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Challenges facing society over the next several decades include food security, loss of soil and water resources and associated ecosystem services, energy security, and climate. Soil is at the root of these issues. Embracing science-based soil management practices that directly respond to these challenges is both crucial and essential for the long-term sustainability of soil resources. That is the essence of this book. The chapters found herein are relevant, current, and written to respond to these global issues. The strength of this book is its ambitious goal of taking the best science and presenting it without oversimplification, but achieving an accessibility that will be appreciated by readers from related disciplines or those who are not Ph.D.s. It is not a textbook, but it is a knowledge-packed book for learning that is readable for a vast audience.

Because the Soil Science Society of America and the American Society of Agronomy support the management of soil as fundamental to life, this book speaks to a priority message of our sciences.

Charles W. Rice, Soil Science Society of America President, 2011
Newell R. Kitchen, American Society of Agronomy President, 2011
Management of the soil encompasses a wide range of practices with the express purpose of improving the capability of the soil to perform the various functions. Improvement in soil management practices will result in increased soil functionality and will be realized only if these practices are based on scientific principles. In assembling this book, we had two primary goals. The first goal was to gather the information about the emerging challenges in soil management from a number of different perspectives. The second goal was to develop this book to help a wide range of readers understand the need and opportunities in improving soil management. As editors and active researchers in the area of soil management, we are aware of the need to enhance our soil and protect our environment for future generations.

We feel that we must continue to enhance our soils and prevent further degradation of the soil resource. If we consider the need to increase the world’s food supply over the next 40 yr to meet the demands of the rapidly expanding population, we will have to develop soil management practices capable of increasing and sustaining the production necessary to meet these demands. A focus on the efficiency of the current production systems will be necessary to maximize what we produce from a given amount of water, nutrients, carbon, and light. Our personal concern is that we have not focused enough on how to improve our soils and soil management practices. The demands to produce food, feed, fuel, fiber from our soil resources demands soil with the capability of supplying water, nutrients, oxygen, and microbial diversity.

We express our sincere thanks to all of the chapter authors and their unselfish efforts to share their knowledge by preparing these chapters as a summary of the current state of knowledge. Without their dedication to advancing scientific knowledge, it would be impossible to develop this collection of materials covering the diverse set of topics within this book. We also thank the ASA and SSSA headquarters staff for their help and assistance in preparing this final product and the Societies for supporting and encouraging us to undertake this task. Finally, we thank you as the reader for taking the time to increase your knowledge of the challenges in soil management.

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Soil management is the application of operations, practices, and treatments to protect soil and enhance its performance (such as soil fertility or soil mechanics). It includes soil conservation, soil amendment, and optimal soil health. According to the EPA, agricultural soil management practices can lead to production and emission of nitrous oxide (N2O), a major greenhouse gas and air pollutant. Activities that can contribute to N2O emissions include fertilizer usage, irrigation and tillage. Soil management is a key component to the success of site-specific cropping systems management. It starts with a farmer's capacity to vary tillage and inputs according to soil conditions and needs. This factor is important in seedbed preparation, weed management, sustainability, and has the potential to lower or optimize production costs within an individual field. With a GPS Soil Management “A Guide for Tasmanian Farmers.” Published by the Department of Primary Industries, Water and Environment. Printed by Regal Press, Launceston, Tasmania. © Copyright 2002. ISBN 0 7246 6742 3. This document outlines soil management guidelines for Tasmanian farmers. The Department of Primary Industries, Water and Environment (DPIWE) and the Tasmanian Farmers and Graziers Association (TFGA) accepts no responsibility for any application of this information.