

it is the scale of the use of resources and the cost these entail, while for a further group the key priority is to maintain the productivity of the soil itself. The authors point out that world population has risen about 10% in just eight years, and that with rapidly increasing populations some densely populated areas will need to double their food production in the next 25 years. It would appear they believe the key priority is to maintain productivity, and indeed increase its productive efficiency in terms of water and nutrients. The first chapter ends with the declaration that 'rational tillage will go a long way to improving productivity and environmental quality'.

The ambitious objective of this book appears to be to compare and contrast on a world-wide basis, ploughing or cultivation which leaves little or no surface residue ('Conventional tillage'), with 'Conservation tillage'. It draws on results of experiments in temperate and tropical climates, on crops ranging from cereals through maize to wetland rice. References to root crops and vegetables are scarce, despite the fact that these crops are probably some of the more sensitive to soil conditions and that their cultivation can do considerable damage to the soil.

The six chapters form a framework which moves from quoting the published results of the effects of 'Conventional' and 'Conservation tillage' on the measurable characteristics of the soils, to a chapter quoting references on the effects on crop growth. It concludes with a chapter entitled 'Rationalisation of tillage for sustainable cropping'. At first sight this would appear to be a logical way to tackle the subject. However, it has a severe drawback. The separation of the effect of a tillage action on the soil characteristics from its effect on plant growth and then from what action one should take to achieve rational tillage makes it difficult to understand the impact of each of the Conservation tillage systems as a whole. It also leads the authors to repeat issues that have been dealt with in previous sections which makes the presentation disjointed.

It is obvious that the authors have accessed a huge number of references. These alone make up some 35 pages of this 190-page book. They move rapidly through the subject, quoting results from papers. However, even in the last chapter, there are few usable conclusions about what the policy and actions on tillage should be, either in general principle or on a crop/site-specific basis.

The preface states that 'though tillage is an important component of production systems, research on the subject is meager and empirical ... Systematic and coherent accounts of changes in soil properties and processes with tillage and the ensuing plant growth are also lacking'. Unfortunately, it appears that this book does little to fill this gap. However, it raises many unanswered questions and it might be a useful source of references for

somebody wishing to pursue the subject further. Nevertheless, for somebody with an interest in sustainability and looking for an update on the current view on tillage, this book is likely to prove a disappointment.

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**Pseudocereals and less common cereals**, P. S. Belton and J. R. N. Taylor (eds), Heidelberg: Springer-Verlag, 2002, 269 pp., \$89.95 (hbk) ISBN 3 540 42939 5.

The book extensively covers up-to-date knowledge on six grain cereals comprising three true cereals: sorghum (*Sorghum bicolor*), spelt wheat (*Triticum spelta*) and the four major millet species (pearl millet, *Pennisetum glaucum*; finger millet, *Eleusine coracana*; fonio, *Digitaria* spp.; teff, *Eragrostis tef*); and three dicotyledonous pseudocereals: grain amaranth (*Amaranthus* spp.), buckwheat (*Fagopyrum* spp.) and quinoa (*Chenopodium quinoa*).

The authors illustrate the potential from such species, both from the perspective of their nutritional role in developing countries and their value for marginal economies, and from the angle which highlights the novel applications and diffusion in the industrialized world.

Following an introductory chapter on storage proteins and their properties, which gives a focus to the whole book, each cereal or pseudocereal is treated in six separate chapters, at the end of which valuable references are listed.

The strength of the book lies in its capacity to go well beyond a description of the species, concentrating on the chemical composition of the grains and on their nutritional properties. Technological properties are also well treated, providing an excellent insight to geneticists or breeders that may have an interest in distilling specific targets for their activities.

In an era where sustainable agriculture and novel crops are considered to provide a valid contribution to solving problems linked to global climatic changes and the constraints imposed by new or evolving markets for agricultural commodities, the book may inspire breeders and scientists with an interest in crop genetics, genomics, proteomics, metabolomics and other related fields.

An excellent contribution to the knowledge on a few neglected crops with great potential to mankind.

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