

## Book review

### Nutrition of Sports Turf in Australia

By Jerry Spencer. Published by Landlinks Press (a division of CSIRO Publishing), 2008. Paperback, 208+viii pp. Price AUD 89.95. ISBN: 9780643095137.

This book is divided into two sections. The 13 chapters in the main part of the book are followed by 10 appendices. After a lengthy and rambling introductory chapter, there are three chapters dealing with the different nutrients, four covering the various categories of fertiliser available, a chapter on products containing fertiliser-herbicide combinations, one on turf species, soils and climatic considerations, two chapters on fertilising establishing and established turf, and the final chapter on fertigation (the application of soluble fertiliser through irrigation systems). The appendices provide detailed tabulated data on nutrient conversion factors, salt indices for common fertilisers, calculations to reduce soil pH, and the characteristics of polymer-coated and other slow-release fertilisers. Surprisingly, the appendices also contain material on soil pH, soil and tissue testing, and the adverse effects of sodium in soils and their amelioration. These are important topics that arguably should have been covered among the main chapters.

Since this book addresses the issue of nutrition of turf, one should be able to decide which nutrients to apply and how much of each is needed. In most cases, the basic information required to develop a fertiliser programme will come from soil testing, which leads us to suggest that this topic should have been covered immediately after a short introductory chapter to set the scene. Logically, this would have been followed by a discussion of pH and how this determines the availability or otherwise of certain nutrients.

Soil testing really is a “garbage in – garbage out” process, and the author’s treatment of this topic is inadequate, as well as being misplaced in the overall structure of the book. If a representative soil sample is not taken, if the methodology used has not been calibrated against extensive fertiliser trials in that region, and if reliable sufficiency levels (by which fertiliser requirements can be objectively and independently assessed)

have not been properly correlated with response data, the results and recommendations may be worthless. In the Australian turf industry, the majority of soil testing (estimated at about 70% - J.J. Neylan, personal communication) is conducted through product supply companies using their own proprietary analysis and reporting systems, principally as a means of supporting product sales. In this context, the widespread use of Mehlich 3 (noted approvingly by the author on p. 174) as a universal extractant for several nutrients, offers economies for proprietary soil testing systems. However, results should have first been properly calibrated as described above and sufficiency levels developed for Australian soils. A start on this has recently been made in Western Australia using historic soil samples from earlier fertiliser trials (Bolland *et al.* 2003). However, some commercial providers have lengthened the extraction time with Mehlich 3, effectively creating another new method for which there is currently no calibration whatsoever.

In his opening sentence of the Preface, the author takes the moral high ground regarding the ‘muck and mystery’ in the Australian turf industry about fertilisers and soil amendments, as well as pointing to misleading promotional information about various products sold. However, while the reader is spared a discourse on such commercial gems as proprietary yeasts that supposedly fix nitrogen from the atmosphere and the (non-) availability of nutrients in crushed rock (but no doubt sold with a dash of nitrogen fertiliser to ensure an apparent ‘response’), industry favourites of dubious or unproven value like humic substances (derived from brown coal), biostimulants and seaweed extracts are all mentioned. In such situations, practitioners should be asking the obvious questions: are these same products used in general agriculture; and if not, why not? Likewise, salicylic acid (discussed at length on pp. 3-4) is of no immediate practical value – unless of course it is set to become the next great thing that can relieve some of the myriad of stresses, both real and imaginary, that restrict the growth of turf.

A strong editorial hand was sadly lacking during the production of this book, and this shows in several ways, some of which are simply annoying for the reader, while others considerably diminish the standard of the publication. Examples of the ‘annoying’ kind include the hierarchy of headings within chapters, which is neither clearly differentiated nor easy to follow: in Chapter 2 for example, the heading “Conclusions” actually refers only to phosphorus and is then followed by “Potassium” in the same font size. The content is not well organised as indicated earlier, and within chapters the material is not always arranged in a logical sequence, *e.g.* Chapter 5 “Straight Nitrogen Phosphorus Potassium (NPK) Fertilisers” includes major sections on magnesium and calcium fertilisers. The inclusion of nursery plants in Chapter 9, while an unnecessary diversion, perhaps confirms what most salesmen would not like more widely known: that turfgrasses in many respects are not unique and share general nutritional principles with other plants. Not infrequently, abbreviations have been used before being written out in full, and in some cases the reader is simply left to guess their meaning as no additional explanation is provided. Contrary to standard professional practice, the source of many of the tables and figures used is not given with their captions; and there is no consistency throughout in the use of common names, scientific names, and scientific names with the appropriate botanical authority. The only determining factor here seems to be whatever the source reference did in this regard.

