



# Resilient Cropping

## Assessing Soil Condition

What is soil quality? How do I assess it? These are two common questions.

Soil quality is a relative measure of fitness for purpose. It is not a fixed, one-answer-fits-all issue. We generally talk of indicators which help build an overall assessment of quality.

What may be acceptable for one farming system may not be suitable for another. In fact, what is good quality in one part of a paddock may be poor in another – think controlled traffic farming, where we deliberately compact wheel tracks, but preserve un-compacted soil in gardens.

## Indicators of soil quality

Soil quality indicators are often broken into three categories: physical, chemical and biological. Most people are familiar with soil fertility testing for nutrient planning. There are many biological indicators, including organic matter content and worm numbers. The physical indicators describe, for example, how well and how strongly the particles are bound together and how easily air and water can move through pores.

Scientists use a range of soil quality tests, many requiring detailed sampling and expensive laboratory testing. Farmers want a cheap and easy alternative. Assessing soil quality can be relatively cheap and easy.

Growers often want to know if soil quality is improving or not. To have real use, a method should be scoreable for recording to compare results between areas and over time.

Managing the quality of the soil resource is a key to profitable and sustainable cropping systems. Visual soil assessment allows growers to benchmark where their soil quality is currently at and offers a structured approach to follow changes in soil quality over time.

## Soil structure

One of the key indicators for cropping soils is soil structure. Structure refers to how soil particles are bound together into aggregates – the lumps we find when we dig soil over.

For best plant growth, well-structured soil has mid-range aggregates which hold together well, even when wet, but can be broken into a seed bed tith.

A poorly structured soil may collapse into individual silt and sand grains or form large, impenetrable lumps.



Figure 1 Understanding soil condition is a step toward better productivity and profit



Figure 2 Counting and recording worm populations is part of the Visual Soil Assessment process



## Visual assessment

Visual assessment of soil condition is a good way to follow change, as paddocks can be monitored and scored each year. The tests must be recorded, so they can be repeated over time, scores compared, and significant changes in soil quality detected. This gives growers the opportunity to monitor how practices like cover cropping, reduced cultivation or controlled traffic improve soil quality.

Two options for simple visual assessment of soil structural condition are the *Visual Soil Assessment (VSA)* tool and the *Structural Condition Score* card. Both involve assessing a spade full of soil.



**Figure 3** Observing uncultivated soil from 1. under a fence 2. in the cultivated part of the paddock and 3. in the wheel track can show the effect of practices on the farm.

## Visual Soil Assessment (VSA) Method

The VSA method has variations for cropping soils and for pastoral soils on flat land or hill country. A simplified version is included in this Fact Sheet series. See “*Visual Soil Assessment – a simplified look*”.

## Further information

For a copy of the VSA booklet and a full description on how to perform a VSA of your paddocks, check the Landcare Research website ([www.landcareresearch.co.nz](http://www.landcareresearch.co.nz)), BioAgrinomics site ([www.bioagrinomics.com](http://www.bioagrinomics.com)) or your regional council.

The structural condition score card is included as part of the wider soil quality management system developed with a focus on cropping soils. For further information contact Plant & Food Research.