

The principles of Crop Production

Development of vegetative Parts and Flowering

The Five part

The second stage of plant growth, following germination and the establishment of the young seedling, is the development of the vegetative parts, which comprise the rooting system in the soil and the stems and the leaves above the surface. The materials necessary for growth are obtained partly by absorption through the root hairs in the soil, and partly from the materials made in the green leaves. The conditions necessary for growth to take place in a satisfactory manner are complex in character and include the soil and its constituents, which are to some extent under the control of the farmer, and the presence above ground of air and light, matters over which the farmer has little or no control.

The most important of the factors affecting plant growth is the supply of water. A growing plant contains at least 80 per cent of water, and it is the water contained in the soft parts of the plant, such as the leaves, which keeps them in a firm and fresh condition. A shortage of water leads almost at once to a plant wilting and becoming soft and limp. Water is also the medium by which the roots absorb plant nutrients. The solution of salts to be absorbed is very weak, and when the plant has extracted the nutrients from the solution, there remains a far greater quantity of water than is needed to keep the tissues in their shape. The excess water has to be disposed of, and it passes out to the atmosphere through small openings found mainly on the underside of the leaves.

The process of the movement of water from the leaves to the air is known as transpiration. A growing crop removes very large quantities of water from the soil in the course of the season.

Another factor essential to plant growth is a supply of air from which the plant can obtain oxygen. As with most living organisms, a plant cannot exist without oxygen, which is taken in and used in the breaking down of carbohydrates to provide the energy required for life. This breakdown results in the formation in the plant of carbon dioxide, which passes out to the atmosphere. The process is known as respiration, and may be simply defined as the process of breathing in oxygen and breathing out carbon dioxide. If there is a shortage of air in the soil, the roots do not obtain sufficient oxygen and plant growth is stunted, and in extreme cases the plant will die. The most likely cause of a shortage of air in the soil is the presence of too much water, so that the soil is waterlogged, thus good drainage in the soil is essential for plant growth.