
This volume presents 19 papers of the 10th International Symposium sponsored by the Nutrition Committee and Trustees of the Rank Prize Funds. The symposium embraced a broad range of topics presented by leading scholars under five topics: the challenge of food needs, resources for agriculture, applications of science to increase crop yield, the role of animal products, and food security and relation of scientists to farmers.

The challenge is seen in dietary needs and economics of food. Starting with the FAO/WHO/UNI (1985) proposition that almost all adults diets are sufficient in protein providing energy requirements are met, J.C. Waterlow’s opening paper focuses on variations in basal metabolism rate (BMR). From the scanty evidence available, he concludes that BMR, the largest portion of energy use, is open to adaptive reductions from Western standards of about 5% for warm climates, 10% for smaller body size, and 10% for slower speed of work. These represent significant savings in energy for poor people in developing tropics. But that is the present situation and whether being smaller, leaner, and slower really matters to quality of life may be the important issue. P. Dasgupta follows with insightful views of the economics of food, focusing on the “poverty trap” that comes with undernourishment. Poor people in isolated village economies have only their labor as a means of procuring food. If labor is inadequate, so will food supply, in a vicious circle. He argues that 18% of the population in developing countries is “extremely poor” and already in such traps and that another 35% is “poor” and at risk. Governmental disincentives towards agriculture, failure to provide infrastructure, failure to provide farmers with “rights” to land, and failure to recognize resource degradation are seen as problems.

Resources of land, water, and energy are considered next. D.J. Greenland and coworkers find adequate arable land for 8 billion people providing soil degradation through nutrient depletion, acidification, and erosion are mitigated. The worst problems are seen in Africa. M. Yudelman sees global distribution of water that might be used in irrigation, and its usurpation by cities, as key problems. Others include energy supplies needed for irrigation, production of fertilizer, operations, and transportation. B.A. Stout considers a long list of alternative energy sources but how to bring these to bear in rural sectors remains unknown.

The applications topic with nine papers led off by Lloyd Evans (on “whence and whether of greater crop production”) comprises the core of the book. Evans concludes that advance in genetic potential will be very difficult without advance in photosynthetic ability but that room remains for advances in adaptation, pest and disease resistance, and management. M. van Montagu argues for greater investment by CGIAR in biotechnology. J. Barber presents a lucid summary of missing links in photosynthesis while emphasizing possibilities for stress tolerance. His report is nicely complemented by S.P. Long’s argument that rubisco’s low affinity for CO2 is the key to progress and that Rhodophyta species may serve as DNA sources for improvement. S.B. Choi et al. of the G.E. Edwards group present an interesting case for yield improvement in cereals (rice in particular) through genetic manipulation of starch biosynthesis while G.S. Khush and coworkers of IRRI detail their case for a new plant type in rice and use of hybrids. D.P.S. Verma argues for drought and salinity tolerance with osmolytes such as proline and various betaines (to my mind, a very dubious direction). The section closes with C. Lamb’s summary of recent progress towards engineering plants with durable disease resistance and M. Gill and N. Poulet’s presentation of a plan for systems research aimed at reducing postharvest losses.

In the fourth section, Young and coworkers of MIT renew their arguments for higher protein standards and more lysine (in line with a 1991 FAO/WHO/UNI report) than FAO/WHO/UNI (1985) recommendations. They conclude that while vegetarian diets can meet their standards, diets containing small amounts of animal products achieve them more easily. R.B. Heath reviews general trends in the animal industry. In the final section, G. Conway reviews cooperation of researchers and farmers in breeding and experimentation and changes in research organization that would aid such progress. D.L. Winkelmann concludes the volume with a return to Dasgupta’s topic of the links between poverty, population growth and food security.

The essays presented here are aimed at an audience of policy makers and managers of agricultural institutions concerned with improving food supplies in developing countries. It provides a worthwhile summary of current problems and of directions in research and extension that may prove helpful. The volume will be useful to professionals in this area and to students in international agriculture curricula.

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This book is about a sustainable or ecologically sensitive agriculture. It does not, however, provide details on recommended agronomic practices, agricultural economics, or production systems. You will have to search those elements out elsewhere. Rather, it provides a more comprehensive systems approach to a thorough and thoughtful discussion and analysis of the interface between and among components of a sustainable agriculture: the farm and land; the environment; and the people, institutions, and policies. This book is about balance and how people learn. Most importantly, it is about the process of learning by producers and the changing role of the future educator or extension worker to that of facilitator.

The book will have immediate appeal to the extension educator and students of learning methodologies and it will have practical application for their work and practice. It should also be on the bookshelf of the teacher and researcher to provide insight and awareness of the changing scope of learning in agriculture and the implications beyond the technology and production aspects.