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# **Crop Tolerance to Suboptimal Land Conditions**

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Cover photograph: Sites of  $\text{Fe}^{3+}$  reduction (dark area, Prussian blue) principally on young lateral roots of T3238FER tomato (Fe-efficient, top) and practically no reduction (bottom) by T3238FER tomato roots (Fe-inefficient, right).

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# Foreword

As the world rushes to that inevitable “crossroads” of rapidly increasing population and a more slowly ascending ability to produce food, the pressure to utilize marginal lands for food production grows ever greater. Therefore, the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America are especially pleased to join in sponsoring this publication which outlines some of the problems of and potential for utilization of these suboptimal lands. The diverse background and differing geographical locations of the authors result in a picture painted with a “broad brush,” while contributions of individual authors on specific topics bring detail into that picture. It is hoped that this special publication will be thought-provoking and that it will eventually contribute to the optimal use of suboptimal lands to grow food.

M. D. Thorne, Past President  
American Society of Agronomy

D. N. Moss, Past President  
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V. J. Kilmer, Past President  
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# Preface

This Special Publication records in considerable detail, the ideas, concepts, and experiences of 19 outstanding scientists who have observed crop tolerances to different stresses associated with suboptimal land conditions in different parts of the world. The 15 papers included in this Special Publication composed a symposium entitled "Crop Tolerance to Suboptimal Land Conditions" that was presented in two parts on Dec. 1 and 2, 1976 at the 68th Annual Meetings of ASA, CSSA, and SSSA. Part I was entitled "Tropical or Subtropical Plants with Special Tolerance to Suboptimal Land Conditions" and Part II was concerned with the "Physiology of Plant Tolerance."

The committee that organized the symposium was composed of Dr. D. L. Plucknett, University of Hawaii, Chairman; Dr. D. E. Baker, The Pennsylvania State University; Dr. A. L. Fleming, Science and Education Administration, U. S. Department of Agriculture; and Dr. O. P. Engelstad, Tennessee Valley Authority. It is to their credit that a symposium with profound implications on future agricultural production in the world was conceived, organized, and successfully programmed. Of equal significance is that the committee foresaw the need to invite experts from many countries and climates to participate in the symposium.

Few textbooks offer as does this Special Publication an insight into the ecological and physiological relationships of different species growing under suboptimal conditions. In many cases the phenomena studied exhibit such complexity that both plant deficiencies and toxicities were observed for the same soil. Further, the responses varied markedly with the species and cultivars being studied, indicating considerable potential for crop improvement.

That we will soon need to use marginal lands as have other countries in the world, for more efficient crop and animal production, becomes more evident with each assessment of the world's future food needs. It seems timely, therefore, that this book be read by young agronomists throughout the world who will face the challenge of the seemingly ever increasing need for more food. We encourage these young scientists to seriously consider some of the approaches espoused by the authors and to join the authors in seeking answers to the many as yet unanswered questions that are raised throughout *Crop Tolerance to Suboptimal Land Conditions*.

Gerald A. Jung  
Editor