Soil FACTSHEET

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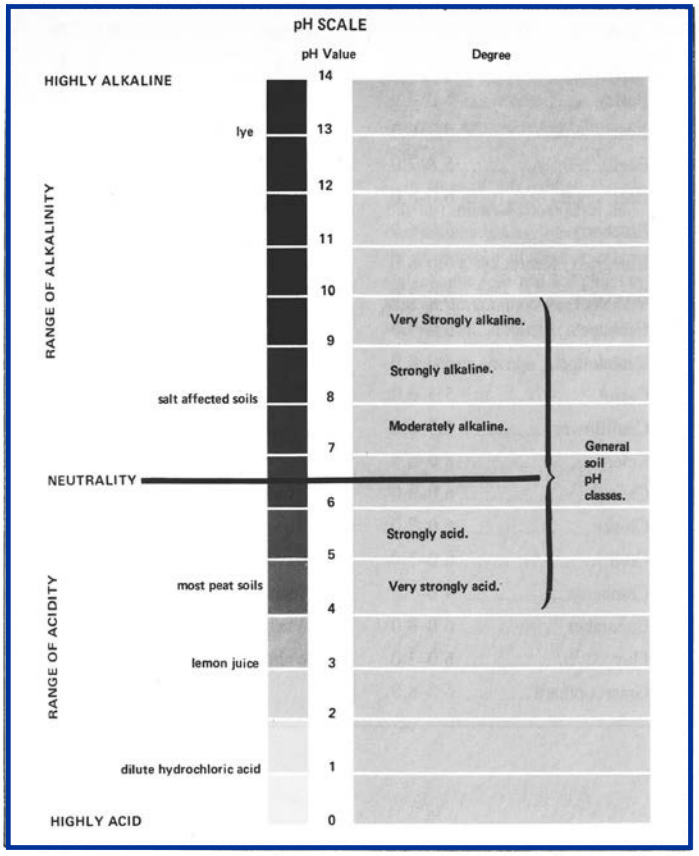
Soil pH

WHAT IS SOIL pH?

Soil pH refers to the degree of acidity or alkalinity of the soil. Figure 1, the pH scale, shows how pH numbers relate to acidity or alkalinity. The scale ranges from 1 to 14, pH 7.0 being the neutral point. A reading below 7.0 indicates the degree of acidity; a reading above pH 7.0 indicates the degree of alkalinity.

Soil pH is normally determined on all agricultural soil samples sent to soil testing laboratories.

Materials are available that when applied to the soil will change the pH to a point more favourable for crop production. These materials are referred to as soil amendments.



SOIL pH PREFERENCE OF CROPS

Most crops will grow under a wider range of soil pH than is indicated by their preference. Table 1 indicates the typical pH ranges preferred by many crops grown in British Columbia. Crops may tolerate pH values outside of these ranges. The addition of a soil amendment which changes the soil reaction to a more favourable range for a specific crop will result in better production, providing other good soil management practices are followed.

Lime or lime compounds (ground limestone, marl, hydrated lime) are the soil amendments used to raise the pH or reduce the acidity of the soil. Sulphur is used to lower pH or increase the acidity of the soil. In cases of extreme soil pH, response will not be great from the application of plant nutrients until an amendment has changed the pH more closely to that preferred by the plant.

In areas of high total rainfall (Lower Fraser Valley and Vancouver Island), elements such as calcium and magnesium tend to be washed from the soil resulting in an acid soil. The use of lime on such soils replaces the lost calcium and raises the pH to a range preferred by the crop being grown. Before applying lime, the soil should be tested to determine approximately how much will be required.

In areas of low rainfall (South Central Interior), mineral compounds may become concentrated in large quantities, leading to the development of alkaline soils and saline soils. Saline soils and soils high in sodium salts are not common, but have very serious management problems when they occur.

