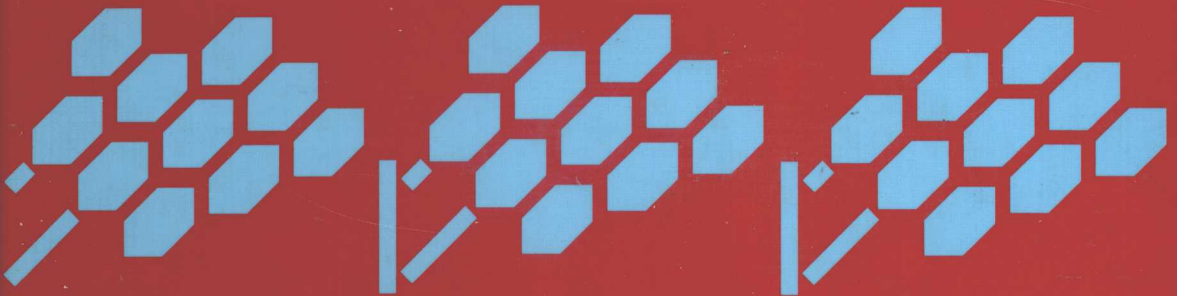


Developments in Agricultural Engineering 13



Microirrigation for Crop Production

Design, Operation, and Management

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Developments in Agric



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Design, Operation, and Management

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PREFACE

Microirrigation, the slow and targeted application of irrigation water to prescribed soil volumes has become synonymous with modern and efficient irrigation practices that conserve precious water resources and maximize plant performance. Microirrigation technology and application have grown steadily during the past 20 years. Today, nearly 3.2 million ha are irrigated by some type of microirrigation system including surface drip, subsurface drip, bubbler, or microsprinkler. Initially, microirrigation was used almost exclusively for high-valued crops based on profitability per unit area such as trees and vines. In recent years, producers have begun using microirrigation on field crops such as tomato and cotton. Improvements in the reliability, durability, and longevity of system components and materials and the introduction of innovative designs have reduced the cost of microirrigation to levels that enable small-scale producers in both industrialized and developing countries to use microirrigation. Continuing research and development have improved emitter design, system design and installation, water filtration and treatment, and system and crop management since the publication of the first edition of this book, *Trickle Irrigation for Crop Production*. Also, improved reliability of computers and data acquisition and processing has widened the application of automated control to microirrigation and led to broad acceptance in both large and small commercial field operations.

The primary goal in producing this book revision is to provide information describing the remarkable advances achieved in microirrigation since 1986, when the first edition of the book was published. The first edition has served primarily as a reference book and as a text book for instructional use. We have crafted this new edition with the goal of serving both as a text and reference book for irrigation professionals. The book is divided into three sections, I. Microirrigation Theory and Design Principles, II. Operation and Maintenance Principles, and III. System Type and Management Principles. Chapters One through Six introduce the topic of microirrigation with a focus on fundamental information and theories related to water and salinity management followed by the procedures for basic hydraulic design and a discussion of system economics. Chapters Seven through Eleven provide detailed descriptions of system automation and chemigation principles, application of recycled or reclaimed wastewater, and system maintenance. The final section of the book, Chapters Twelve through Fifteen, covers the design and management considerations for the four major types of microirrigation, surface drip, subsurface drip, bubbler and microsprinkler. The information presented should enable irrigation professionals to design, maintain, and manage microirrigation systems.

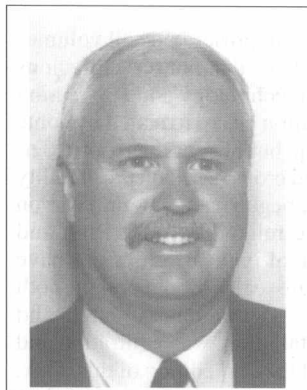
We acknowledge the significant contributions of the authors of the first edition of this book to the field of microirrigation. Some of the current chapters include original authors from the first edition, whereas other chapters required recruiting new authors. The first edition was developed under the auspices of the USDA-RRF Western Regional Research Committee, W-128, *Trickle Irrigation to Improve Crop Production and Water Management*. Although this revision is not a formal product of the current USDA-RRF Western Regional Research Committee, W-1128, *Reducing Barriers to Adoption of Microirrigation*, it should be noted that several of the current committee members are contributing to this edition.

