The past two decades have witnessed a revolution in our understanding of plant roots. New analytical approaches and conceptual advances in fields as diverse as soil microbiology, plant genetics, and geometric modeling have opened new perspectives on the ‘hidden half’ of plants. These insights have coincided with renewed appreciation for the importance of roots for human welfare. For example, a better understanding of plant roots is playing a central role in developing crops adapted to infertile tropical soils, and in predicting how plants growing in diverse soils may respond to global climate change.

This book by Peter Gregory, noted root biologist and Director of the Scottish Crop Research Institute, provides an excellent introduction to this burgeoning field. The book consists of nine chapters, including overviews of root architecture, development, function, interactions with the abiotic and biotic environment, the rhizosphere, genetics of root traits, and roots as management tools in agroecosystems. These topics encompass a wide array of disciplines and Gregory does an exceptional job in summarizing key points and highlighting recent research developments while remaining focused and concise. Each chapter is followed by several pages of references including both classic and recent papers and reviews that will serve as a useful introduction to the literature. Both basic and applied aspects of the topics are considered, but a recurring theme of the book is the functional relevance of root processes for plant performance in agricultural and ecological contexts.

The book is especially useful in providing an overview of root research from British and Australian researchers, which is not surprising given that Gregory is from this community, and is not inappropriate given that this community has led the field of root/soil interactions for some decades. The book devotes relatively less attention to molecular biology in favor of processes at the cellular, organ, and organism scales, which is one of the reasons that this book will be accessible to non-specialists and graduate students.

Several chapters devote attention to methodology, which is appropriate considering that methodological advances have been an important element of research progress in root biology. Roots have many complex interactions with the soil environment, but native soils are highly variable and are often not amenable to controlled studies of root processes. The choice of growth medium and analytical approach can therefore have substantial effects on the relevance of results obtained. Gregory’s non-dogmatic, rational treatment of methodological issues should be very useful for beginning root researchers.

The text is clear and straightforward, and is illustrated with many excellent figures and illustrations, including 12 pages of color plates. The physical quality of the hardbound edition is also excellent.

The book will be quite useful as an introduction and reference for researchers in related fields including agronomy, soil science, plant molecular biology, and plant ecology, and will be especially valuable for beginning graduate students, and teaching faculty.

Overall this is an excellent book, providing an introduction to a diverse and complex subject in a clear, concise, and engaging manner. The book strikes an excellent balance between basic processes and field applications, between established knowledge and current research directions, and between the complexity of root processes and unifying themes and patterns.

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