

Fig. 1.2 (b) : A seed drill

Seed drill : Nowadays the seed drill [Fig. 1.2 (b)] is used for sowing with the help of tractors. This tool sows the seeds uniformly at proper distances and depths. It ensures that seeds get covered by the soil after sowing. This prevents damage caused by birds. Sowing by using a seed drill saves time and labour.

There is a nursery near my school. I found that little plants were kept in small bags. Why are they kept like this?



Seeds of a few plants such as paddy are first grown in a nursery. When they grow into plantlets, they are transplanted in the field manually. Some forest plants and flowering plants are also grown in the nursery.

An appropriate distance between the seeds is important to avoid overcrowding of plants. This allows plants to get

sufficient sunlight, nutrients and water from the soil. Sometimes a few plants have to be removed to prevent overcrowding.

1.5 Adding Manure and Fertilisers

The substances which are added to the soil in the form of nutrients for the healthy growth of plants are called **manure** and **fertilisers**.

I saw a healthy crop growing in a farm. In the neighbouring farm, the plants were weak. Why do some plants grow better than others?



Soil supplies mineral nutrients to the crop. These nutrients are essential for the growth of plants. In certain areas, farmers grow crop after crop in the same field. The field is never left uncultivated or fallow. Imagine what happens to the nutrients?

Continuous growing of crops makes the soil poorer in certain nutrients. Therefore, farmers have to add manure to the fields to replenish the soil with nutrients. This process is called manuring. Improper or insufficient manuring results in weak plants.

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 microorganisms. The decomposed matter is used as organic manure. You have already learnt about vermicomposting in Class VI.

Activity 1.2

Take *moong* or gram seeds and germinate them. Select three equal sized seedlings out of these. Now take three empty glasses or similar vessels. Mark them A, B and C. To glass A add little amount of soil mixed with a little cow dung manure. In glass B put the same amount of soil mixed with a little urea. Take the same amount of soil in glass C without adding anything [Fig. 1.3(a)]. Now pour the same amount of water in each glass and plant the seedlings in them. Keep them in a safe place and water them daily. After 7 to 10 days observe their growth [Fig. 1.3(b)].



Fig. 1.3 (a) : Preparation of the experiment

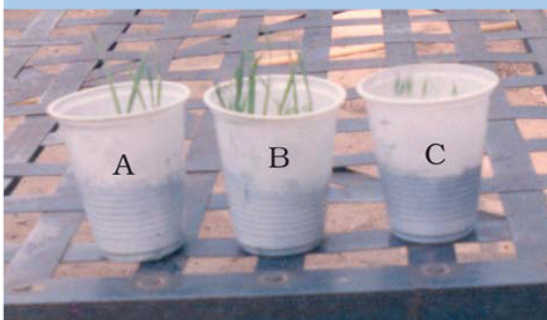


Fig. 1.3 (b) : Growing seedlings with manure and fertiliser

Did all the plants in all the glasses grow at the same pace? Which glass

showed better growth of plants? In which glass was the growth fastest?

Fertilisers are chemical substances which are rich in a particular nutrient. How are these different from manure? Fertilisers are produced in factories. Some examples of fertilisers are— urea, ammonium sulphate, super phosphate, potash, NPK (Nitrogen, Phosphorus, Potassium).

The use of fertilisers has helped farmers to get better yield of crops such as wheat, paddy and maize. But excessive use of fertilisers has made the soil less fertile. Fertilisers have also become a source of water pollution. Therefore, in order to maintain the fertility of the soil, we have to substitute fertilisers by organic manure or leave the field uncultivated (fallow) in between two crops.

The use of manure improves soil texture as well as its water retaining capacity. It replenishes the soil with all the nutrients.

Another method of replenishing the soil with nutrients is through crop rotation. This can be done by growing different crops alternately. Earlier, farmers in northern India used to grow legumes as fodder in one season and wheat in the next season. This helped in the replenishment of the soil with nitrogen. Farmers are being encouraged to adopt this practice.

In the previous classes, you have learnt about *Rhizobium* bacteria. These are present in the nodules of the roots of leguminous plants. They fix atmospheric nitrogen.

Table 1.1 : Differences between Fertiliser and Manure

S. No.	Fertiliser	Manure
1.	A fertiliser is an inorganic salt.	Manure is a natural substance obtained by the decomposition of cattle dung, human waste and plant residues.
2.	A fertiliser is prepared in factories.	Manure can be prepared in the fields.
3.	A fertiliser does not provide any humus to the soil.	Manure provides a lot of humus to the soil.
4.	Fertilisers are very rich in plant nutrients like nitrogen, phosphorus and potassium.	Manure is relatively less rich in plant nutrients.

Table 1.1 gives the differences between a fertiliser and manure.

Advantages of Manure : The organic manure is considered better than fertilisers. This is because

- it enhances the water holding capacity of the soil.
- it makes the soil porous due to which exchange of gases becomes easy.
- it increases the number of friendly microbes.
- it improves the texture of the soil.

1.6 Irrigation

All living beings need water to live. Water is important for proper growth and development of flowers, fruits and seeds of plants. Water is absorbed by the plant roots. Along with water, minerals and fertilisers are also absorbed. Plants contain nearly 90% water. Water is essential because germination of seeds does not take place under dry conditions. Nutrients dissolved in water get transported to

each part of the plant. Water also protects the crop from both frost and hot air currents. To maintain the moisture of the soil for healthy crop growth, fields have to be watered regularly.

The supply of water to crops at different intervals is called **irrigation**. The time and frequency of irrigation varies from crop to crop, soil to soil and season to season. In summer, the frequency of watering is higher. Why is it so? Could it be due to the increased rate of evaporation of water from the soil and the leaves?

I am very careful this year about watering the plants. Last summer my plants dried up and died.



Sources of irrigation : The sources of irrigation are— wells, tubewells, ponds, lakes, rivers, dams and canals.