A more important problem arises from the widespread use of product trade names rather than generic terms, *i.e.*, the active ingredient. This aspect is particularly apparent in Chapters 7-9, which means that such content will quickly become dated as old products are phased out and new ones come onto the market. The use of such names without a standard disclaimer also risks implying that there are certain preferred products within the different categories of fertiliser discussed.

Our final editorial concern is much more substantive. Even a casual reader will notice that referencing varies in different passages in the book from none at all through to quite detailed citations, depending apparently on the source material used. Through the simple use of Google to search for key phrases, we were able to identify 43 separate instances where the author has copied substantial sections from publications by other authors, in many cases word-for-word, without appropriate citation. At the same time,

it is doubtful if the author has actually read some of the publications cited by other authors, and yet they are still listed in his bibliography. For example, the 4 references cited in pp. 178-180 were taken directly from Loch (2006) without acknowledging the source reference, while the similarly uncited and lengthy extract from Harivandi (1999) in pp. 133-137 contributed only 2 references and that from Anon. (undated) in pp. 153-154 had no references. The discussion on the effect of sodium on soil structure (pp. 146-152) is described as “based on Walworth 2006”, but has in fact been taken word-for-word from that source, including Walworth’s 16 diagrams without proper acknowledgment. Commercial websites (*e.g.* EcoChem, Miriwinni Lime) were not exempt, and have also contributed anonymously to this book. Apart from being guilty of multiple instances of copying the work of others without appropriate acknowledgment, the author has reduced readability by cobbling together many different writing styles in this fashion.

To quote from Elsevier’s webpage entitled “Ethical Guidelines for Journal Publication” ([http://www.elsevier.com/wps/find/intro.cws\\_home/ethical\\_guidelines](http://www.elsevier.com/wps/find/intro.cws_home/ethical_guidelines)): “Plagiarism takes many forms, from ‘passing off’ another’s paper as the author’s own paper, to copying or paraphrasing substantial parts of another’s paper (without attribution), to claiming results from research conducted by others. Plagiarism in all its forms constitutes unethical publishing behavior and is unacceptable.”

With so much information now available on the internet and increasing pressure from declining research funds, the opportunities for plagiarism and the temptation to plagiarise have dramatically increased over the past decade or so. As a result, several of the major scientific publishing houses around the world have introduced, or are introducing, anti-plagiarism software to screen submitted manuscripts (*e.g.* Logsdon *et al.* 2010). Such software has been used routinely for some time by universities, and even high schools, to screen student assignments. Based on the evidence in the present book, the Australian publisher can no longer afford to ignore this issue and simply rely on editors and referees to pick up instances of plagiarism, if it hopes to keep pace with its competitors internationally.

In the Preface (p. v), the author claims that his book “is fully referenced and targeted specifically to the Australian turf manager”, so presumably it is not based on “technical data ... purely from a US perspective”. On the contrary, US university publications, both cited and uncited, are the

main sources of technical information; and quite a number of these deal with bentgrass, a cool-season group (*Agrostis* spp.) for specialist use on greens. Nevertheless, the author has still managed to introduce several errors into his final text, as shown by the following examples.

