

Report of Travel to Australia
March 18-31, 1999

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SM-CRSP Project *Decision Aids from Integrated Soil Nutrient Management*

Traveler: Fred R. Cox - North Carolina State University

Objective:

Attend the 6th International Symposium on Soil and Plant Analysis “Opportunities for the 21st Century: Expanding the Horizons for Soil, Plant and Water Analysis”, 22-26 March, 1999, Brisbane, Australia, and present a poster “Estimating buffer coefficients for the Phosphorus Decision Support System” by T. George, R. Magbanua, B. Tubana, J. Quiton, A. Almendras, W. Khatib, F. Cox, and R. Yost.

Itinerary:

March 22: Arrive Brisbane

March 22-26: Symposium

March 26: Depart Brisbane

Observations:

The Symposium was attended by over 250 individuals from 30 countries. A list of attendees is available. Naturally, many attendees were from Australia and most attendees were involved with soil test laboratories. After a day of registration and workshops, there were a series of Plenary Sessions composed of about six oral and two dozen poster presentations. The session titles were: (1) Analytical methods and quality assurance, (2) Data presentation, interpretation and communication, (3) Applications in natural resource management, (4) Applications in sustainable production, and (5) Applications in food quality and environmental contamination.

The necessity of having the proper interpretation, a primary goal of the Integrated Nutrient Management Decision Support System, was stressed in all but the first session. One of the oral presentations that gave a good history and showed the continuing need of proper soil test interpretation was “Efficient use of nutrients in agricultural production systems” by A. E. Johnston of the Institute of Arable Crops Research, Rothamsted, Harpenden, UK. Some other interesting oral presentations were: “Coping with variability” by R. G. V. Bramley, CSIRO Land and Water, Glen Osmond, South Australia; “Safeguarding soil and water quality” by L. A. Sparrow, Tasmanian Institute of Agricultural Research, Launceston, Tasmania; “Beneficial use of effluents, wastes and biosolids” by M. E. Sumner, University of Georgia, Athens, Georgia, USA; and “Determination of residual phosphate rock in soil” by K. W. Perrott and R. G. Wise, New Zealand Pastoral Agricultural Research Institute Limited, Ruakura Research Centre, PB 3123, Hamilton, New Zealand.

The topics of the posters centered about the theme for that session. Space was limited and crowded conditions may have restricted participation, but audience interest did not appear to be very high. This was a disappointment, so an oral presentation would be recommended in the future.

All presentations are to be reviewed according to the rules of the organizing committee of the Symposia. Those approved by May 15 will be published in a special edition of Communications in Soil Science and Plant Analysis.

The Symposia was also used to launch a new book: Soil Analysis: an Interpretation Manual by K. I. Peverill, L. A. Sparrow, and D. J. Reuter, of which was said,

It is a practical guide to soil tests. It considers what soil test are, when they can be used reliably and consistently, and discusses what limits their application. It is the first nationally accepted publication that is appropriate for Australian soils and conditions.

The first three review chapters cover the general principles and concepts of soil testing, factors affecting soil test interpretation and soil sampling and handling procedures. The next two chapters describe morphological indicators of soil and include colour plates of major Australian agricultural soils.

These are followed by a series of chapters which present soil test calibration data for individual elements or a related group of tests such as the range of soil tests used to interpret soil acidity. Each of these chapters also summarises the reactions of the particular element or parameter in the soil and describes the test commonly used in Australia.

The final chapter presents a structure approach to nutrient management and making fertilizer recommendations using soil test data.

This manual will be of particular interest to soil and environmental scientists, farm advisers, consultants and primary producers who will find the manual an essential reference to understanding and interpreting soil test data. Many of the soil test evaluated in the book are used throughout the world.

The book was commissioned and developed by the Australian Soil and Plant Analysis Council (ASPAC). It comprises the work of 37 experts, and has been extensively peer reviewed.

1999, 388 pp, colour illustrated, \$94.95, 0 643 06389 7

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This book is well done and will be an excellent reference.

One of the authors, D. J. Reuter, has considerable experience on the interpretation of P soil tests, especially their Colwell soil test. The Colwell is like the Olsen, except they use a 1:100 ratio and extract for 16 h, so it removes about twice as much P as the Olsen. On acid soils, it removes about the same concentration of P as Bray 1. In addition, they usually only sample to 10 cm. With the Colwell, Reuter et al. have found the P soil test should be interpreted according to soil conditions, but have not found soil texture to be the dominant property for the soils in South Australia. In fact, the critical level seems higher with an increase in P sorption value, which is the

opposite of what it would be for highly weathered soils in our Phosphorus Decision Support System. In conversation with Reuter, he postulated that the larger amount extracted by the Colwell may reflect a capacity factor such that it affects the interpretation as compared to other extractants. However, the combination of soil depth and subsoil P concentration in the soils of South Australia that have either a calcareous subsoil or at least one that is not highly weathered may be more important. This has been noted in some of the north-central states in the U.S. An excellent review of their findings in South Australia is in “An appraisal of soil phosphorus testing data for crops and pastures in South Australia” by D. J. Reuter, C. B. Dyson, D. E. Elliott, D. C. Lewis, and C. L. Rudd in the *Australian Journal of Experimental Agriculture*, 1995, 35, 979-95. These results point out some definite limitations on the usage of texture in the P soil test interpretation in PDSS for soils that are not highly weathered. The approach currently used in Australia should be evaluated with the contents of the new book, and if that is not sufficient, through direct contact with D. J. Reuter, Chairman, Natural Resources, CSIRO Land & Water, PMB No 2, GLEN OSMOND, SA 5064, Phone 08 8303 8409, FAX 08 8303 8550, E-Mail doug.reuter@clw.csiro.au.