

A NATIONAL PROGRAM TO MONITOR SOIL QUALITY

Key points

- Soil quality is currently being measured in grain-producing areas across Australia.
- This monitoring program and associated website www.soilquality.org.au provide the Australian grains industry with a unique resource on soil quality including soil biology, chemistry and physics.
- Each grower's soil quality information is housed on the soil quality website and workshops provide growers with training to access and interpret this information to support improved soil management.

National Soil Quality Monitoring Program

www.soilquality.org.au provides a unique, interactive resource to the Australian grains industry on soil quality, including soil biology as well as soil chemistry and physics. The web site allows growers to benchmark their paddocks against values for their local catchment and region as well as against expert opinion. This information aids growers to determine if they are heading in the right direction with their systems and practices and supports growers to improve soil management practices.

The Soil Quality Monitoring Program and the web site www.soilquality.org.au are expanding to include grain-producing areas across Australia. This will give growers across Australia access to regionally specific data on soil biological, chemical and physical constraints to production (table 1, figure 1). This will aid the Australian grains industry to make better management decisions.

Benchmarking soil quality

The information on the website is provided in a number of formats including a 'traffic light' snap shot that highlights the main indicators of concern in each catchment and

region (figure 2). The traffic light system is based on expert panel recommendations for critical values of each indicator housed in the web site. Growers can also benchmark their own soil quality results against that of other growers in their catchment and region (figure 3).



Figure 1: Sampling soil for the Soil Quality Monitoring Program

Table 1: A selection of the biological, chemical and physical indicators of soil quality measured as part of the Soil Quality Monitoring Program. The indicators in the monitoring program have clear relationships with soil quality and have the potential to constrain production.

Type of soil property	Soil quality indicator	Relationship to soil quality and production
Biological	Total organic carbon	Plays a key role in nutrient cycling and can improve soil structure
	Microbial biomass	Closely related to nutrient release from crop residues
	Diseases & nematodes	Causes patches of poor growth in a range of crops
	Molecular fingerprinting	A measure of which organisms are present to help unravel the complexity of soil biology
	Potential soil nitrogen supply	Provides an index of the capacity for nitrogen release from soil
Chemical	pH	Affects nutrient availability, microbial activity, aluminium and manganese toxicity
	Cation exchange capacity	Influences soil structure stability, nutrient availability and soil pH
	Nutrients	Essential for plant growth; deficiencies limit yield
Physical	Bulk density	Affects root growth rate, water availability and susceptibility of crops to waterlogging Required to convert soil quality indicators from "per kg" to "per ha"

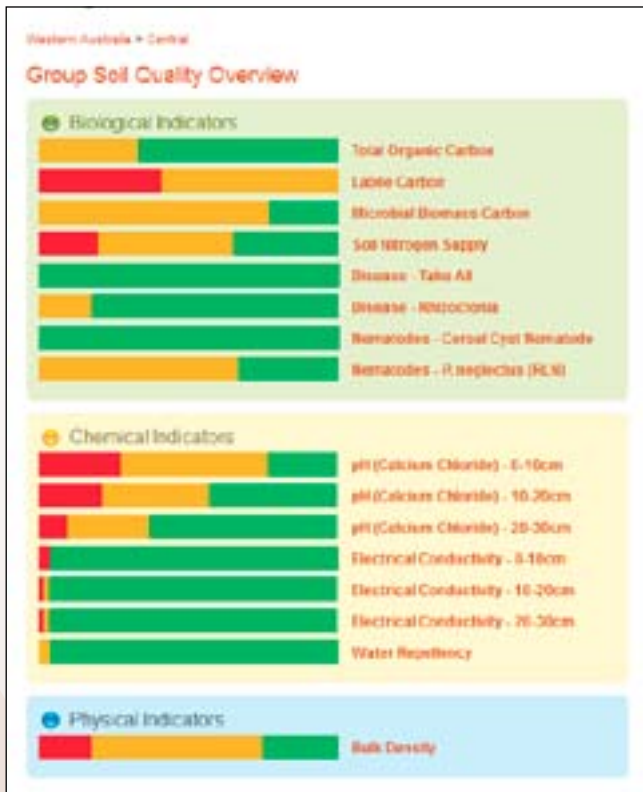


Figure 2: A 'traffic light' snap shot of soil quality in Corrigin, Western Australia. It shows the percentage of farms where indicators of soil quality fall within the categories of red, amber and green.

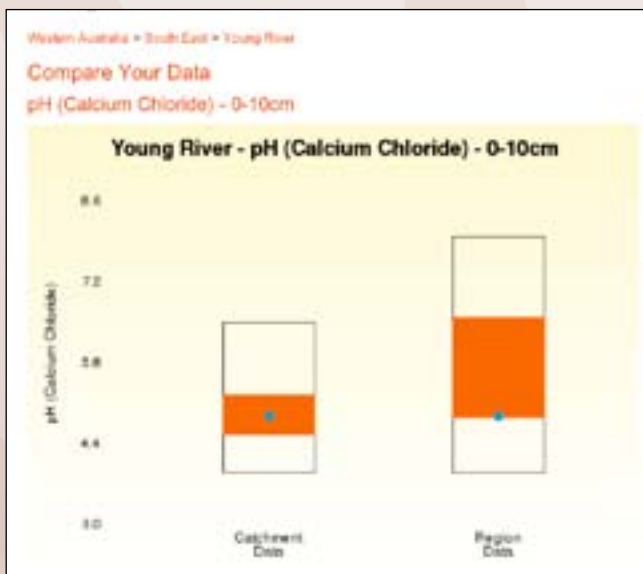


Figure 3: An example of a grower from Young River, Western Australia, benchmarking their own level of the soil quality indicator Soil pH with the range for all sites in their catchment (left) or region (right). The graph compares the grower's value (blue dot) with the range for all sites in the catchment or region (black rectangle) and the range of the middle 50% of sites in the catchment or region (orange box).

Fact sheets and Calculators

The soil quality data on the web site is supported with fact sheets and simple calculators. Fact sheets relate the soil quality indicators to productivity and management options. Simple calculators enable 'what if' scenarios to be tested to highlight management decisions that may improve soil quality.

Demonstrations and Workshops

Soil health workshops enable growers to understand and interpret the data being generated. Computer and web training shows growers how to access and examine their own data via the web site (figure 4). This training empowers growers to make better-informed management decisions with respect to production and longer-term soil sustainability.



Figure 4: Training workshop for growers on monitoring soil quality indicators and use of the web site www.soilquality.org.au

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