Soil and other growing media

Growing media

Plants need a growing medium to provide them with:

- air for root respiration;
- sufficient water;
- sufficient nutrients.

They also need anchorage to stop them being blown or carried away.

Figure 1 The growing medium for these tomato plants is compost specially formulated to ensure healthy growth and good yields.

Soil

Soil is the most common growing medium for plants. Soil is a mixture of solid particles (mineral and organic material), water and air.

Figure 2 Oil seed rape is used to make vegetable oil for the food industry. It is also being used increasingly to make biodiesel. Like all crops grown in very large quantities, it is grown in soil.

- Minerals are inorganic. Mineral particles in soil are formed by the break-up of much larger rocks by physical, chemical and biological weathering.

  This process has happened over millions of years.

- Organic material is made when dead organisms such as plants and animals decompose and decay.
- The space between solid particles is filled with water which had a number of solutes dissolved in it. There are also pockets of air trapped in the water.

Compost

Compost is a growing medium used in greenhouses for:

- germinating seeds;
- growing plants.

It is also used for indoor (household) plants. There are many different types of compost. Each is made by mixing different components according to a known formulation.

Figure 3 Plants grown indoors, in greenhouses for example, are grown in compost. Often the compost is formulated to suit the plant being grown.

Sometimes the term ‘compost’ is used to describe the product of organic waste when it rots and decays. This usually happens in a compost heap. Some growers say it may be better to call composts that plants are grown in ‘growing media’ and use the term compost to mean only the product of organic waste decay.

Water (hydroponic cultivation)

Some plants are grown commercially in water rather than soil or compost, but it is not common at the moment. There are advantages and disadvantages[1] to hydroponic cultivation compared to using soil or composts.

Advantages

- Less space, shorter growing time, higher yields and greater control have been claimed.

Disadvantages

- However, set-up costs are high, diseases and pests can easily affect each plant (though controlling this is easier) and plants react quicker to changes in the environment.

Figure 4 Hydroponic cultivation can be used to grow cucumbers in water.

Finding out

John Innes composts have been used by growers for over 60 years. They are 'soil-based' composts.

1. What are the ingredients used to make John Innes composts?
2. Which ingredients are inorganic, which are organic and which are mixtures?
3. Describes how and why the compositions of John Innes composts vary.
4. Find examples of soil-less composts and say what their advantages and disadvantages are over soil-based composts such as John Innes.

The John Innes website is http://www.johninnes.info/index.htm

1 http://www.hydroponicsearch.com/Explore_the_Science_of_Hydroponics/Hydroponics_cultivation_methods/Hydroponics:_Advantages_&_Disadvantages/