dissolved oxygen in the water. So the other organisms in the water do not get sufficient oxygen, due to which they die. This state is called **eutrophication**.*

You must be knowing of the micro organisms which can fix the atmospheric nitrogen, such that it increases the fertility of the soil. Can you tell the name and place where these are found?

In a paddy field when the farmers fill it with water then large amount of green coloured microorganisms are formed in the water. These are blue green algae. These also help in the fixation of atmospheric nitrogen and increase the amount of nitrogen present in the land. Farmers use micro organisms and blue green algae as bio-fertilizers to increase the yield of the crops.

Crop rotation

When the same type of crop is grown again and again, then the fertility of the soil decreases. To maintain the fertility of the soil, different type of crops must be sown one after other. Usually a legume crop is sowed after a grain crop, which helps in retaining the nitrogen in the soil.

Mixed cropping:- When two or more different crops are grown together in the same field, it is called mixed cropping. When two or more different crops are grown in definite rows it is called inter-cropping.

Example:- (1) wheat ↑ gram ↑ mustard (2) groundnut ↑ sunflower

13.3.6 Irrigation

Watering of crops is necessary at regular intervals. The process of providing water to the plants artificially is known as irrigation. With the water from irrigation the plants perform the activities of absorption of minerals, photosynthesis and other biological functions. The amount of irrigation depends upon the type of soil and the requirement of water by the grown crops. The summer season crops (kharif) need more water. You must have seen the paddy fields filled with water, right from the plantation of seedlings to harvesting of the crop. Whereas the winter season crops (rabi) do not need much water.

Sources of irrigation

Can you tell which is the main source of water? A field cannot get water from rains at all times. Farmers use water from dams, rivers, ponds and underground

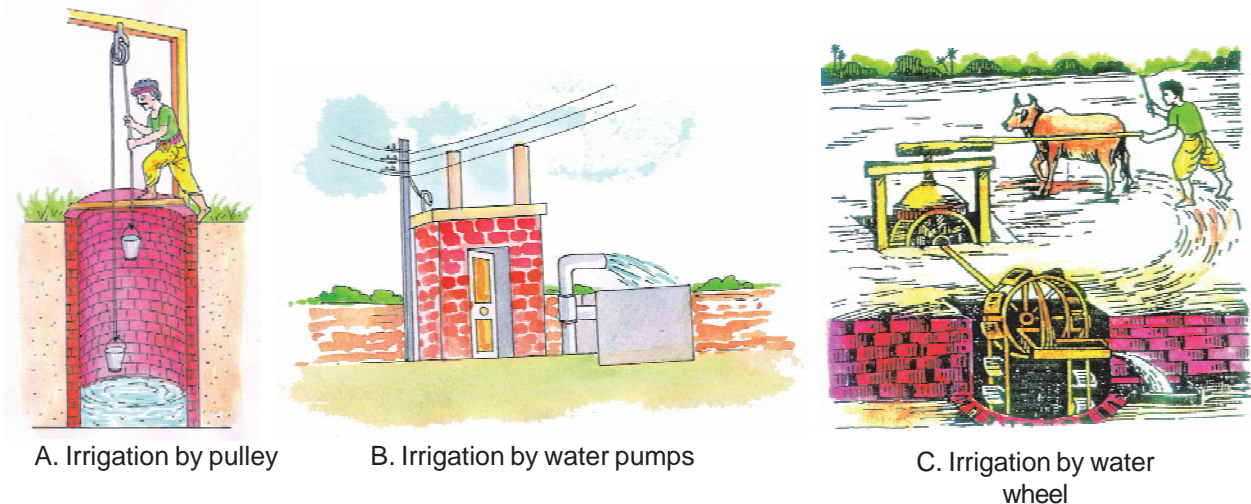


Fig 13.6 Different source of irrigation

sources to irrigate their fields. On large scale irrigation is done through canals from the dams built on the rivers. On small scale irrigation is done from ponds, wells and pipelines. From the wells, water is pulled up with the help of a pulley or a seesaw-lift (Dhekuli) or a water-wheel and water is transported to the fields through canals. (fig 13.6) For irrigation, machines as motor pumps and submersible pumps are also used to pump up water from the water sources.

