



FACT SHEET: Soil Health



North Burnett Flood Recovery

Soil health monitoring

Following the 2013 floods, there has been considerable loss of productivity across the North Burnett with many properties suffering erosion, soil fertility decline, sand and silt deposition from floods, soil acidification, salinity and waterlogging. Therefore, improving soil health will improve land productivity. Understanding your soil and managing its health are key factors to profitable crop production.

Why test soil?

There are many reasons to test soil, such as;

- ✦ Improve management for various agricultural purposes;
- ✦ Identify possible constraints eg. salinity, nutrients
- ✦ Improve soil water available to crops;
- ✦ Monitor soil fertility to improve yield and reduce costs;
- ✦ Assist in identifying chemical, physical or biological amendments to allow for optimal plant growth; and
- ✦ As a diagnostic tool to identify causes of poor plant performance.



Indicators of soil health...

To assess soil health in various cropping systems, there are a number of indicators of soil functions and of paddock performance to consider.

Functions provided by the soil's physical properties and process:

1. Getting water into the soil
2. Storing plant available water in the soil
3. Maintaining a friable structure for root growth and water extraction
4. Remaining aerobic through wet periods
5. Reducing erosion

Functions provided by the soil's chemical properties and process:

6. Supplying nutrients for plant growth;
7. Maintaining pH levels that support plant growth and soil organisms
8. Avoiding toxic levels of nutrients, trace metals and pesticide residues
9. Avoiding excess salinity levels in the soil root zone

Functions provided by soil's biological properties and process:

10. Maintain organic matter to support other chemical, physical and biological functions
11. Biological capacity for nutrient cycling and a resilient physical structure
12. Freedom from damaging populations of pathogens, weeds and other pests

Wheat-North Burnett

More detail can be found in *Assessing soil health-A guide to assessing soil health on your farm*, produced Qld DPI&F, NSW DPI & Healthy Soils.

REMINDER!

Certain cropping practices can have a major impact on soil health also!

Always consider implementing practices on your farm that will maintain and/or improve soil health such as minimum or zero tillage farming and avoid the ones that don't!!

What soil tests are needed?

Soils can be tested for a range of factors; and this can vary depending on your situation. **Soil tests for Crop Nutrition could include:**

- ☛ bicarbonate extractable P (Cowell-P) to assess easily avail soil P
- ☛ acid extractable P (BSES-P) to assess slow release soil P reserves and build-up of fertiliser residues
- ☛ exchangeable K, KCl-40 extractable S or MCP-S, and 2M KCl extractable mineral N, to provide measurement of nitrate-N and ammonium-N (highly influenced by seasonal conditions)

Other factors that may assist would include tests for:

- ☛ soil carbon/organic matter content
- ☛ phosphorus buffering index (PBI)
- ☛ soil salinity measured as electrical conductivity
- ☛ chloride and exchangeable cations including aluminium.

Further detailed information can be obtained from Grains Research & Development Corporation.



Sodic soil -North Burnett

Contact



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Key Nutrients for Crop Production

- ☛ **Nitrogen, phosphorus** and **Potassium** – often lacking due to crops high demand for these nutrients.
- ☛ **Calcium, Magnesium** – can be added by applying lime to acidic soils
- ☛ **Sulphur**—can be added by decomposing organic matter
- ☛ **Boron, Copper, Iron, Chloride, Manganese, Molybdenum** and **Zinc** – all required in smaller amounts

Key things to consider...

Ensure a representative soil core samples are collected.

The more variable the crop growth in the field the more sub samples that are required.

Take separate samples for each soil type.

To obtain comprehensive soil data, including nutrient data, sampling below 10cm should be considered. Examples of tests to be taken at different depths as follows:

- ☛ 0-10cm (pH, N,P,K, S & Salinity)
- ☛ 10-30cm (pH, N,P,K, S & Salinity)
- ☛ 30-60cm(pH, N, S & Salinity)
- ☛ 60-90cm (pH, N, Salinity)
- ☛ 90-120cm optional (pH, N, Salinity)



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