

Soil assessment: What value is a number?

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Abstract

Soil and landscape assessment requires detailed interpretation of the soil profile and the chemical, physical and biological properties of the relevant soil horizons within land systems. As state planning becomes more interested in social and economic analysis of development sites with often strict land use restrictions, the ability of decision makers to assess numerical values for soil properties dwindles into irrelevance. Soil testing procedures are being standardised and inter-laboratory proficiency programs such as those by the Australasian Soil and Plant Analysis Council seem to be at odds with requirements by determining authorities and the variety of testing methods starts to be self-defeating.

While good science is based upon accuracy of measurement (what is really there), reproducibility (make the same mistakes over and over) and predictability (know what the numbers mean), it is clear that decision makers want numbers to fall into little boxes that when all filled can be ticked-off as complying with requirements. How those numbers were derived and the level of accuracy becomes secondary to the task of providing a number that appears very precise. Scientists know that inter-laboratory variability is to be expected at varying levels for different tests and within-sample variability can also be high. Scientists also know that sample results depend upon sampling protocols as well as packaging, transportation, storage, and finally sample preparation.

This paper examines a range of soil tests over several proficiency testing programs to show how test methods, soil types, and inter-laboratory variability require more than a cursory guess at what the numbers mean. The paper also highlights the need for fewer tests for everyday site and soil assessment while a different range of tests may be required for research and complex soil environment interactions. We need to recognise that many decisions are based upon generalisations and it is the interpretation of our “best analytical practices” that is advocated rather than stream-lined testing.

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