It is beneficial to irrigate the crops in the right time and in right quantity. What would happen if the crops are irrigated irregularly and unnecessarily? In both the cases the crops would fail. If there is more irrigation than needed, then it would harm the soil- aeration. When water accumulates in the field for a long period, there is a shortage of transfer of air in the soil, due to which the roots of the plants do not get sufficient oxygen and starts decaying. This is called flood.

New techniques of irrigation

With the new techniques of irrigation water wastage can be lessened. These measures are:-

Sprinkler or fountain method irrigation

In this method standing crops are artificially showered with water. Water is passed at high pressure through pipes and it comes out through outlets of small pores, fitted on wheel shafts, in form of showers. (fig 13.6a) This method of irrigation is perfect in uneven lands where no other method is effective.

Drip irrigation

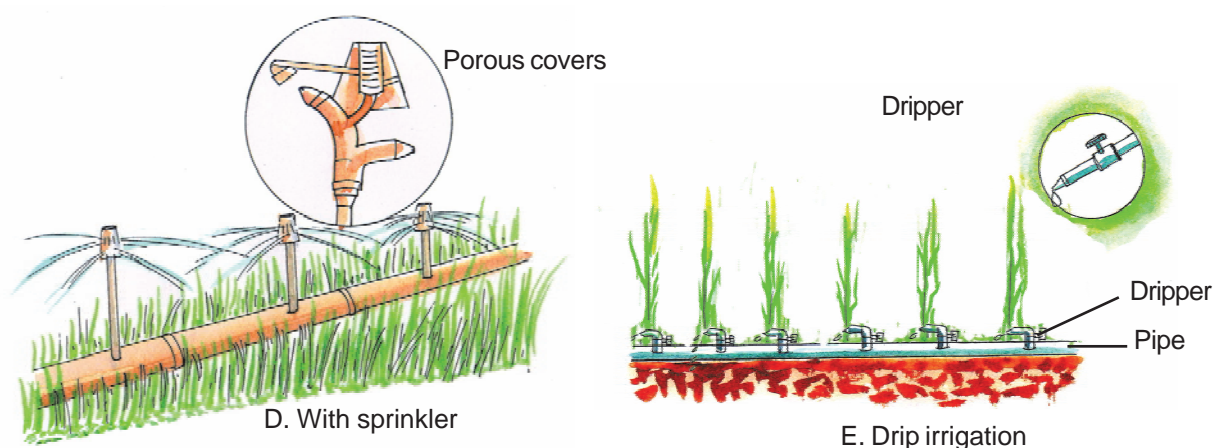


Fig. 13.6

In this method water is send directly to each plant from a compressor. Water flows through closed pipes and falls in drops through small minute pores. (fig 13.6b) By this method fertilizers and other chemicals are also given to the plants.

Which crops are watered through drip irrigation ?



NOW ANSWER THESE

1. What is seed treatment?
2. Why is it necessary to plant seeds at reasonable depths?

3. How is compost made?
4. Why is the earthworm called the 'farmer's friend'?
5. What are fertilizers?
- 6 Why is irrigation necessary for crops?
7. What are the new irrigation techniques?
8. Can we plant or grow grains and gourds in the same field? Explain giving reasons ?

13.3.7 Weeding or weed control

The unwanted plants which grow along with the crops are called **weeds**.

Can you tell why is it necessary to remove the weeds from the crops? These weeds compete with the crops for nutrients, water, space and sunlight, which can hinder proper growth of the crop plants. Due to which the quality and production gets affected. Some weeds hinder the harvesting of crops and some are poisonous to animals and human beings.

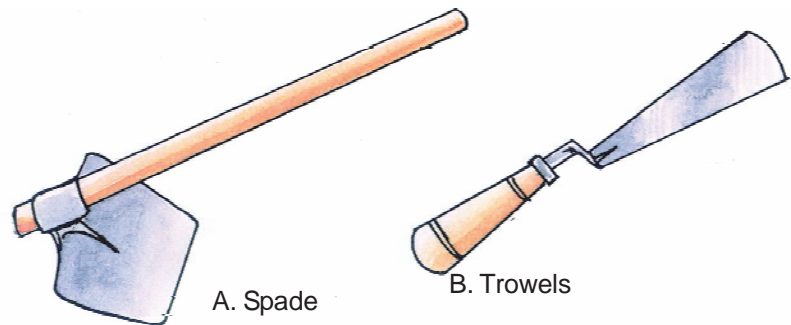


Fig 13.7 Tools to control weeds

The process of removing the weeds from the crops is called **weeding** or **weed control**. The weeds which grow with the summer season crops (kharif) and the winter season crops (rabi) are different. Some of them are as follows -

Summer season crop weeds :- rot(dhubi), sauwa, kausi, nut grass (Motha), amarantus (chowlai), trianthema(Satthi), sarkanda etc

Winter season crops weeds :- Chenapodium (bathuwa), wild oats (jungali jaii), convolvulus (hirankhuri), bhungari, red rot (lal dudhi).

