Soil Acidity

Fact Sheet No. 3
June 2008

Soil acidity can seriously degrade pasture performance by stressing grasses and reducing the availability of essential minerals. Problem acid soils will have a pH below 5.6 and seriously affected soils a ph below 5.0.

pH is a measure of the acidity and alkalinity of the soil using a scale from 1 to 14; where 7 is neutral, less than 7 is acid and greater than 7 is alkaline. Fresh, clean water is neutral with a pH of 7, lemon juice is very acid with a pH of 2.6 and baking soda is very alkaline with a pH of 8.5. It is important to remember that pH is a logarithmic scale, so the difference between a pH of 7 and a pH of 6 is ten times the acidity, between 7 and 5 is a 100 times the acidity and between 7 and 4 is a 1000 times the acidity so it is obvious that this will have a major impact on the ability of plants to grow.

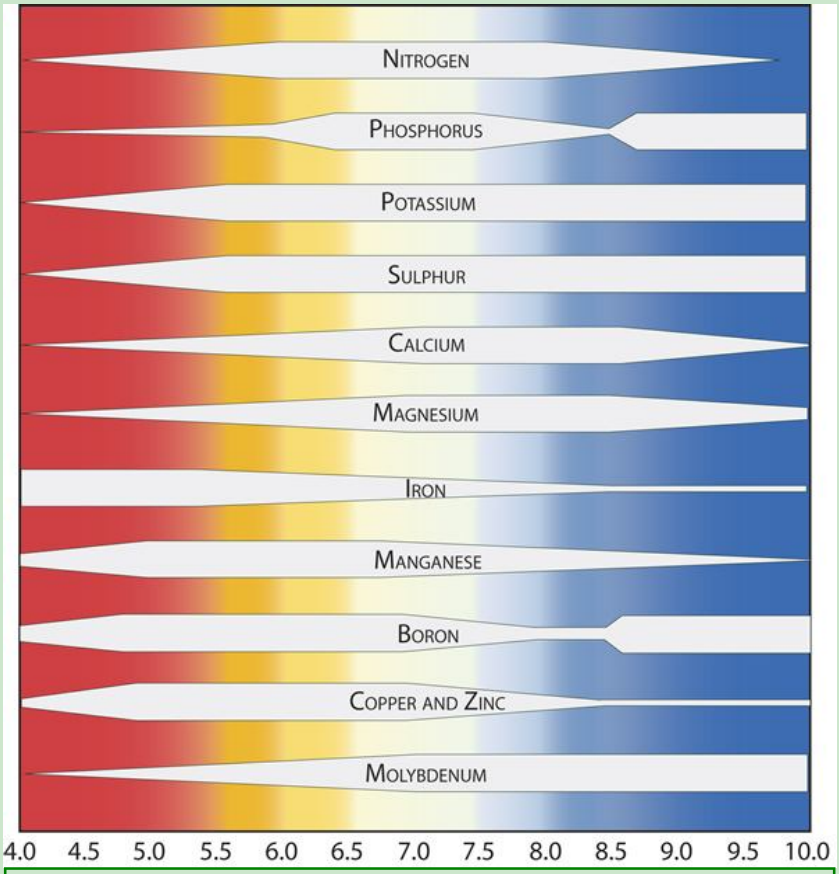

Diagram showing pH effect on the availability of minerals, ***particularly note the impact on phosphorus.***

The diagram beside show the impact of soil pH on the availability of nutrients and minerals important to growing healthy pasture and probably delivering a quality milk product. Additionally pH levels can have an enormous impact on soil ecology. This ecology like worms and root borne bacteria are extremely important to processing of nutrients (even nitrogen) into a form useable by grass.

Plant nutrient availability varies quite dramatically with soil pH. In very acid soils all the major plant nutrients (nitrogen (N), phosphorous (P), potassium (K), sulfur (S), calcium (Ca) and manganese (Mg)) and also trace element molybdenum (Mo), may be unavailable to plants, or only available in limited quantities.

Soil Acidity

Compensating Fertilizer

Soil acidity causes a reduced response from pasture to fertilizer applications. Often time higher applications are required to achieve a reasonable response from that grass. This is the effect of the pH locking away the essential minerals. Urea fertilizers also have the effect of lowering pH levels . This can have a compounding effect, more nitrogen needed to compensate lower pH, lower pH caused by that nitrogen, even more nitrogen needed to compensate that effect and so on.

Optimum pH?

The basic soil geology and chemistry of any area is very variable. Many Heytesbury soils would be naturally acidic. Generally a maintained target range between 6.0 and 7.0 would be ideal but above 5.6 will be manageable. Soils with pH below 5.0 should be attended to promptly as they are costing productivity.

Raising pH

The addition of agricultural lime (calcium carbonate) or dolomite (magnesium carbonate & calcium carbonate) will increase pH (decrease acidity) of the soil. Agricultural lime is cheaper to buy than dolomite. Dolomite is only a good idea if your soil is deficient in magnesium.

Symptoms of Soil Acidity

- Deficiency of production nutrients like nitrogen, phosphorus, potassium, molybdenum and sulphur
- Aluminium toxicity
- Manganese toxicity
- Legume loss or failure
- Increase in plant disease
- Calcium and magnesium deficiency
- Root growth poor, with stubby roots and few fine roots.
- Pasture growth / crop yields are poor even in good seasons.

Key Messages:

- Regularly conduct soil test for pH and monitor problem soils
- Some soil types are naturally more acidic than others
- Low soil pH (below 5.0) should be corrected urgently
- Important nutrients and minerals can be severely altered by acidic soil..

Heytesbury District Landcare Network

PO Box 69 Timboon Vic 3268 Phone: 5598 3755
Website: www.heytesburylandcare.org.au

CARING FOR OUR COUNTRY