Journal of Agricultural Science, Cambridge (1997), **129**, 495–496. *Printed in the United Kingdom*

Book reviews

Methods in Soil Biology, eds F. SCHINNER, R. ÖHLINGER, E. KANDELER & R. MARGESIN. xvii + 426 pp. Berlin: Springer-Verlag (1996). DM 98.00 (hardback).
ISBN 3 540 59055 2.

This book aims to augment classical pedological investigations by providing a series of up-to-date methods in soil biology. The text is divided into three key sections. Part I is the largest of these (20 chapters) and deals with soil microbiological methodology, Part II (seven chapters) covers soil zoology and Part III (two chapters) describes some methods in soil physics and chemistry. This is an ambitious book but the editors have made an excellent job of compiling a selection of methods which will be useful to anyone with an interest in soil science or microbial ecology. Furthermore, college and university teachers will find it a good source of laboratory-based practical exercises.

The layout of the book is clear. Each chapter deals with a particular topic and starts with an introduction which explains the theories and concepts relating to the specific area dealt with in the chapter. Following the introduction are sections which describe individual experimental procedures. Descriptions of methods follow a standard format which detail the underlying principle, the materials, equipment and reagents required, the procedure, calculation of results, notes and references.

Part I, Methods in Soil Microbiology: the text covers soil sampling and preparation, bacterial biomass (e.g. plate count technique, physiological groups by most probable number method, identification and quantification with monoclonal antibodies), indirect estimation of microbial biomass (e.g. fungal biomass by ergosterol content, substrate-induced respiration), nitrogen mineralization, nitrification and denitrification, enzymes involved in carbon, phosphorus and sulphur metabolism, soil algae and ectomycorrhizas, to list just a few of the 20 chapters and specific topics.

Part II, Methods in Soil Zoology: methods dealing with microfauna, mesofauna and macrofauna are described (primarily sampling and abundance measurements) in addition to a chapter devoted to micro- and mesocosms.

Part III, Methods in Soil Physics and Chemistry: this section describes how to determine dry matter content, water-holding capacity, aggregate stability, acidity, organic matter, total nitrogen, ammonium, nitrate and phosphorus content.

Inevitably, the methods described vary in the level of technical expertise and/or equipment needed to perform them. However, the book bridges the gap between three fields of environmental science, those of biology, chemistry and physics, and will be a valuable addition to any laboratory.

H. M. WEST

No-Tillage Seeding: Science and Practice, by C. J. BAKER, K. E. SAXTON & W. R. RITCHIE. ix + 258 pp. Wallingford: CAB International (1996). £49.95 or $90 (hardback).
ISBN 0 85199 103 3.

This book brings together in 14 chapters, each with a separate summary, information published in scientific papers and articles over the last 30 years covering the engineering, soils and agronomic aspects of no-tillage seeding. It begins defensively by meeting traditional tillagers head-on with a chapter on the nature of the risk to farmers of adopting no-tillage technology and points out that this is probably still the biggest obstacle to overcome. Early chapters are concerned with key aspects such as types of no-till seed openers and different methods of achieving seed cover for both dry and wet soils. It is apparent early on that the authors consider that there is nothing to surpass either the inverted 'T' opener for creating the optimum micro-environment for seed germination and establishment, or the Cross Slot drill and plant opener for fertilizer placement, both of which were developed from their research. There is considerable evidence presented to disprove the commonly held view that no-tillage needs more fertilizer, arguing that on non-tilled ground natural channels affect the distribution of surface-applied fertilizer. Placement is therefore essential for the success of no-tillage techniques.

The chapter on crop residues identifies their value for holding water for seed germination and establishment. However, the authors offer no support for straw choppers on combines because of the power requirement, despite the fact that they are so widely used in Northern Europe. In a separate chapter on pasture renovation, i.e. establishing new grasses in old pasture, from which many of the current techniques evolved over 30 years ago, the authors point out that

this still remains the most difficult area for success because of the old grass cover and relatively shallow seeding depths required by grass seeds.

There is also a particularly useful chapter on development and testing procedures relevant to research stations and for on-farm trials. Techniques using large undisturbed soil blocks in the laboratory, taken from the field for scientific analysis of the seed requirement and design of no-till openers and the associated instrumentation (for example a multipoint penetrometer for studying the physics of the seed slot) are described in detail.

Overall the book gives the impression that the technology has been successfully developed and adopted in the Southern Hemisphere, in particular in New Zealand and Australia, although it is strangely quiet about any evidence on uptake by commercial farmers. The chapter on management does not pay sufficient attention to the problems of perennial weeds, the larger quantities of cereal residues typically left in fields in Northern Europe and the soil compaction problems within rotational farming, particularly on silty clay soils.

Nevertheless the book, with over 120 references and its use of simple line diagrams and photographs, will be a useful addition to many libraries in research stations, universities and colleges interested in no-tillage techniques.

IVAN WARBOYS

World Vegetables: Principles, Production and Nutritive Values, by V. E. RUBATZKY & M. YAMAGUCHI. xxiv + 843 pp. London: Chapman & Hall (1997). £56.00 (hardback).
ISBN 0 412 112213 3.

This is an extremely ambitious book, which comprehensively describes the taxonomy, botany, physiology, production, harvest and post-harvest handling of most of the vegetable crops grown throughout the world. There appear to be very few crops that the authors have not covered in their encyclopaedic approach. The book also has eight short introductory chapters that cover subjects as diverse as meeting global food requirements, the origin and evolution of vegetables, vegetable classification, human nutrition, medicinal uses of vegetables and crop physiology.

The depth of coverage on any one subject is limited as a consequence of having taken an extensive approach. I have difficulty in assessing the book because it is not clearly stated for whom it is primarily intended. As it stands, the book is best suited to the undergraduate student who needs to gain a general grasp of the principal factors concerning a specific vegetable's production. The style of writing is pleasantly straightforward with plenty of illustrations to help a student. As a researcher, I also found the book of interest, as it provides a ready source of general information. There are, however, two major weaknesses.

First, there are very few references for the reader to follow up. An example, which is typical of the approach throughout the book, can be taken from Chapter 19 on cole crops. The authors make the interesting assertion that for such crops 'moisture requirement varies with prevailing temperature in addition to stage of plant development'. A researcher or adviser may well wish to find out more precisely about these interactions with moisture requirements, but there is no hint in the text of where this information came from, and none of the titles of the selected references at the end of the chapter seems to be appropriate to this point. This may be an unfair criticism if the book is not intended for the researcher, especially as in order to meet this criticism it would require a possibly unacceptable expansion of the reference list at the end of each chapter.

Second, there is very little critical appraisal of the information presented to the reader. This is at its most evident in the chapter on medicinal uses. A catalogue is presented of different crops and the ailments that they have been used to treat. There is, however, hardly any comment as to whether the traditional folk remedies described have anything other than a placebo effect.

In conclusion, I find this an impressive book which covers an enormous range of crops in a readable style. Given that the approach has been all-embracing, it is a pity that the authors did not also include the likely impact of information technology and crop modelling on vegetable production, and the role of molecular genetics in future vegetable production.

LAURENCE BENJAMIN