Usually weeding or removal of weeds are done by hands or by simple tools as spades, trowels, hoes and harrow cultivator. (fig 13.7). Weeds are also destroyed with some chemicals which are called weedicides. In nature there are living organisms which selectively destroy the weeds. For example, an insect is used to control the growth of cactus and some fishes as grass carp is used to control water weeds. Weed control by living organisms is called biological weed control.

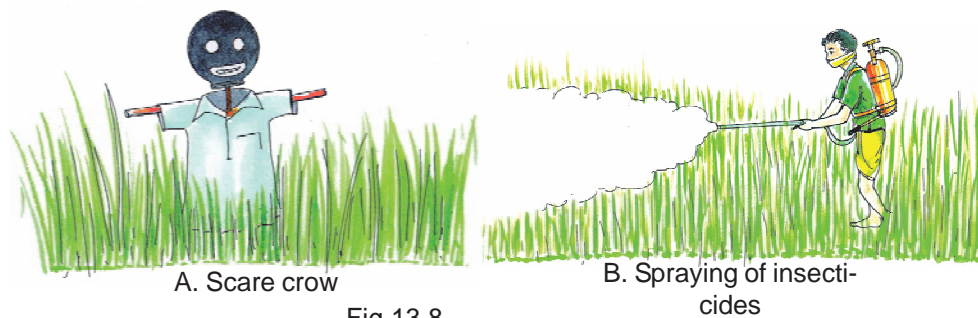


Fig 13.8

13.3.8 Crop protection

Crops are affected by many external factors. Can you tell what can affect or harm crops? The organisms which harm the crops, as animals, birds, insects, disease causing micro organisms- bacteria, virus and algae are jointly called pests.

Come lets find some measures to control them.

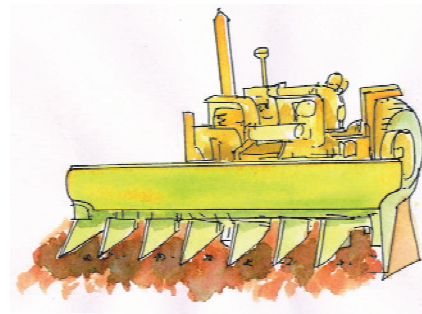
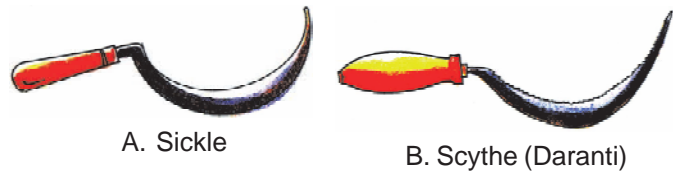
1. Fields can be protected against grazing by stray and wild animals, by making boundaries on fields and fencing them with thorny wires.
2. Scarecrows can be placed in the fields to drive away the birds. Even sound of the beating drums can keep them away. (fig 13.8a)
3. Protection against pests as bacteria, fungus, insects, rats and squirrels can be done by spraying pesticides, fungicides and insecticides.(fig 13.8b)
4. Protection from pests can also be done with the help of some parasites predators, bacteria, and fungus. This is called biological method of pest control. Trichogermia is a parasite which grows on sugarcane, grams, groundnut and feeds on the disease causing insects and their larvae. Predator insect coccinella destroys *mahu*. Predator birds as cranes, ducks and swans play an important role in biological pest control. They feed on the insects on the crops and destroy them.
5. Before sowing, the land must be tilled properly, such that the buried eggs and larvae of the harmful insects may be exposed to the Sun and be destroyed.
6. Mixed cropping is a very effective way of pest control from insects. Even selection of adequate crop rotation cycle also helps in pest control.