- The recommendation on p. 23 implying that a minimum of 1100 ppm of soil P is required for establishment of Kentucky bluegrass (*Poa pratensis*) seedlings is ridiculously high and environmentally irresponsible; the original source refers quite specifically to tissue extract, not soil, P levels. After describing their tissue extraction procedure, Paul and Davis (1986) state that “For all three soils this critical level was found to be approximately 1100 ppm phosphorus in the tissue”.
- In the space of 3 short paragraphs on pp. 45-46, zinc changes from being “a reasonably mobile element in plants” to being “not mobile in plants”.
- References to the characteristics of warm-season turfgrasses in Table 25 (p. 104) are so erroneous as to be best ignored. Recent Australian studies (Loch *et al.* 2006) have shown that both Queensland blue couch (*Digitaria didactyla*) and kikuyu grass (*Pennisetum clandestinum*) are sensitive to, not tolerant of, salinity; that buffalo grass (*Stenotaphrum secundatum*) is moderately tolerant, not moderately sensitive, to salinity and roughly equivalent to green couch (*Cynodon dactylon*) in this regard; and that the nitrogen requirements of blue couch (medium), buffalo (low) and kikuyu grasses (low-high) should be listed as low, medium and high, respectively.
- The reference to buffalo grass copied without acknowledgment from Harivandi (1999) on p. 134 applies to the North American native species *Bouteloua dactyloides* (syn. *Buchloe dactyloides*), not to *S. secundatum* as it would in an Australian context.
- Depending on the relative levels of sodium chloride and other salts, there are saline, sodic and saline-sodic soils, each of which has different characteristics and requires different management practices; the author, however, seems to associate the overall issue of salinity solely with the presence of sodium.

Plagiarism issues aside, we cannot recommend such a badly written and poorly edited book. For those who want a proper science-based account rather than a commercial slant on this topic area, *Turfgrass Soil Fertility and Chemical Problems: Assessment and Management* by Carrow *et al.*

(2002) offers far better value and greater depth of information (420 pp. for AUD 175.00 from Wiley Australia).

## References

- ANON. (undated) Soil conditioning. SARDI Pests and Diseases (Horticulture). Available at URL [http://www.sardi.sa.gov.au/pestdiseases/horticulture/horticultural\\_crops/apricots/soil\\_conditioning](http://www.sardi.sa.gov.au/pestdiseases/horticulture/horticultural_crops/apricots/soil_conditioning) (Cited 19 August 2010.)
- BOLLAND, M.D.A., ALLEN, D.G. and WALTON, K.S. (2003) Soil testing for phosphorus: comparing the Mehlich 3 and Colwell procedures for soils of south-western Australia. *Australian Journal of Soil Research*, **41**, 1185-1200.
- CARROW, R.N., WADDINGTON, D.V. and RIEKE, P.E. (2002) *Turfgrass Soil Fertility and Chemical Problems: Assessment and Management*. (John Wiley & Sons: New York).
- HARIVANDI, A. (1999) Interpreting turfgrass irrigation water test results. *University of California Publication 8009*. Available at URL <http://ucanr.org/freepubs/docs/8009.pdf> (Cited 19 August 2010.)
- LOCH, D.S. (2006) Soil nutrient testing: how to get meaningful results. In: Carson, C. (ed.) *Healthy Soils for Great Turf. Proceedings of a Workshop held at Cleveland, Queensland, 20 February 2006*. pp. 13-22. Available at URL [http://www.dpi.qld.gov.au/documents/PlantIndustries\\_LifestyleHorticulture/Soil-Nutrient-Testing.pdf](http://www.dpi.qld.gov.au/documents/PlantIndustries_LifestyleHorticulture/Soil-Nutrient-Testing.pdf) (Cited 19 August 2010.)
- LOCH, D.S., POULTER, R.E., ROCHE, M.B., CARSON, C.J., LEES, T.W., O'BRIEN, L. and DURANT, C.R. (2006) TU02005: Amenity Grasses for Salt Affected Parks in Coastal Australia. *Final Project Report for Horticulture Australia Ltd*. 93 pp.
- LOGSDON, S., BRUMMER, C. and DICK, W. (2010) Avoiding plagiarism. *CSA News* (July 2010), **55**(7), 31.
- PAUL, J.L. and DAVIS, W.B. (1986) Minimum phosphorus on turf. *Slosson Project Report 1983-1986*. Available at URL <http://groups.ucanr.org/slosson/documents/1983-19862196.pdf> (Cited 26 September 2010.)
- WALWORTH, J. (2006) Soil structure: the roles of sodium and salts. *University of Arizona Cooperative Extension Publication az1414*. Available at URL [www.ag.arizona.edu/pubs/crops/az1414.ppt](http://www.ag.arizona.edu/pubs/crops/az1414.ppt) (Cited 19 August 2010.)

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Ed. comment: CSIRO Publishing has advised that they have pulped any copies of this book remaining in stock. Since some copies of the book have been sold and the book is still advertised on numerous bookseller websites, I chose to publish the review to inform those people interested in nutrition of turf grass of its possible shortcomings.