

Book review

Soil Analysis — An Interpretation Manual

K.I. Peverill, L.A. Sparrow & D.J. Reuter (Eds.). CSIRO Publishing, Collingwood, Vic, 369 pp., 1999. Hardback. ISBN 0 643 06376 5 (A\$94.95)

At the first International Congress of Soil Science in 1924, a strong plea was made to standardise methods of soil analysis as in different countries different procedures were used which hampered exchange of data and ideas. More than 75 years have lapsed but the call for uniform methods of soil analysis can still occasionally be heard, like for example at the 16th Worlds Congress of Soil Science in 1998. In general, however, consistency and standardisation of procedures has occurred which — not in the last place — facilitated the development of international soil classification systems.

There is an analogy between developments in soil science at the global level and those in Australia. In the various Australian State and Territory organizations, soils were analyzed in a different way despite the fact that a number of States had soils with similar pedofeatures. The problem was recognised for many decades but in 1992 the “Australian Laboratory Handbook of Soil and Water Chemical Methods” (Rayment and Higginson, 1992) was published, followed some years later by the book “Plant Analysis — An Interpretation Manual” (Reuter and Robinson, 1997) which covers the interpretation of plant analytical data for specific crops. Both books aim to promote the use of consistent methods, procedures and terminologies in soil and plant laboratories of State and territory organisations throughout Australia. No doubt these are useful books.

The current book deals with the interpretation of soil analytical data and accompanies the laboratory handbook. It concerns interpretation for agricultural crops and there is little information on soil interpretation for ecosystem health or environmental regulations. As the previous books, it was initiated by the Australian Soil and Plant Analysis Council (ASPAC). The book consists of 25 chapters authored by 37 soil scientists from across the country.

The first three chapters cover general aspects of soil sampling, preparation, soil testing and interpretation. This is followed by chapters dealing with soil morphology and soil physics in relation to soil chemical fertility. One chapter is devoted to the major soils used for agriculture in Australia based on “The Australian Soil Classification” of Isbell (1996). In total 20 soil orders are discussed of which representative profiles are given including a colour photograph and a detailed profile description. These first six chapters form the introduction to the main text which consist of three parts: chapters on

important soil chemical properties (Chapter 7 to 10), major nutrients (chapters 11 to 16), and minor nutrients (chapters 17 to 24).

In Chapters 7 and 8, soil acidity (including aluminium, manganese and lime requirements) and soil salinity (Ec and chlorine) are treated, which is justifiable taking into account the large areas of saline and acid soils in Australia. Soil reaction values are appraised for a wide range of crops based on a large number of experiments conducted throughout the country. For each crop, the experimental results are listed including: the depth of sampling, soil type, type of study (pot, field, solution culture), study region and an appraisal (i.e., low, marginal, ideal, high). In the salinity chapter, threshold values are given for various crops. The CEC and soil organic carbon are discussed in the next two chapters.

The second part deals with the major nutrients which cover a quarter of the book. The following subjects are treated in each chapter: occurrence of deficiency, factors affecting nutrient availability, soil test procedures, and interpretation criteria and guidelines. The interpretation criteria are given in tables and authors were recommended to use a "best-bet" interpretation based on the literature. Although this approach is disputable, in the absence of adequate data such approach is in itself probably "best-bet". The chapters on minor nutrients including selenium cover almost one-fifth of the book and these chapters have a similar set-up as the major nutrients. There are no chapters on heavy metals like lead or cadmium. In the last chapter, it is discussed how recommendations based on soil tests can be made, followed by a glossary and an index.

So far the contents of the book, now some comments. Not every chapter has the same level of detail. For example, the spatial and temporal variation in soil measurements is treated in some chapters but receives no attention in others — simply because the data are not there. There is no information on the use of geostatistics in evaluating soil fertility parameters, which is an indication of how this pedologists' tool is largely neglected by soil fertility experts. It would have been of interest if a chapter was devoted to the relation between soil variability and soil value interpretation. Also "The Australian Soil Classification", which was in 1996 accepted as the national system (although not by all Australians ungrudgingly), is not used throughout the book and other systems, both Australian and international, are used as well.

There are heaps of books on soil analysis but there are hardly any dealing specifically with the interpretation of analytical results. That fact alone makes this well prepared and informative book a very commendable effort. The book has a strong Australian foundation but many of the principles and interpretation values might be of interest to agricultural experiments in other parts of the world.

References

- Isbell, R.F., 1996. *The Australian Soil Classification*. CSIRO, Collingwood, Vic, 143 pp.
Rayment, G.E., Higginson, F.R., 1992. *Australian Laboratory Handbook of Soil and Water Chemical Methods*. Inkata Press, Melbourne, 330 pp.

Reuter, D.J., Robinson, J.B. (Eds.), *Plant Analysis — An Interpretation Manual*. 2nd edn. CSIRO, Collingwood, Vic, 572 pp.

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