An advice

Pesticides directly affect our health. These chemicals flow into the soil and are absorbed by the plants. These may also form a layer on the leaves and fruits. That is why we must always wash the fruits and vegetables thoroughly before use.

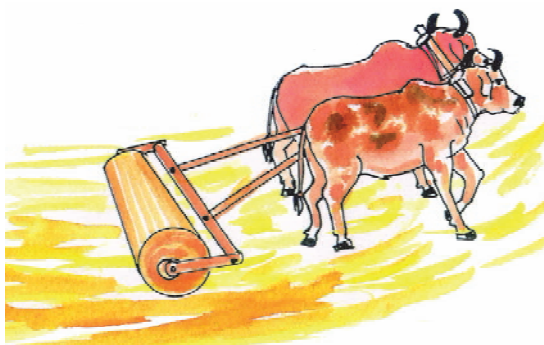
13.3.9 Crop harvesting and threshing

After maturation of the crops, reaping the crops is called **harvesting**. Reaping is done by hands or by using tools as sickle, scythe or reaping hook. Rice and wheat is reaped by machines called harvester (fig 13.9). Fruits and vegetables are picked with hands. Tractors or power-triller are also used for reaping. After reaping the harvest the grains have to be separated. This



C. Harvester

Fig. 13.9

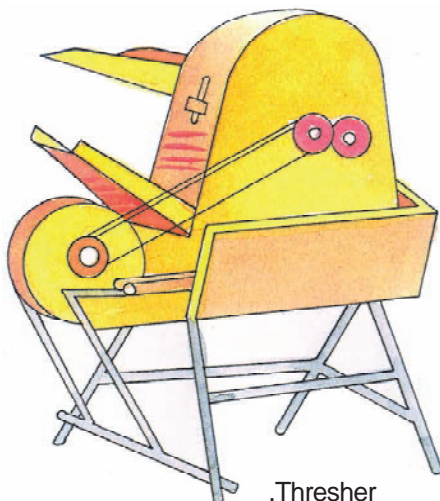


Rollers

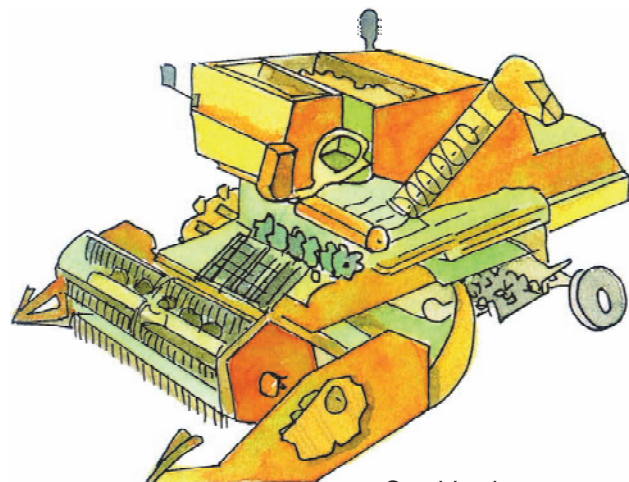


Suppression

Fig. 13.10 A. Traditional methods of threshing



.Thresher



Combine harvester

Fig13.10 B. New machines used for threshing

process of separation is called threshing. Traditionally threshing was done by the roller and suppression method. Tractors are also used for this purpose. Some farmers use threshers for this purpose. Combine harvester is a type of agricultural machine, by which, both reaping and threshing is done. After threshing, removing the husk from the grain is called **winnowing**.