We thank our families and also those of the authors for their patience and cooperation during the long preparation process of this book. We also especially thank Ms. Vicki Brown, Kansas State University, for her meticulous work in finalizing the manuscript for printing.

May 2006

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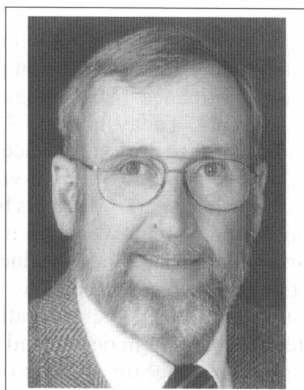


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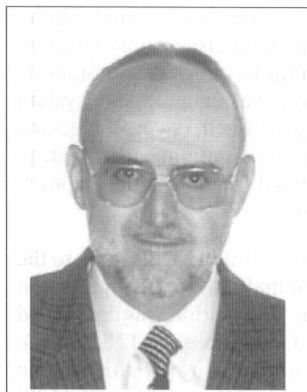
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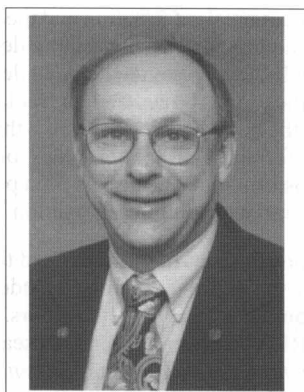


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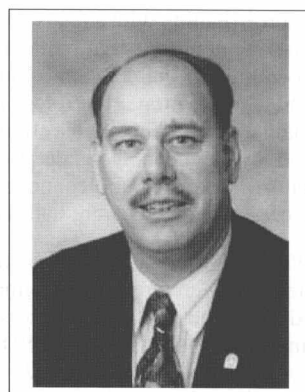


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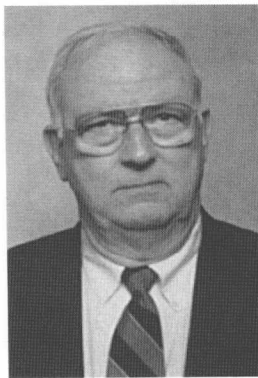


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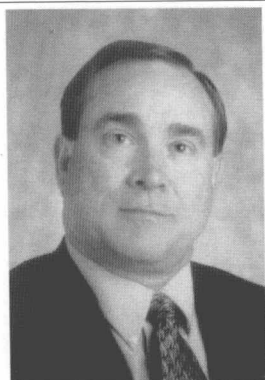
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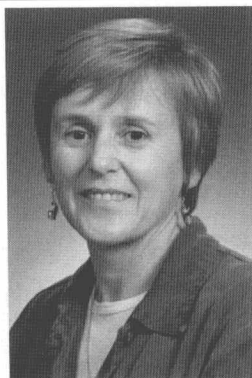
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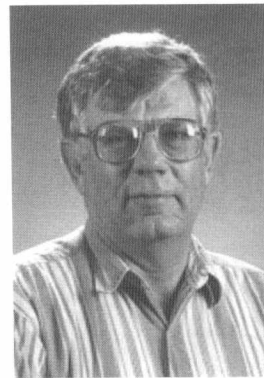
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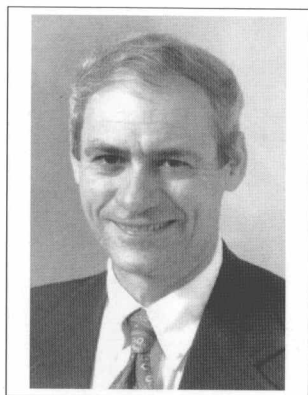
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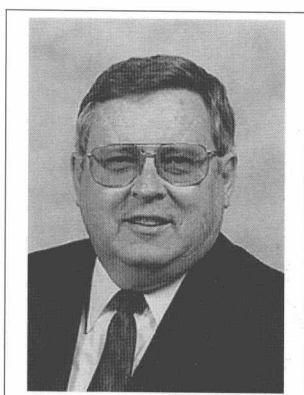
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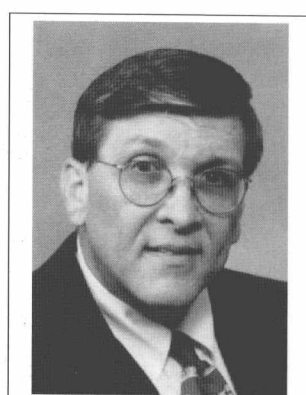


