

# Preface

This textbook is the result of a long experience teaching general agronomy at the University of Cordoba (Spain). After many years of teaching the subject to agronomy engineering students in Spanish, we now offer a separate class, taught in English, and this book reflects the organization and materials used in the class.

The book reflects our vision of agronomy as a complex, integrative subject at the crossroads of many disciplines (crop ecology, agrometeorology, soil science, agricultural engineering) with a strong emphasis on providing quantitative answers to specific problems. Our experience has been primarily with water-limited agriculture; hence, there is an emphasis throughout the book on the role of water in the agronomy of agricultural systems. We also seek to leave behind artificial boundaries that have been created in the past among crop production areas such as horticulture, pomology, and field crops that have led to separate journals and professional careers in the past. In this book, we cover all common aspects of crop management and productivity that should concern anyone dealing with the management of agricultural systems, and we provide relevant examples from different cropping systems, from herbaceous to woody crops.

Our quantitative approach is based on providing the ideas and concepts needed as foundations in all the quantitative assessments required for making informed, technical decisions in farm management. Farmers operate along the philosophy of learning by doing (adaptive management), and agronomists should also follow the same path, but they should have the knowledge and tools that are needed to first correctly interpret the complex responses of the system to change and then provide reasonable options for subsequent actions. This book does not fall in the category of those that focus on providing prescriptive agronomic recommendations or blueprints that cannot be generalized because of their empirical nature. Rather, we have tried to concentrate on the analysis of crop productivity processes which lead to identifying the main factors affecting management decisions and on how to get quantitative answers to agronomic problems in the context of making current agricultural systems more sustainable.

From a teaching perspective, the book includes two short blocks on the environment and crop productivity that could serve as an introduction for students with no background in soil science, crop ecology, or agrometeorology. The third, larger block, is devoted to specific crop production techniques (sowing, soil management, irrigation, fertilizers, etc.). A number of our colleagues have contributed to the writing, all with the aim of providing future agronomists and practitioners with the quantitative tools required to calculate the adequate level of inputs (such as water, nutrients, or energy) for sustainable crop production and to assess the yield responses as a function of climate and soil conditions and of management options.

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