13.3.10 Storage

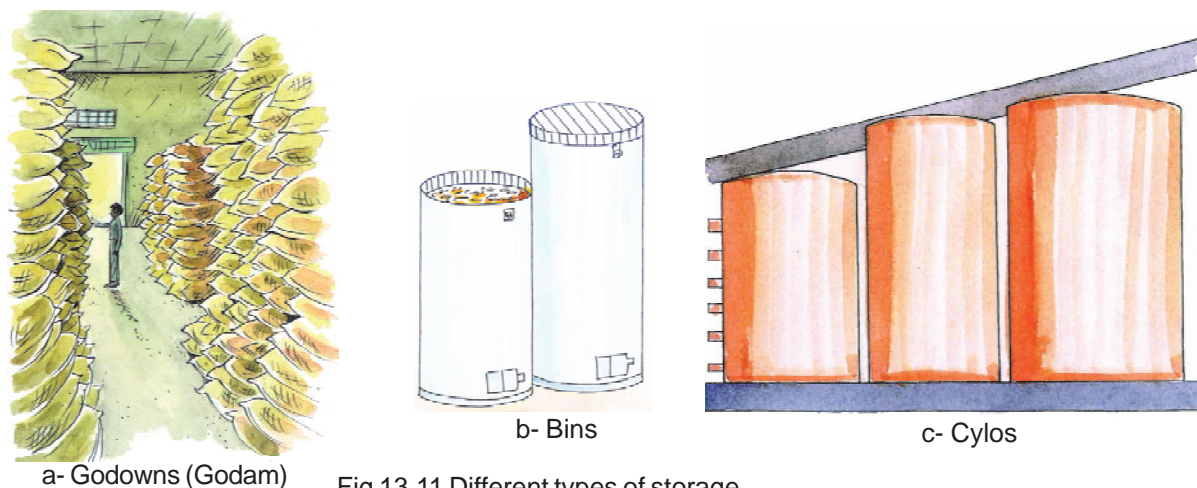


Fig 13.11 Different types of storage

After reaping and threshing grains and other products in large quantities are to be stored safely. This is called storage. From harvesting to the use of the grain about 10 % is lost due to many factors as transport, godown, warehouse process, accumulation and storage process. Due to improper storage about 30% is lost to insects, rodents, rats, moisture and diseases. Farmers and traders store grains in big godowns, bins and cylos. In national level storage of grains at centre and state is done by Food Corporation of India –FCI in warehouses.



Activity 3

To know about the type of storage in your town or village by farmer and trader, in godowns and warehouses, by food corporation. Go for a survey with your teacher's help. Write your observations on the following points.

1. Type of storage;- room/ godown/ warehouse/ cylo
2. Walls have been whitewashed and sprayed with insecticides.; yes/no
3. Name of the sprayed insecticides_____.
4. Is there proper moisture in the grains.(break the grains with your teeth and check if there is a 'cut' sound, then it is suitable for storage.) yes/no

5. Where is the grain stored; -filled in the sacks/ spread on the floor.
6. Are the sacks treated with insecticides or is the floor plastered with cowdung: _____
7. The sacks are kept away from the walls/ are the sacks kept on wooden planks.
8. Proper sunlight and ventilation is there in the room/godown. Yes/no
9. Are there spider webs or insects on the roof or the walls of the room. Yes/no
10. Are vapours of chemical insecticides used on the grains for protection. Yes/no
11. Name the insecticide used. _____
12. Any other remarks _____.

Cold storage

Fruits, vegetables and also potatoes, onions, garlic, ginger, and other perishable crop products are kept in cold storage or warehouses maintained at low temperatures. In the cold storage the low temperature stops or retards further ripening of the products and also growth of micro organisms and thus stops the products spoilage.



NOW ANSWER THESE

1. Why do fruits and vegetables spoil faster in summer and remain fresh for more time in winter?
2. What are weeds ? Why is weed control necessary?
3. How can you protect your crops from pests?
4. For which work is the combine harvester used ?
5. How are crop products stored?

Mushroom cultivation and mushroom culture-

In rainy seasons you must have seen small white or brown umbrella shaped growths on the fields, wood, straw etc. These are mushrooms. In different places they are known by different names as phutoe, khumbi, dhigari etc. Mushroom is a fungus which has proteins, vitamin B complex, vitamin C, minerals and fibre in large quantity. That is why it has a special category in the edible items of the world .

Mushroom is purely a vegetarian food as they are grown on wheat husk, straw, and other mediums which are prepared by mixing mushroom spores. Professionally two types of mushroom farming is done in our country; - Dhingri mushroom and white button shaped oyster mushrooms.

Medium of wheat husk or straw is soaked in water for 14 – 20 hours and then it is boiled for two hours or is processed with fungicides or antibiotics. Now water is drained away and the spores of the mushroom are mixed in it. This is now placed in polythene bags which have holes in it. This is then kept in a room with a temperature of about 20°– 25° centigrade. In about two or three weeks the whole medium changes into a ball of white colour.

