

INTRODUCTION TO FERTILIZER

Fertilizer is generally defined as "any material, organic or inorganic, natural or synthetic, which supplies one or more of the chemical elements required for the plant growth". Sixteen elements listed in Table 1.1 are identified as essential elements for plant growth, of which nine are required in macro quantities and seven in micro quantities.

Of the elements listed in Table 1.1, carbon, oxygen and hydrogen are supplied by air and water and are, therefore, not treated as nutrients by the fertilizer industry. The main aim of the industry is to provide the primary and secondary nutrients which are required in macro quantities.

Table 1.1 - Essential elements for plant growth

No.	Name of element	Nomenclature
1.	Carbon	
2.	Oxygen	
3.	Hydrogen	
4.	Nitrogen	
5.	Phosphorus	Primary nutrients
6.	Potassium	
7.	Calcium	
8.	Magnesium	Secondary nutrients
9.	Sulphur	
10.	Boron	

11.	Chlorine	
12.	Copper	
13.	Iron	Micro nutrients
14.	Manganese	
15.	Molybdenum	
16.	Zinc	

Note: As per the Fertiliser Control Order (FCO) 'fertiliser' means any substance used or intended to be used as a fertiliser of the soil and/ or crop and specified in part A of Schedule I and includes a mixture of fertilisers and special mixture of fertilisers.

Primary nutrients are normally supplied through chemical fertilisers. They are chemical compounds containing one or more of the primary nutrients and are generally produced by chemical reactions. Whatever may be the chemical compounds, its most important ingredient for plant growth is the nutrient content.

The primary nutrients are nitrogen, phosphorus and potassium; however, their concentration in a chemical fertiliser is expressed as a percentage of total nitrogen (N), available phosphate (P_2O_5) and soluble (K_2O). Thus, ammonium sulphate contains 20.6 per cent N; single superphosphate 16 per cent P_2O_5 and muriate of potash 60 per cent K_2O .

The grade of a fertiliser is expressed as a set of three numbers in the order of per cent N, P_2O_5 and K_2O . If a nutrient is missing in a fertiliser, it is represented by a zero. Thus ammonium sulphate is represented as 20.6-0-0 (since it does not contain phosphorus and potassium), single superphosphate as 0-16-0 (as it does not contain nitrogen and potash), muriate of potash as 0-0-60 (as it does not contain nitrogen or phosphorus). When a fertiliser contains more than one nutrient, for example diammonium phosphate, it is shown as 18-46-0, indicating that it contains 18 per cent of nitrogen, 46 per cent of P_2O_5 and no potash. Similarly, "Suphala", a nitrophosphate fertiliser produced by RCF, Trombay, is shown as 15-15-15 indicating that the product contains 15 per cent N, 15 per cent P_2O_5 and 15 per cent K_2O .