scribes, the promise of useful products from many plant species still remains.

The plight of arid lands in many world locations is the result of having serious environmental problems that reduce their ability for sustained productivity. Thus, the authors portray a seeming enigma—how can the promises of new plant products be fulfilled if the processes of deterioration are not understood and reversed?

In writing *The Plight and Promise of Arid Land Agriculture*, the Hinman brothers drew upon rich professional backgrounds. Dr. C. Wiley Hinman wrote from his extensive research and development of natural plant products in the agricultural and pharmaceutical industries. In 1983 he started his own consulting company that is devoted to establishing alternative low waste crops for use in arid and semiarid lands. Dr. Jack W. Hinman enriched the book with knowledge from his 34 years as a research scientist and manager in the pharmaceutical industry specializing in natural plant products.

Is the plight of arid lands so great that their promises of new products is in jeopardy? This question is discussed in the first two chapters as the authors take a quick world-wide journey to arid lands in the Eastern and Western hemispheres. In the Eastern Hemisphere some areas such as the Sahel of Sub-Saharan Africa have been stricken by drought, which only adds to the woes brought on by overgrazing, excess fuelwood cutting, and exploitative agricultural practices. Feeding burgeoning populations is causing problems of unsustainability in the Sahel zone of East Africa, Australian shrublands, semiarid regions of Eurasia, the arable dry lands of China, dry portions of the Indian subcontinent and the oil-rich but soil-degraded countries of the middle East.

In the Western Hemisphere the authors provide an uneven treatment of the 10 North American desert regions—giving an extra amount of attention to the Southern Arizona area they know so well. For South American arid lands the authors provide some geographical and historical reasons for threatened areas of arid Chile, Argentina, and northeastern Brazil. Several other world regions are included in the discussions because of problems created by deforestation and exploitative land use, but not because of aridity. Two chapters are not enough to give a good understanding of the plight facing the world’s arid lands and their multiple problems.

Chapter three takes a positive look at useful and sometimes unconventional management practices that work in arid lands. As might be expected, irrigation and crop management systems used in arid lands must have two major objectives: providing efficient water application and preserving soil productivity. Essential concepts and appropriate applications for arid lands include large and small irrigation systems; effective use of saline water; land preparation methods, including vertical mulching and minimum tillage; cropping methods; and experimental treatments for reducing transpiration and evaporation. The authors remind their readers that genetic engineering of plants has great potential for improvement of plants and animals. However, they could provide some examples of target traits to improve adaptation to drought stress conditions in addition to the general and somewhat superficial treatment given at the end of chapter three. Further, they provide no basis for further genetic engineering of plants by the reader. Without the cooperation of government, industry, and academia, the promise of new crops may not be realized because of inadequate incentives, difficult market conditions, and high costs of development. As an example of a fulfilled promise, we have the success story of soybean development into Hopi blue corn, which through millennia of traditional production is well adapted to the arid southwest on a host of untested native food plants through there is a bright promise for many “new” food crops.

The promise of industrial products from arid lands provides further excitement for readers who followed the literature on unused native plants. Discussed in Chapter 6 are extraction methods modeled on laboratory procedures. Volume extraction methods have been developed to yield and product quality such as in the advanced and sequential solvent extraction of latex from plant leaves. Combinations of thermal and chemical methods of extraction without destruction of valuable components and conversion of biomass to methane, volatiles, and fuels is compelling in its coverage and is interesting in its treatment of an array of disparate topics. Anyone who enjoys new crop development will find this book in his library.—CYRUS M. MCKELL, College of Science, Weber State University, Ogden, UT 84408-2501.

Unit Processes in Drinking Water Treatment


Municipal drinking water treatment is a complex and multi-step process comprised of various unit processes, such as coagulation, sedimentation, filtration, disinfection, and chlorination. Media attention is focused on the safety of drinking water and involuntary chemical changes in the source water. Currently, much emphasis is placed on improving the quality of drinking water through treatment, but there are few books that focus solely on the treatment processes in current use. This book, *Unit Processes in Drinking Water Treatment*, provides a comprehensive treatment of all the unit processes that are used in the manufacture of drinking water. Each of the 16 chapters in this book is written by a specialist in a specific area of water treatment. The book is divided into six parts and can be used as a text, a reference, or as an aid to the development of a comprehensive drinking water treatment plant.