Now the polythene is removed and this ball is hanged by a string for two or three days, when this is covered with small pebble like structure. These develop into umbrella shape in five to seven days. These are the mushrooms.

Many species of mushrooms are poisonous, so you must use them only after consulting your teacher or a knowledgeable person.

13.4 Crop improvement

By adapting proper irrigation, fertilizers, manures and improved agricultural methods, the production of food grains can be increased. Another method for a better yield is improvement of crop variety. This process is called crop variety improvement or crop improvement.

13.5 Food products obtained from animals

For obtaining the necessities of food, man not only depends on crop products but also on animals and other living organisms. For proper development of our body, we need proteins which is obtained, apart from pulses, from milk, eggs and flesh also. We tame all those animals which can fulfill our needs connected with food. The proper care and rearing of these animals scientifically is called animal husbandry.

Come let us know about some of these animals and the food products we get from them.

13.5.1 Milk Production

In our country the number of cows and buffaloes is maximum. These are called the milk producing 'milch' or dairy animals. They are reared in large numbers in large farms. Milk production is the second largest production after rice production in agriculture. Although buffaloes are the better producers of milk but cows are the main source of milk production.

For proper rearing of dairy animals, they need proper nutrition, care, shelter, health, and breeding. For their diet grass, dried fodder (straw or wheat husk), green fodder is needed. To make their diet more nutritious, mustard and cottonseed oilcakes are also added. For proper health along with a nutritious diet, proper sanitation and medical treatment and care is also necessary. Availability of drinking water and clean, ventilated shelter is also needed.

By hybridization improved breeds of cows and buffaloes are developed. High yielding breeds of cows are Freisian Sahiwal, Halstein- Freisian, and for buffaloes the breed is Murrah.

13.5.2 Poultry farming

Rearing of hens, ducks and other birds for eggs and their meat is known as poultry farming. Hens are reared at homes and also at farms. Hens sit on eggs for 21 days to hatch them. This is the hatching period. In big poultry farms, eggs are hatched in special rooms or boxes called incubators. In these, the eggs get the required moisture and heat, which help in the growth of the chicks inside the eggs and later helps in their hatching.

Hen breeders sometimes place paddy grass on the floor to provide adequate heat. Hens which sit on the eggs for them to hatch is called the brooding hen. On the seventh and ninth days the eggs are examined and the underdeveloped eggs are removed. During winter season, as the days are shorter and the presence of moisture in the air and in case of insufficient food, the production of eggs decreases.

The eggshell is made of Calcium carbonate. The middle part of the egg is called yolk which is covered by the transparent albumin. There is much protein in the albumin.

The food given to the poultry contain small worms, insects, vegetation and also small pebbles. These pebbles help in crushing the food. These are mixed with lime stone, which help in the formation of the eggshell.

In poultry farms the shelter of the birds have proper ventilation and light arrangement. The droppings of the birds are used as manure. For higher yield in eggs and meat (broiler) improved varieties are obtained by hybridization. White leghorn, Rhode Island Red, ILS-82, B-77 are some main varieties.

13.5.3 Fish production

Fish is one of the main foods of people living near the banks of rivers and the sea. This animal is a good source of protein. The oil of cod and sharks are the main source of vitamin D. Fish is also taken as dried food and processed tinned food. Fish

is also used as food for poultry and cattle. Some parts of the fish like tails, fins, and bones are used as fertilizers.

Large scale production of fish is known as fish production. Fish producing farms and ponds are called fisheries. In these fish are hatched and small fishes are produced. These are placed in big ponds for nourishment and growth, where there is proper arrangement of food, oxygen and light. At times fish are caught from these farms also.

As per the source of water, where they are found, the fish are grouped as non-salty water fish eg. katla, lobia, rohu. And those in seas and oceans as salty fish eg. tuna and cod. By reproduction and hybridization new varieties which grow faster and in less time are developed.

13.5.4 Bee keeping or Apiculture

Bee is an insect from which we can obtain honey. Honey has water, sugar, minerals and enzymes in it. Honey is easily digestible. Though honey is not used as a food regularly, it is used as a medicine. It is used in many common diseases as cold etc. For obtaining more honey bees are kept in special boxes. Artificial rearing of bees is called bee keeping or apiculture.

