

Preface to the Second Edition

The second edition results from an invitation that I received on April 22, 2013, from Elsevier/Academic Press to revise the first edition. The major changes in the new edition include the addition of three chapters: one on dual thermal probes to monitor soil–water content (Chapter 9); one on sapflow (Chapter 21); and one on interception of direct-beam solar radiation by leaves of plants (Chapter 30). The comments made in the Preface to the first edition hold for the second edition. These new chapters result from lectures that I give in my graduate class on soil–plant–water relations. They deal with principles and are not a review of the literature. As for the original chapters, I have ended the new chapters with biographies about the people who developed the concepts in the chapters.

In revising the book, I have interviewed experts on the topics—i.e., Loyd R. Stone about tensiometers (Chapter 5); Gerard J. Kluitenberg about the dual thermal probe technique (Chapter 9); and Kevin P. Price about drones (Chapter 27). I thank each of them for sharing their knowledge with me.

Based on a suggestion of one of the reviewers, I have kept all of the original chapters (27 of them). Changes made in the original chapters, based on comments from the reviewers, are the following: a reorganization of the order of the chapters; a shortening of some of the titles; and an addition of the history of the concept of the soil–plant–atmosphere continuum (added to Chapter 22). Other additions include the following: a problem showing how to convert grams to slugs (Chapter 2); Helmert's equation for calculation of the acceleration due to gravity (Chapter 4); a problem showing how to determine soil water content with time domain reflectometry probes (Chapter 8); a discussion of the least limiting water range (Chapter 10); a biography of Katherine Esau (Chapter 15); notation of the continuing controversy about the cohesion theory (Chapter 20); a discussion of the normalized difference vegetation index (Chapter 27); and an analysis of the effect of elevated carbon dioxide on water-use efficiency (Chapter 29).

I express my appreciation to the following people who have helped make this new edition possible: Candice Janco, Senior Acquiring Editor of Elsevier/Academic Press, for inviting me to revise the first edition; Sean R. Coombs, Editorial Project Manager, Elsevier, Inc. Science and Technology Books, for his prompt and kind help throughout the revision; Brent E. Clothier and Steven R. Green, both of the Systems Modelling

Group, The New Zealand Institute for Plant and Food Research, Ltd., Palmerston North, New Zealand, for figures provided in the chapter on sapflow (Chapter 21); Soil Measurement Systems, Tucson, AZ, for providing figures of tensiometers (Chapter 5); Eldon J. Hardy, my longtime professional draftsman, for redoing the population figure (Chapter 1); and Marsha K. Landis, Graphic Designer and Web Manager, Kansas State University, for taking pictures of equipment shown in the new edition. I also want to give special thanks to the three reviewers of the draft proposal, who supported publication of the revised edition: Bingru Huang, Professor II, Department of Plant Biology and Pathology, Rutgers University, New Brunswick, NJ; William L. Kingery, Professor and Graduate Coordinator, Department of Plant and Soil Sciences, Mississippi State University; Mississippi State, MS; and Anvar R. Kacimov, Professor and Dean, College of Agriculture and Marine Sciences and Head of the Department of Soils, Water and Agricultural Engineering, Sultan Qaboos University, Al-Khob, Sultanate of Oman.

As for the first edition, I dedicate the second edition to my family whose support made the book possible.

*M.B. Kirkham
Manhattan, Kansas.
January 1, 2014.*