

and animal species, some of which are not found anywhere else in the world. Temperate forests are also described, but the information is not as detailed as that given for tropical rainforests.

The purpose of this book is to inform its readers of the types of rain forest found in the world, the activities occurring within these forests (legal and illegal), and the consequences of not conserving such diverse and majestic ecosystems. In some instances, the writer chooses to use case studies to emphasize the importance of such ecosystems, the challenges of conservation, and the benefits to be derived by improving the management of rain forests. For example, in one case study, detailed information is given on the Pandrillus Project, initiated in 1988 to help conserve the Drills in Nigeria and Cameroon, a project that has led to the establishment of the Drill Rehabilitation and Breeding Center in Nigeria. This is very informative and enlightening, because the reader will have a greater appreciation for the tremendous work being done to manage and conserve our rain forests. The author effectively conveys the need for the implementation of conservation measures if the decline in rain forests is to be curtailed.

I highly recommend this book for a wide readership, including elementary students, college students, and adults seeking information on rain forests of the world. The information is interesting and timely, and challenges the reader to action. The photographs are beautiful, convey a story, and effectively represent the rain forests. However, too much information is given on some forests (e.g., Brazil and the Amazon) and too little on others (e.g., the temperate region and the Caribbean). Some of the Caribbean Islands that have rain forests were not included, while others were lumped together, a factor that minimizes the impact and importance of such rain forests on the islands. The map at the back of the text does not adequately represent all Caribbean countries. Dominica is incorrectly located, and the island identified on the map should be properly named the Dominican Republic. Although the information given is informative and educational, I would not recommend it as a required text for students.

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### **Phytoremediation: Transformation and Control of Contaminants**

*S.C. McCutcheon and J.L. Schnoor, John Wiley & Sons, 111 River Street, Hoboken, NJ 07030-5774. 2003. 987 p. \$115.00 hardcover. ISBN 0-471-39435-1.*

Phytoremediation is the use of plants to improve degraded environments. This burgeoning new technology exploits the normal metabolic process of plants to degrade, immobilize, or remove contaminants. Plant evapotranspiration returns a significant portion of rainfall back to the atmosphere, thereby lessening ground water contamination. Roots provide a carbon source and an aerobic environment where soil microbes flourish. These, in turn, degrade some organic pollutants. Plants can adsorb and translocate contaminants, whereupon they are metabolized, stored, or volatilized. Phytoremediation is low-cost relative to other remediation technologies because, in essence, it is similar to normal agricultural or silvicultural practices. Nevertheless, successful phytoremediation is based upon a great deal of research and development.

This comprehensive new book details phytoremediation at all levels: from basic molecular and biochemical processes

through to practical considerations in field applications. It is, therefore, of interest to all intended audiences including students, researchers, engineers, regulatory authorities, and end-users. The wide scope and high quality of this peer-reviewed book make it an essential reference for all workers in the field of phytoremediation.

The tome is divided into seven sections, facilitating the browser's search for information. Its ease of use is further aided by a "summary of practical implications" at the start of each chapter. The first section contains detailed descriptions of all fields of phytoremediation and their state of development. However, the remainder of the book focuses on areas that are showing the greatest commercial promise. Particular attention is paid to the phytoremediation of xenobiotic chemicals (i.e., those that living systems are not normally exposed to). The role of plants as "green livers" that take up and metabolize xenobiotic contaminants is introduced.

Plant-contaminant interactions are discussed in the second section, with all the salient points covered that affect phytoremediation. These include mechanisms by which contaminants are degraded, plant tolerance, root architecture, and determination of tree water-use. Sections three, four, and five present the degradation mechanisms, volatilization, and hydraulic control of different contaminant classes: aromatic, phenolic, and hydrocarbon (Section 3), explosives (Section 4), and halogenated compounds (Section 5). Section 6 covers practical aspects of implementing this technology, and includes a chapter on using plants to concentrate brine. Some of the latest advances of phytoremediation are outlined in Section 7, with research showing that plants may be used to tackle atmospheric pollutants, methyl tertiary-butyl ether (MTBE), cyanide, and perchlorate. Plant and microbe database tools that can be used to assist selections of suitable organisms for bioremediation are presented in Chapter 30, and the book concludes with an evaluation of phytoremediation in the field.

A recurring theme throughout is the necessity of genetic manipulation (GM) to produce effective plants for remediation. Many xenobiotics are degraded through the expression of a specific enzyme, the production of which could be greatly enhanced through GM. Lack of public acceptance of this technology, particularly in Europe, may significantly retard the development of phytoremediation.

In order for phytoremediation to become a widely accepted cleanup standard, developments such as patent protection, regulatory acceptance, and effective commercial implementation are as important as scientific research and development. This book integrates both these aspects and represents an excellent contribution to the ultimate success of phytoremediation technology.

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### **Methods in Agricultural Chemical Analysis: A Practical Handbook**

*Nigel T. Faithfull, CABI Publishing, Wallingford, Oxon OX10 8DE, UK. 2002. 304 p. \$110.00 hardcover. ISBN 0-85199-608-6.*

Agricultural chemical analysis has become a very important aspect of agronomic and environmental sciences. This book would be useful for anybody working in this field, and those who want to do it in the future. Guides, methods, and materials needed for a complete agricultural analysis are described.