Bees are usually found in forests. They make their homes on tall trees and high building. These are called beehives. The special boxes prepared for bee rearing takes the place of their hives. All their life activities takes place in this boxes. Laying of eggs by the queen bee, larvae hatching out of eggs, formation of pupae, care of them by the worker bees, collecting pollen grains from the flowers and converting it to honey, all takes place in the boxes. Honey is removed from this by hand or by machines. The collected honey is then kept in air tight bottles. Wax is also obtained along with the honey from apiculture.



WE HAVE LEARNT

- Technical knowledge of production and management for higher yield of man needed crops and animals products is called agriculture.
- According to the yield in different seasons the crops are of three types – kharif, rabi and jayad.
- Necessary planning and farming activities for farming of crops is called crop methods or farming practices. The following are the steps

- selection of land
- preparation of land
- selection of seeds and seed treatment
- sowing of seeds
- Adding fertilizers
- Irrigation
- Weeding and weed control
- Crop protection
- Harvesting and threshing
- Storage
- Artificially developing new improved varieties of the same species plants by crossing plants with different qualities is called hybridization.
- Organic fertilizers and manures are added to the soil to provide the required nutrients to the plants.
- Unwanted plants which grow along with the crop are called weeds.
- Living organisms which harm the crops are called pests.
- Growing different crops one after another is called crop rotation.
- Storing the crop yield at large scale is called storage.
- Cows and buffaloes are reared for milk.
- For eggs and meat, hens and fishes are reared.
- For obtaining honey, bees reared artificially is called bee keeping or apiculture.



QUESTIONS FOR PRACTICE

1. Choose the correct alternative-

1. Incubators are used in -
 - a. In dairy products
 - b. In fisheries
 - c. In poultry
 - d. In apiculture

2. Hybridization is a technique of -
 - a. protecting crops from pests.
 - b. artificial crossing and producing seeds with required qualities
 - c. new technique of irrigation
 - d. production of more eggs
3. The carbonic product obtained from the wastes of animals and the decomposed plants is called
 - a. fertilizers b. manure c. green manure d. bio fertilizers
4. Which is not a method to maintain the fertility of the soil?
 - a. crop rotation b. mixed cropping
 - c. weeding d. leaving the land uncultivated for some time
5. Which machine is used for both reaping and threshing?
 - a. thresher b. tractor
 - c. combine d. harrow

2. Fill in the blanks -

1. Artificially prepared manure is called _____.
2. Leveling the land is done by _____ machine.
3. Removing the husk from the grains is called _____.
4. To make the fodder of dairy animals more nutritive _____ and _____ are mixed with the oil cakes.
5. To produce honey _____ are reared.

3. Find the statements which are correct and rewrite the wrong statements correctly.

1. Kharif crops require more water than rabi crops.
2. Pesticides and weedicides are not harmful to human beings.
3. Earthworms are harmful for crops.
4. Wheat is the main kharif crop of our country.
5. There is much carbohydrate and fat in mushroom.

4. Write short notes on :-

1. milk production 2. pisciculture 3. apiculture

- 4. poultry farming 5. earthworm manure
- 6. mushroom culture 7. cold storage

5. Draw sketches of the following farming tools-

- 1. traditional plough 2. simple seed dropper
- 3. harrow

6. Answer the following questions -

- 1. What are farming methods? Write the different steps involved.
- 2. You want to produce a legume crop in your school garden. What different farming steps would you follow? Write the steps in a sequence.
- 3. Which method of sowing seeds do you prefer the spraying method or the puncture method?
- 4. Why is hybrid seeds considered better than normal seeds?
- 5. Write the names of the crops which are sowed by the planting method.
- 6. Write short notes on any two new techniques of irrigation.
- 7. Due to what reasons are mushrooms considered as a food product?
- 8. What do you understand by crop improvement?
- 9. How can the fertility of the soil be maintained by crop rotation?



TRY TO DO THIS

- 1. Visit a farm with your friends and discuss about the different farming steps involved with the farmer.
- 2. How are plants which reproduce by vegetative propagation as sugarcane, potato, sweet potato, turmeric, ginger and garlic planted? Survey the nearby fields, vegetable gardens, farms and collect information about their plantation and write it in your copy.
- 3. Which river flows near your town or village? Is its water used for irrigation? If yes write the methods and sources used to bring water from the river to the fields.