Figure 1 pH SCALE

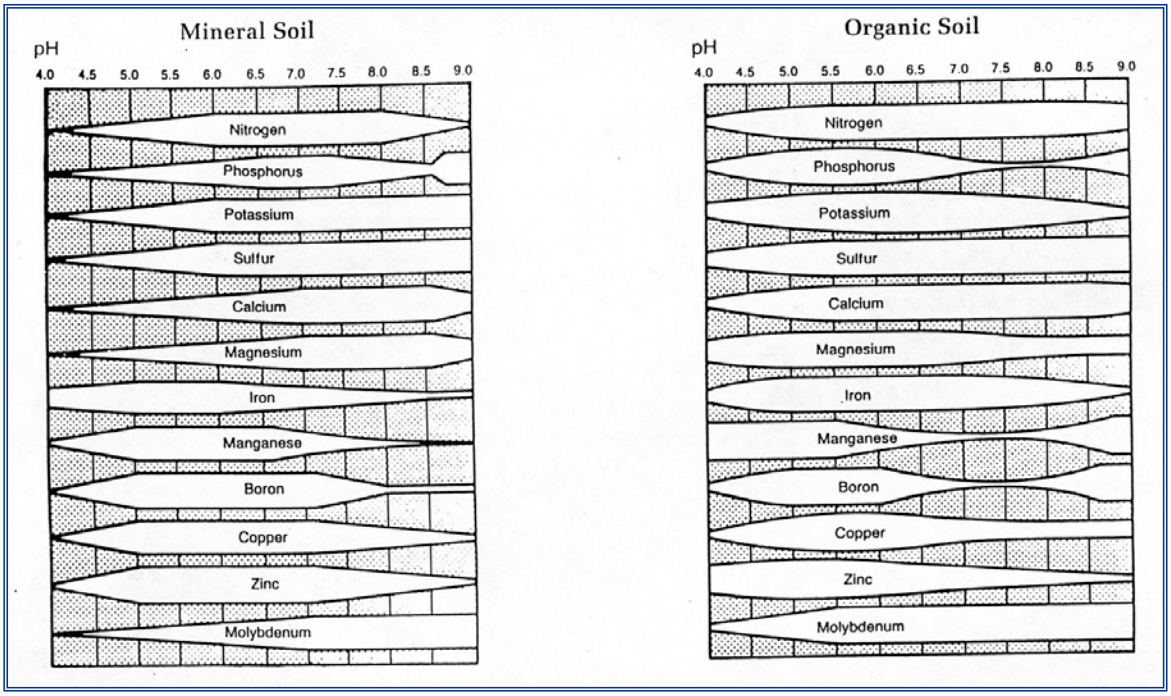
Table 1 SOIL pH PREFERENCE OF VARIOUS CROPS

Berries (*Vaccinium*): Blueberry (Highbush), Cranberry	4.5-5.5
Berries (Other): Strawberry, Raspberry	5.5-6.5
Cereal Grains: Barley, Wheat, Oats	5.8-6.5
Cole Crops: Broccoli, Cabbage	6.0-7.0
Corn (silage):	5.5-7.5
Grass for Seed or Pastures	5.5-8.2
Legumes: Alfalfa, Sweet Clover	6.5-7.5
Other Legumes: Crimson Clover, Peas, Vetch	5.5-7.0
Tree Fruits (Apple, Sweet Cherry, Pears) and Grapes	5.5-7.0
Hops:	5.7-7.0
Vegetables (General):	6.5-8.0
Asparagus	6.5-8.0
Broccoli, Cabbage	6.0-7.0
Beans, Peas	6.0-7.0
Potato	5.0-6.5

Crops may tolerate soil pH outside of the above ranges.

SOIL pH INFLUENCE ON AVAILABILITY OF NUTRIENTS

Another very important effect of soil pH is in relation to the availability of plant nutrients. The pH of the soil solution governs the solubility and therefore the availability of plant nutrients. The element may be present in the soil in relatively large amounts but due to the unfavourable pH is "tied up" or unavailable. Figure 2 illustrates the relationships established between pH and the availability of the various plant nutrients elements considering both direct and indirect effects. Each element is represented by a band as labelled. The width of the band at any particular pH value indicates the relative favourability of this pH value to the presence of the elements in readily available forms; the wider the band, the more favourable the influence.



FOR FURTHER INFORMATION CONTACT
Phone: 604.556.3001
Toll Free: 1.888.221.7141

MINISTRY OF AGRICULTURE
1767 Angus Campbell Road
Abbotsford, B.C. V3G 2M3