

## fact sheet 4. Soil

Leucaena will grow in a wide range of soils but is most productive in fertile (high phosphorus and alkaline pH), deep (>1 m), well-drained soils (intolerant to waterlogging).

Leucaena performs best in soils with high phosphorus and sulfur, and good levels of trace elements particularly potassium and zinc.

It's imperative to soil test paddocks selected for leucaena production prior to sowing to ensure adequate soil nutrient supply and soil depth. Soil testing can determine the suitability of a paddock for leucaena and so assist with paddock selection.

### Why Soil Test

Soil testing enables an assessment of the chemical, physical and biological aspects of your soil. This can provide insight into the capacity of your soil to support the successful establishment and long-term sustainability of leucaena, and deliver productive yields, high fertiliser and water efficiencies, livestock performance and profit.

Soil testing can answer the following questions:

- What is the nutritional status of my soil? Do plant nutrient deficiencies or toxicities occur?
- What is the effective root depth of my soil?
- What chemical or physical properties are causing underperformance or affecting yield and limiting my production?
- What physical or chemical soil imbalances are present, and what are the relationships between each component?

### How to Soil Test

It's advisable to seek advisor assistance as this makes collecting multiple, representative, soil cores over a paddock to a depth of about 1 metre much easier. Collect at least 10-15 soil core samples (depending on paddock size and number of soil types) and break into increments of 0-10cm, 10-30cm, 30-90cm. Bulk each increment from each core together, break-up and thoroughly mix, then subsample about 500g of soil into a labelled bag.

Whilst undertaking your soil testing, it is imperative that the condition of the soil, the depth of usable soil and the structure of the subsoil is noted. This may indicate physical impediments to root depth or soil degradation such as soil compaction, which potentially could require mechanical intervention to solve.

## **Interpreting your Soil Test**

Your agronomy advisor will be able to assist you with a complete interpretation of the soil test. However the most important aspects are:

### ***pH***

Soil pH is measured on a scale from 0 (strongly acidic) to 14 (strongly alkaline), with 7 being neutral. Leucaena prefers soil with neutral to alkaline pH, and pH of 5.5 is the lower tolerance limit. It's also important to measure the subsoil pH as this will influence root depth and hence nutrient and water extraction.

### ***Phosphorus***

Phosphorus is an important soil nutrient for legumes. Leucaena has a higher requirement for phosphorus compared to other legumes, with a critical value (Bicarb or Colwell) in the 0-10cm soil layer of greater than 20mg/kg. Phosphorus is largely immobile in most soils, and is concentrated in the top (0-30cm) part of the soil profile.

### ***Sulfur***

Sulfur is another soil nutrient important for legume production. Sulfur is a mobile nutrient so can be found in the deeper part of the subsoil. This means testing in the top and subsoil is required to fully measure the plant availability of sulfur. Leucaena has a moderate requirement for sulfur.

### ***Cation exchange capacity (CEC)***

Cation exchange capacity is a measure of the ability of the soil to hold the cations calcium, magnesium, potassium and sodium. While these are important plant nutrients, they also have a large influence on the structure of the soil. High sodium and magnesium levels in the top soil can cause dispersion and soil crusting reducing seedling establishment, whereas high levels in the subsoil restricts root depth.