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BOOK REVIEWS

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Farmers, Scientists and Plant Breeding: Integrating Knowledge and Practice. David A. Cleveland and Daniela Soleri (eds.). 2002. CABI Publishing, Wallingford, United Kingdom. Pp. xii, 338. $100.00 (hardcover). ISBN 0-85199-585-3.

Farmers, Scientists and Plant Breeding consists of 11 papers that explore the interface between the knowledge which local farmers have of plant breeding and the knowledge of scientists. The objective is to examine how the two connect and how future practice might benefit from a more integrated approach. The regional scope is wide-ranging, with comparative studies drawing on work in Mexico, Syria, Cuba, and Nepal (Soleri et al.), the Andes (Zimmerer), southern Africa (Bänziger and de Meyer), north Africa and the middle east (Ceccarelli and Grando); two chapters which deal with more general issues (Smale, Duvick); and specific case studies from Ethiopia (McGuire), the Philippines (Frossard), Switzerland (Schneider), Cuba (Labrada et al.), and Nepal (Joshi et al.). The crop focus is largely maize, barley, rice, potatoes, sorghum, wheat, spelt, and pumpkins. The whole is very effectively brought together with an introduction by the editors.

The primary target audience for this book is presumably those involved in plant-breeding and it speaks specifically to the very pragmatic interests of those breeders and policy specialists who seek to improve the lives of farmers. It also attempts to find the most appropriate strategies for countries and regions facing different kinds of environmental and economic stress. But it also addresses an issue of increasing theoretical significance over the last decade in terms of understanding the history and dynamics of knowledge systems: namely the hybridization or integration of science and traditional local knowledge. As Cleveland and Soleri point out, specialized technologically driven plant breeding started about 200 years ago, with "scientific" plant breeding based on the ideas of Darwin and Mendel beginning 100 years ago. Such a long and relatively well documented history of interaction between local farmer knowledge and "science" can potentially tell us a great deal about the processes of mutual diffusion and negotiation, as well as about the way global science has itself developed and become institutionalized. Because of this complex history of interaction, exclusive definitions of one or the other become problematic: local definitions of the indigenous as opposed to the scientific often include industrial agricultural technologies, while plant-breeders draw on experience, data, and intuition, which might more readily be associated with local farmer approaches.

Despite this complex history of interaction, twentieth-century farmers became detached from scientific crop breeding for political, institutional, and technological reasons, and, as a result, farmer knowledge was much devalued. Schneider,

for example, chronicles how Switzerland phased out farmer participation in plant breeding during the 1930s. No doubt much the same was happening at the same time in other parts of the developed world. It is probably not entirely coincidental that we should also find an historical convergence between this and what was happening in the pharmaceutical industry where medicines derived from traditional plant resources were replaced with chemically synthesized drugs. Both developments had the effect of severing the links between traditional knowledge and science, and underwriting the self-evident superiority of the latter. The authors seek here to reunite farmer and scientific plant breeding.

The volume first aims to identify the characteristics of the plant breeding knowledge of scientists and farmers, and secondly to examine what any similarities and differences might suggest for further collaboration leading to increased environmental, social, and economic sustainability. The case studies have much to say about a central contradiction: that, while breeders seek to develop a small number of genetically uniform varieties adapted to a geographically wide optimal growing environment with high yield and yield stability, many farmers are often more interested in crops which are adapted to narrower, more marginal, high stress growing environments, which inevitably means dependence on a larger number of varieties (p. 5.) Neither strategy is scientifically any more meritorious than the other. Which strategy is adopted will depend on the priorities of farmers, the socio-environmental constraints under which they operate, and the wider political context. But there can be no doubt that the success of modern agriculture has for some time been threatening the genetic base on which both modern and traditional agriculture depend. The challenge is to reverse this trend, to achieve production benefits for farmers working under resource constraining conditions, and to effectively involve them in research decision-making at each stage.

In their introduction, the editors cover the concept of plant breeding systems. Of course, this must comprise both crop genotypes and growing environments. It must include the creation of genetic diversity through germplasm selection, hybridization and recombination, selection of individual plants and combinations in a range of target environments, evaluation based on best populations in range of test environments, and choice of varieties for release in target environments (p. 6). But none of this makes sense in the real world unless, as the editors suggest, in addition to the biophysical component and the practice of choice, we also consider the social and institutional components, the knowledge of both farmers and plant breeders and the epistemologies on which these are based. In other words, we must extend the idea of a plant breeding system to include those social structures in which the breeding is undertaken and the knowledge which different participants bring to the situation.

There is one puzzling feature about this book, though the observation should perhaps rate no more than a footnote, and that is the absence of any reference to genetically modified (GM) technology, especially given current political discourse. It may be that the editors take the understandable view that the conventional plant-breeding model excludes GM, since this involves invasive lab techniques and the importing of genetic material from elsewhere by means other than sexual reproduction. Alternatively, their coyness may arise from the recognition that to mention it would have opened-up a proverbial "can of worms" and raised a set

of completely different problems for which the approach advocated in this book was not planned to address.

However, in terms of the impact on farmer knowledge and livelihoods there are some striking parallels between the impact of scientific plant breeding in a Green Revolution context and the emerging problems of genetically modified crops. Modern plant breeding, as Ceccarelli and Grando note (p. 297), has historically benefited better-off farmers in more optimal conditions, and this is undoubtedly also the case for genetically modified crops. Scientific crop-breeding in the late twentieth century often showed insufficient understanding of the need to increase yield and yield stability in marginal environments and conserve genetic diversity. We now know, for example, that the combination of El Niño effects and economic instability in parts of Indonesia led to significant harvest shortfalls amongst rural populations. Such populations had moved to small numbers of high-yield rice varieties compared with upland groups that had managed to resist genetic erosion of their landraces. It seems very likely that genetically modified organisms are also set to further marginalize smaller, poorer, and remoter groups of farmers. We should have learned the lessons of insensitive application of Green Revolution technology. It is still possible to do so, despite the vociferousness of GM evangelization.

Farmers, Scientists and Plant Breeding is a very welcome and substantial work which will hopefully become basic reading for all those concerned in plant breeding research and policy implementation. It would be a pity, however, if its apparent specialist focus was to deter others interested in the way scientific and traditional local knowledge interacts, because it has much to say to them also.

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Spruce Root Basketry of the Haida and Tlingit. Sharon Busby. 2003. Marquand Books/University of Washington Press, Seattle. Pp. 160 + maps, photos, illusrations. $55.00 (hardcover). ISBN 0-295983-175

Made entirely from the thin, split roots of Sitka spruce (*Picea sitchensis* Bongard), Haida and Tlingit basketry constituted both a major category of utilitarian household equipment as well as an important aesthetic medium. Much of what is known about these crafts was collected by pioneer ethnographer and naval officer George T. Emmons while he was stationed in Alaska in the 1880s–1890s. Frances Paul gathered additional information on materials preparation, techniques, and decoration in the 1940s.

The author is an enthusiastic collector of these baskets. Her interest has even motivated her to learn the techniques from basket makers who are reviving the craft. The book is intended for the beginning collector or student of Haida/Tlingit basketry. While the present volume adds no original information, this is made up