Testing for Effects of Chemicals on Ecosystems


This book is the report of the National Research Council Committee to Review Methods for Ecotoxicology, chaired by John Cairns, Jr. The charge to the committee was to “identify characteristics of ecological systems that would indicate hazardous effects of chemicals beyond the level of single species, to establish criteria for suitable testing schemes, and to evaluate the effectiveness of available test systems in assessing effects of chemicals within ecosystems.” Results of testing chemicals in ecosystems are difficult to interpret because of the complex interaction that occurs between species and between trophic levels. This report reviews and evaluates current methodology for determining effects of chemicals on ecosystems and makes recommendations for the type of information that is needed if one is setting up such tests. While this report does not provide any new data or definitive answers, it does provide a good review and assessment of the current state of the art technology for assessing the effects of chemicals in ecosystems. Therefore, a copy of this book would be very useful to anyone planning to test chemicals on single species or ecosystems. JERRY C. RITCHIE, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, MD 20705.

Environmental Protection and Biological Forms of Control of Pest Organisms


This book presents the Proceedings of an International Workshop on Environmental Protection and Biological Forms of Control of Pest Organisms, arranged by the Swedish Commission for Research on Natural Resources and the Swedish Products Control Board in Stockholm in May, 1979. There were 38 participants from nine countries, and 13 papers were presented by 15 authors from six countries. Although biological control received two interpretations (population regulation by predators, parasites, and pathogens, vs. regulation by predators, parasites, host resistance, genetics, and behavior-modifying biochemicals), the discussions were largely concerned with predators, parasites, pathogens, and biochemicals. The potential risks to nontarget organisms (including man) by infection, toxicity, or allergy from the preparation and use of biocontrol organisms is fully and very fairly presented in eight papers. Experience with predators and parasites, bacteria, fungi, viruses, protozoa, nematodes, and behavior-modifying biochemicals is impartially outlined. Requirements for testing and registering biological pesticides in the United States, United Kingdom, and France are presented in three papers, and activities of the World Health Organization in this field are discussed. The consensus of views of the participants on use of naturally occurring microorganisms and biochemicals as biological control agents, was that “from a consideration of the published data and evaluation results, and from the experience so far gained in their use, biological control agents clearly present a lower risk potential than that associated with many chemical pesticides.” Little or no risk to the environment or to nontarget organisms has been observed in extensive field use, but this so far involves only “about 0.3% of the multibillion dollar U.S. pesticide market.” To preserve this excellent record in the anticipated future greater use of biocontrols, it was thought to be “essential to develop guidelines as soon as possible for testing for any potential hazards arising from the use of biological control agents.” This commendable conservative objectivity stands in stark contrast to the promotional syndrome of the U.S. Nuclear Regulatory Commission for atomic energy, as described in The New Yorker, April 6 and 13, 1981. The Environmental Protection Agency is developing Guidelines for biological pesticides; if tests show no potential for effects on nontarget organisms no further testing requirement is planned.

It is unfortunate that this workshop was so closely focused on entomological matters, as shown by the cover illustration; only three papers (from England and France) indicated an awareness that biological control of plant pathogens must also be considered in any final regulatory action. The volume is clearly written and well edited and indexed. It provides useful information on the progress of biological control of insects, and on present and potential regulatory procedures for the production and use of biological pesticides. It should prove useful as background reading to those studying biological control.—KENNETH F. BAKER, Ornamental Plants Research Laboratory, USDA-SEA-AR, 3420 S. W. Orchard Avenue, Corvallis, OR 97330.

Surface Mining: Soil, Coal, and Society


The book gives general coverage of factors and problems associated with surface mining of coal. The authors have followed a standard progression when discussing the subject of surface mining and reclamation. Subjects covered include land use of the various regions, soils, procedures necessary for pre-mining inventory of resources, soil and overburden characterization, importance of topsoil replacement, vegetative stabilization, the effects of mining and reclamation on the hydrology of the area, erosion, and post-mining evaluation of the reclaimed lands. The subject of post-reclamation management is only briefly treated. A discussion of management requirements of these fragile lands, particularly in the western United States, would improve the book. Many people have the attitude that if the mined area is returned to its original condition it won’t require any special management after bond release. However, experience has shown that not to be the case.

The authors discuss the political and social impacts imposed on mining and subsequent reclamation of those lands. They also attempt to cover the philosophy of landowner rights vs. the need for society to have a voice in governing both public and private lands. Throughout the book a great deal of emphasis is placed on the Surface Mining Control and Reclamation Act of 1977, PL95-87, and the effect it has had on mining and reclamation.

Portions of the book dealing with the western United States are similar to the National Academy of Sciences report, “Rehabilitation Potential of Western Coal Lands,” published in 1974. The information on soils is very general and will be useful only to those persons with limited or no soils background.

The authors suggest that some of the standards in the laws are too specific and will need to be addressed on a site-specific basis. They also point out that future generations’ land and energy needs should be considered in the mining and reclamation philosophy that is developed.

The book is well-organized and easy to read. The material presented has appropriate literature cited. However, it should not be considered a comprehensive literature review of reclamation and its associated problems. The book is an excellent source of information for the student involved in a reclamation curriculum. It will give the student an understanding of the complexity of the overall mining and reclamation process, the social and political pressures that are involved and the soil, vegetation, climatic and mining differences that exist between regions of the United States. The book will also be an excellent reference for general information for the professional involved or interested in the subject.—G. E. SCHUMAN, USDA-ARS, Mined Land Reclamation/Water Conservation Research, High Plains Grasslands Research Station, Cheyenne, WY 82001.