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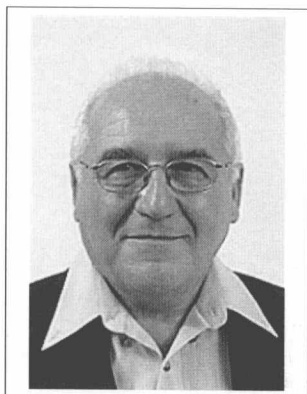
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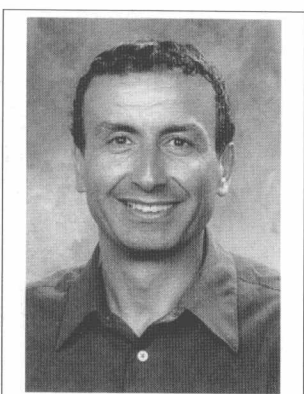
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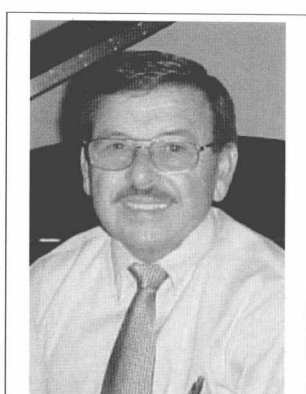
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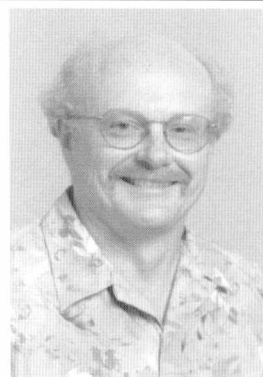


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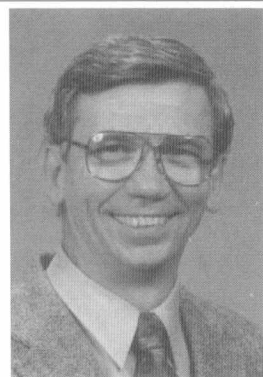
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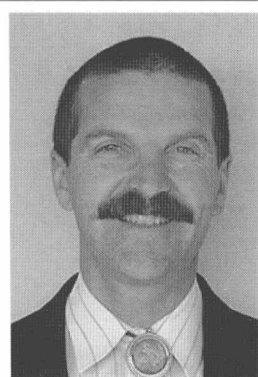
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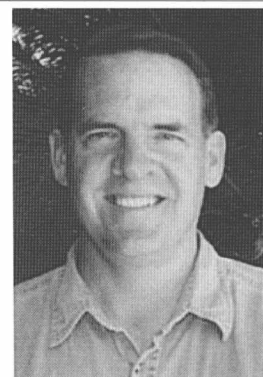


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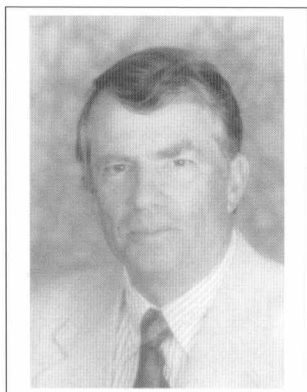
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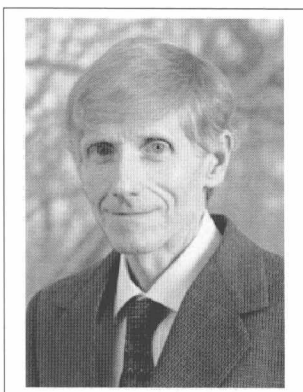
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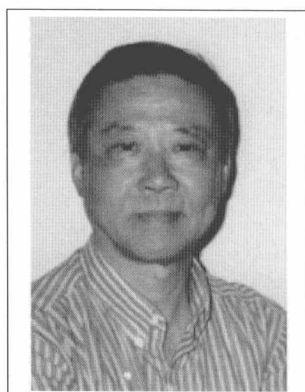
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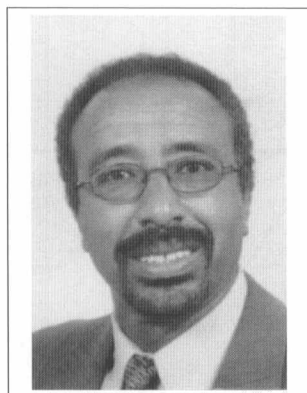
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