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BOOK REVIEW

Nuclear Techniques in Soil-Plant Studies for Sustainable Agriculture and Environmental Preservation. Proceedings of an International Symposium jointly organized by the International Atomic Energy Agency and the Food and Agriculture Organization of the United Nations, 17–21 October 1994, Vienna. IAEA Proceedings Series STI/PUB/497. Vienna, IAEA, 1995: 735 p. ISBN 92-0-100895-3. List price $255 US (softcover).

Five decades ago, the monumental breakthroughs in isotope understanding and instrumentation of the 1940s and 1950s inaugurated the dawn of the "atomic age". Perhaps nowhere has the promise of peaceful applications of this technology for the advancement of humankind been more successful than in the study of our natural environment. The interface of water, soil and plants in agro-ecosystems is particularly important as we attempt to ensure that world crop production keeps pace with the demand by our exponentially growing global population. For several decades now, this interface has been increasingly probed with isotopic methods to aid in improvement of crop yield and optimization of soil quality through investigation of photosynthesis, water- and nutrient-use efficiency, fertilizer uptake and loss, nitrogen fixation, effects of pollution, soil organic matter (SOM) dynamics, and soil erosion and conservation.

The 1994 symposium in Vienna from which this book emerged was attended by over 100 participants from more than 40 countries. The meeting highlighted the state of knowledge and methodologies related to isotopic techniques applied to agriculture, and was convened to commemorate the 30th anniversary of the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture. The studies described here variously employ radioactive isotopes (*e.g.*, ^{3}H, ^{7}Be, ^{11}C, ^{14}C, ^{32}P, ^{42}K, ^{45}Ca, ^{86}Rb, ^{99}Tc, ^{137}Cs, ^{210}Pb) and stable isotopes (*e.g.*, ^{13}C, ^{15}N, ^{18}O, ^{34}S), frequently applied as tracers well above background concentrations, but sometimes utilized at their current levels of natural abundance. The Keynote Address by W. G. Sombroek of FAO sets the global perspective by considering the potential influence of anticipated climate change on SOM and nutrients. Just over 600 following pages are devoted to 48 full-length research reports, clustered into 8 primary topics dealing with the latest analytical methods (for stable isotopes) (A. Barrie, Chair), fertilizer studies (C. Hera, Chair), nitrogen fixation (M. Fried, Chair), SOM and nutrients (H. W. Scharpenseel, Chair), water use (G. Vachaud, Chair), plant physiology (D. W. Lawlor, Chair), environmental pollution (O. Van Cleemput, Chair), and soil conservation (D. E. Walling, Chair). The final section contains *ca.* 70 pages devoted to 25 extended abstracts. Most of the full-length papers are in English, and the four exceptions (one in Russian and the three in French) have English abstracts.

This diverse collection of papers represents the growing expanse of isotopic applications in agricultural research. Each major subdivision begins with an invited paper that largely serves as a broad overview and introduction to the topic. Papers on specific studies and applications then follow, representing a wide variety of soils, crops, and sites and types of experimentation. Because of this format, the book should be useful to researchers who need an introduction to these types of isotopic applications, as well as to specialists who are already working in these fields. The volume is well edited, undoubtedly facilitated by the conscientious work of the session chairs. It does lack a subject index, which would have been useful in pinpointing the location of specific topics, especially given such a large body of information. Unfortunately, by most standards this is quite an expensive book, much more likely to be purchased by libraries, laboratories and research groups, than by individuals for their personal use.

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