



Essential Soil Science: A Clear and Concise Introduction to Soil Science, by Mark R. Ashman and Geeta Puri, 2002, Wiley-Blackwell, USD55.00, ISBN-13: 978-0632048854, 208 p.

The study of soils has been integrated into many disciplines including the earth sciences, biological sciences, agronomy, and engineering. Traditionally, students first learn about soils through introductory classes. During these introductory classes, students are exposed to soil terminology and basic soil concepts; however, a student's exposure to soils, as a topic of study, is minimal. Many institutions do not offer lower-level soil classes, therefore upper-level soil classes may be the only available option for interested students. In situations where students do not have an essential soil background, time must be taken by the instructor to provide students the information necessary to move forward in such classes. It is in this light that *Essential Soil Science: A Clear and Concise Introduction to Soil Science* appears useful. The 185-page text, by Mark R. Ashman and Geeta Puri, was written to provide readers with basic concepts of soil science.

The authors preface the text by indentifying their specific targeted audience: "students who need to understand quickly the basic principles of soil science" (p. vii). The authors further state that the text assumes "no previous scientific knowledge" (p. vii). On these accounts, readers who fit the targeted audience will find this text very useful, whereas those who already have this knowledge will find the text elementary and not worth the time to read.

The text is divided into seven chapters, each focusing on basic and important aspects of soil science. Chapter one describes the processes in which rocks are transformed to soil. Readers are introduced to elementary geology, weathering processes, soil transformations, and movements of soil constituents. Chapter two is dedicated to soil texture, structure, porosity, and permeability. Together, the first two chapters provide a great deal of background information on basic properties used to describe soils. This background information provides a good start for introductory readers; however, the information is concise and brief. The chapters are similar to introductory textbook soil chapters and as such may not provide any more information to the readers than texts to which they have already been introduced.

Chapters three and four discuss soil chemistry. In chapter three, readers are introduced to such topics as clay mineralogy, soil colloids, soil acidity, and soil nutrients. All these topics are discussed in detail, including how each interacts with each other within the soil. The types of soil microbes and how they cycle

soil nutrients are discussed in chapter four; however, chapter four specifically lacks a discussion on pedoturbation and biotic influences on soil development. While these chapters are full of relevant information, they are dense and contradict the intended scope of the text laid out by the authors in the preface. By introducing readers to chemical equations and soil chemistry jargon, readers may be intimidated, especially those readers with no scientific background for whom this text was written. Simply put, too much material is presented in these chapters without enough background information that an introductory soil enthusiast would need. These chapters may be readable when time is taken to look up supplemental material that will help to understand the topics.

Chapter five shows readers how to set up and conduct a soil survey. This information will be useful for those who plan to conduct field research involving soils. This chapter also introduces readers to soil taxonomy, including the United States Department of Agriculture (USDA) soil survey classification scheme and the Soil Survey of England and Wales classification scheme. Readers are also introduced to soil mapping, which would be helpful for students interested in the geographical distribution of soils. Considering the vast topics covered in chapter five, the authors do a good job of summarizing them into a concise section.

Chapter six, the longest chapter in the text, focuses on soils and agricultural use. This chapter discusses how physical, chemical, and biological soil conditions can be altered to maximize soils in crop production. Many practical examples are provided (e.g., variations in cultivating, liming rates). This chapter is specifically targeted to readers interested in agronomy; however, the geologist and ecologist may find the chapter interesting as well. Readers with vegetable gardens may also find the cultivation, moisture control, and acidity control sections very useful; however, this chapter does not serve as a how-to-garden guide.

Chapter seven, the concluding chapter, addresses the contamination, pollution, erosion, and quality of soil. The majority of this chapter is focused on soil pollution, and readers are walked through the basics of how a soil first becomes contaminated, the types of inorganic and organic contaminants found in a soil, and how one can remediate a soil.

The text also contains an abbreviation index, which aids readers looking for specific topics, and an appendix listing fur-

ther readings applicable to each chapter and other useful links. Readers will also find very helpful the essential points (bulleted notes) at the end of each section and the chapter summaries at the end of each chapter. After reading a section, one should be able to understand each of the essential points. If not, it is clear to the reader which section or subsection needs to be reread. Similarly, the chapter summaries easily and concisely recap the chapter's main concepts. The text is very readable except for noted difficulties that some readers will have in chapters three and four. The easy readability of the text is enhanced by very well drawn and developed figures. Each chapter contains a variety of black-and-white figures with detailed captions. At times the figures can be overwhelming for an introductory reader, but for the most part, figures complement the text and are helpful to readers.

In summary, this text succeeds in introducing the basic concepts in soil science, and readers will come away with a very basic understanding of the multiple aspects of soil science.

Some readers may find the entire text useful, whereas others may only find certain chapters useful. Readers with little previous knowledge should not be intimidated by the chemistry or by the vocabulary found in chapters three and four; a reader who is overwhelmed may find supplemental material useful when reading these chapters. This text fills a specific niche in soil science, and as such I would recommend this book as a supplemental or optional textbook for lower-level soil classes. If used in this way, instructors can dictate to individual students the chapters that will be most beneficial based on individual needs.

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