



# SOIL PH & SALT CONTENT

HOW DO THEY AFFECT YOUR PLANTS?

## What is pH?

pH is a measure of the acidity or alkalinity of soil or water. The pH scale ranges from 0 -14 with pH 7 as the neutral value. A pH value less than 7 indicates an acidic condition while that above 7 indicates an alkaline condition for soil or water.

## pH and nutrient availability

Plants vary in their reaction to soil pH. Generally plants grow well in soils having a pH range of 5.5 to 7.0. Plant nutrient availability is restricted when pH is outside this range. The tropical soils are generally found to have an acidic range. In these soils, Phosphorus, Potassium, Magnesium and Calcium are low while Aluminum and Iron are found in higher amounts. In highly acidic soils Aluminum and Iron content may reach toxic levels.

## Why is pH important?

- Affects nutrient availability – causes nutrient deficiency or toxicity.
- Very high or very low pH – causes direct damage to the roots.

## Correcting soil pH

- Low soil pH can be corrected by application of lime. Calcium carbonate, Calcium oxide and dolomite are some liming materials available in the market.
- High soil pH can be corrected by addition of organic matter, humic acids and Sulphur.

## What is salt content?

The term salt as applied to Horticulture, refers to the total salt content resulting from the accumulation of Sodium, Chloride, Sulphate, Potassium, Calcium and Magnesium in soil.

## Effects of excessive salts in soil on plants

- Scorched plants with leaf edge burns. In severe cases, the plants may dry up and even die.
- It affects microbial activities and soil properties.
- The tolerance of plants to salts varies with species. In general, an electrical conductivity of lower than 2mS/cm is acceptable for most plant growth.

## Ways to improve soils high in salt content

- Leaching the soil with water helps to drain away excess salts.
- If the soil is too high in sodium salts, calcium sulphate may be applied followed by leaching with water.

## Steps to avoid salt build up in soil

- Practice judicious fertilizer application.
- Always check the salinity of any new planting media considered for use. For example, sand can be quite saline.
- Certain composts and poultry manure are usually quite salty. Their use must be such that the overall salt level of the soil is not affected.



# A GUIDE TO PLANT FERTILISERS & USE

Soils in the tropics are generally low in essential elements necessary for plant growth. Fertilisers are applied to the soil to increase fertility so that plants can grow vigorously and reproduce.

## FERTILISER TYPES

Fertilisers are of 2 types– Organic and Inorganic.

Organic fertilizers are from decaying plant and animal matter and are made after processing or used as such.

Eg. Compost, plant extracts, seaweed, chicken manure, bone and blood meal.

Inorganic fertilisers are from minerals of the earth's crust or made by chemical processes.





Eg. Urea, Ammonium sulphate, Super phosphate, Potassium chloride, Compound fertilisers

## ESSENTIAL NUTRIENTS

Plants obtain carbon, hydrogen and oxygen from water, air and sunlight to make food for growth. Nitrogen (N), Phosphorus (P), Potassium (K), Sulphur (S), Calcium (Ca) and Magnesium (Mg) are macronutrients required by plants in relatively large amounts.

Other elements that are required by the plants in minimum quantities but are essential for normal growth are called as "trace" or "minor" elements or "micronutrients. Examples are Copper (Cu), Manganese (Mn), Zinc (Zn), Iron (Fe), Boron (B) and Molybdenum (Mo).

## MAJOR NUTRIENTS IN FERTILISERS

	NITROGEN (N)	PHOSPHORUS (P)	POTASSIUM (K)	MAGNESIUM (Mg)
FUNCTIONS	<ul style="list-style-type: none"> <li>Promotes vegetative growth and production of lush foliage</li> </ul>	<ul style="list-style-type: none"> <li>Promotes the formation of lateral and fibrous roots</li> <li>Promotes flowering</li> </ul>	<ul style="list-style-type: none"> <li>Promotes formation and enlargement of fruits</li> <li>Increases disease resistance</li> </ul>	<ul style="list-style-type: none"> <li>Structural part of chlorophyll</li> <li>Necessary for the functioning of plant enzymes</li> </ul>
DEFICIENCY	<ul style="list-style-type: none"> <li>Leaves turn pale yellow (chlorotic)</li> <li>Poor, stunted growth</li> </ul>	<ul style="list-style-type: none"> <li>Occur first in lower leaves</li> <li>Underside of leaves turn reddish brown or purplish</li> </ul>	<ul style="list-style-type: none"> <li>Older leaves develops brown or yellow scorching at the edges and tips of leaves</li> </ul>	<ul style="list-style-type: none"> <li>Yellowing of older leaves between leaf veins (Interveinal chlorosis)</li> </ul>
SYMPTOMS				

## RECOMMENDATIONS FOR USE

The application of fertilizers is to amend soil fertility problems or to enhance fertility for better plant growth. A balanced and complete fertiliser is desired. Therefore the amount and type of fertilizers needed to be applied depend on soil condition and the plant type.

N

Mn

Fe

S

P

Ca

Mg

B

Cu

K

Zn