

Are my soils acid?

TABLE

The sensitivity of some commonly grown crops¹ and pastures² to soil acidity.

Highly sensitive	Durum wheat, Schooner and Yerong barley, faba beans, chickpeas, lucerne, medics, strawberry, Balansa, Berseem and Persian clovers, Buffel grass, tall wheatgrass
Sensitive	Canola, Rosella and Janz wheat, O'Conner and Skiff barley, albus lupins, red grass (Wagga), wallaby grass (D.Linkii) phalaris, red clover, Caucasian and Kenya white clovers
Tolerant	Brindabella barley, Swift and Sunstar wheat, Diamondbird is the most tolerant wheat, annual and perennial ryegrass, tall fescue, Haifa white and subterranean clovers
Highly tolerant	Narrow leaf lupins, oats, Tahara triticale, cereal rye, cocksfoot, kikuyu, paspalum, yellow and slender serradella, Maku lotus common couch, Consul love grass.

1. See the Winter cereal sowing guide published annually by NSW Agriculture for the current a list of crop tolerance to acid soils.
2. See ASA Leaflet No 6 Pastures and Acid Soils for more information.

ACID SOILS

You may suspect that your soils are acid if:

- you are having trouble establishing acid-sensitive crops or pastures (see table),
- you have low yielding patches in acid-sensitive crops,
- sown pastures are patchy, will not persist or perform poorly,
- most of your neighbours are concerned about soil acidity.

You will know that your soils are acid if you have a soil test that shows that the pH in calcium chloride is less than 4.8 - that is less than 5.5pH in water - and the exchangeable aluminium is above 5 per cent.

A laboratory test is the most accurate measurement of soil acidity. Always check the pH and exchangeable aluminium percentage on any soil test result.

Attending local field days, as well as keeping in touch with your local farm advisers, will alert you if other farmers in the district are concerned about soil acidity.

It is likely most of the soils around you are acid if you do not have any acid sensitive crops or pastures growing in your district (see table). The

productivity of your district would be based on plants that can tolerate acid soils. A soil test will confirm this assumption and ensure that your planning is based on the best available information.

HOW DO I GET MY SOIL TESTED?

The results of a soil test are only as good as the sample of the paddock that you collect. You need at least 35 soil cores - 10cm deep - from all over the paddock. Avoid sheep and cattle camps, shade trees, gateways and obviously different soils that are less than 10 per cent of the paddock.

Mix the cores together to make one sample, reduce the sample to about 300gm and send it to an accredited Australian laboratory.

In southern NSW soil samples are normally taken as soon after the autumn break as possible. Recommendations for managing acid soils are therefore based on samples taken at this time. If you are comparing results from a winter/spring sampling to those from an early autumn sampling, then allow for the winter samples to be about 0.2 pH units less.

Elsewhere in NSW do not sample when the soil is very wet or very dry, or immediately after an unseasonable dry spell. Wait at least six months after applying fertiliser before sampling in pastures.



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More often than not if the tests show that the 0-10 cm sample is acid then you will need to know the pH of the 10-20cm layer before planning a liming program. If you expect your soils to be acid, you should collect the 10-20cm sample at the same time as the 0-10cm sample.

All Australian soil testing laboratories have a range of soil test packages. Select an appropriate, comprehensive, soil test for the 0-10 cm sample.

For the 10-20 cm sample a cheaper less comprehensive test, that measures only the pH and "exchangeable cations", is all that is required. Testing for micro nutrients is of little value as results cannot be interpreted with confidence.

Always discuss your results with a qualified agronomist or soil chemist. If you intend to monitor the soil pH and fertility of a paddock over time, collect the samples from a representative part of the paddock - about 20 per cent of total area - and return to this same place for future sampling.

DIYS SOIL PH TESTING KITS

Most do-it-yourself soil testing kits only give a guide to soil acidity. Again the result is only as accurate as the sample you take. So sample the paddock as described above - or take at least six cores at any one site.

The Raupach kit is the most reliable. It was developed by the CSIRO and uses the white powder and indicator solution. The reading it gives is a water pH that can be converted roughly to the calcium chloride scale by subtracting 0.8 from the result.

Using a hand held pH electrode in a 1-to-5 soil to calcium chloride mixture, is more accurate than the Raupack kit. These electrodes quickly lose their accuracy if not cared for properly.

Before making management decisions that could prove costly, have a properly collected sample analysed by an accredited laboratory and interpreted by a qualified agronomist.



LIME TEST STRIPS

Test strips of lime will indicate if a soil is acid. To ensure a meaningful result:

- leave an unlimed strip next to the limed strip,
- sow an acid-sensitive plant,
- allow two to three years to ensure a result,
- correct other problems such as low phosphorus that may over ride the lime effect,
- for crops, harvest and weigh the limed and unlimed strips separately,
- lock up pastures 4 to 8 weeks before cutting and weighing samples from the lime and no lime strips.

DISCLAIMER: The information contained in this publication is based on knowledge and understanding at the time of writing (July 1999). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Agriculture or the user's independent adviser.



This pamphlet is one of a series on Acid Soil Management prepared for the New South Wales Acid Soil Action Program. It was written by Greg Fenton, Project Coordinator, Acid Soil Action, Wagga Wagga Agricultural Institute.