

Liming of Soil

Soil in this humid tropical region requires liming because of long-term exposure to leaching process, which lead to natural acidification of mineral soil. Shortage of fertile land, lead to reclamation of acid sulphate soils for cultivation that requires intensive liming programme before the land becomes productive. The intensive use of chemical fertiliser also leads to acidification of the soil, which require liming to overcome the problem.

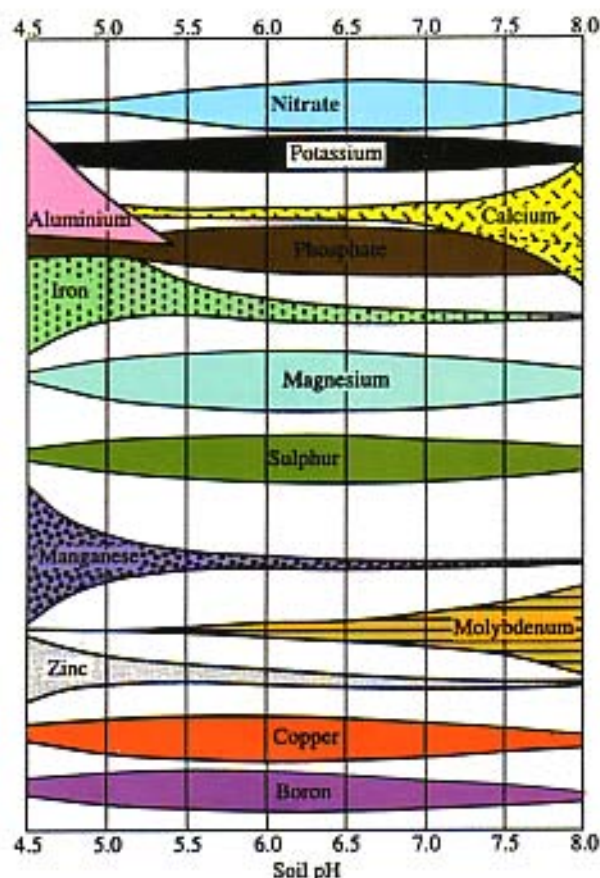
First step of soil fertility improvement programmes before fertilisation should be started with liming the soil to pH 5.5 – 6.5, which is the optimum pH for general plant growth.

BENEFITS OF LIMING

Main benefits of liming are:-

1. To neutralise exchangeable aluminium (Al^{3+}) which become dominant in the soil with pH <5.0 - 5.5 which is harmful to plant root system and aim to reduce manganese (Mn) toxicity

FIGURE 1: INFLUENCE OF pH ON PLANT NUTRIENT AVAILABILITY



at pH < 5.5.

2. To improve soil nutrient availability (Figure 1) and provide favourable soil environment for the uptake of balance nutrient by the plant root system.
3. Liming materials such as calcite ($CaCO_3$) increases calcium and dolomite [$CaMg(CaCO_3)_2$] increases both calcium and magnesium reserve in the soil.
4. Liming also improves the fine-textured soil by flocculation of Ca-saturated clay.

RATE

Approximate amount of lime ($CaCO_3$) required to raise 1 unit pH is 2 tonne/ha. The requirements of lime according to soil texture are:

TEXTURE	RATE OF LIME (Tonne/ha)
Sand	1
Sandy Loam	1.5
Loam soil	3
Clay soil	4
Peat soil	4

TYPES OF LIMING MATERIALS

MATERIAL	Neutralising value
Calcite ($CaCO_3$)	100
Dolomite [$CaMg(CaCO_3)_2$]	109
Hydrated Lime [$Ca(OH)_2$]	136
Burned Lime (CaO)	179

Liming materials that are commonly used in this country are calcite and dolomite. Recommendation on type of material use depends on the nutrient content of the soil test. Soil with low calcium content is recommended to be lime with calcite and soil with low magnesium content is recommended with dolomite.

METHOD OF APPLICATION

Liming is required when the pH < 5.5. For effective reaction of liming material with soil, lime should be incorporated into the soil during land preparation. For crops rotated with legumes, lime should be applied 3- 6 months before seeding. For mature fruit trees, lime should be broadcasted around the area under the tree canopy.

It is important to maintain optimum pH of the soil throughout the year. Liming can be done every year or it depends on soil pH test result, which is recommended to taken every two years.