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Diversity of Soils in the Tropics

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Foreword

A great diversity of soils exists in the tropics. The frequent use of the term "tropical soils" tends to present these soils as having little variability and as having characteristics distinctly different from soils of other climates. This misconception hinders the optimum utilization of soils in the tropics since their potential is thereby misunderstood. Many soils of the tropics have properties in common with soils of temperate climates.

The purpose of this special publication is to present new information regarding the macro- and microdiversity of soils in the tropics in an effort to erase lingering misconceptions about their uniformity and unique characteristics. This publication contains papers presented in a special symposium held at the 1977 annual meetings of the American Society of Agronomy and Soil Science Society of America in Los Angeles. The symposium was cosponsored by divisions A-6, International Agronomy, and S-5, Soil Genesis, Morphology, and Classification.

In seven chapters, fifteen authors thoroughly cover the topics of spatial, macro-, micro-, and geographic variability as well as soil management, in terms of fertility levels and planting and harvesting schedules. We express appreciation to the authors. Thanks are also extended to the organizing committee consisting of John J. Nicholaides, III and Leslie D. Swindale, and to the editorial committee consisting of Matthew Drosdoff, Raymond B. Daniels, and John J. Nicholaides, III for their constant interest and concern for this publication throughout its preparation.

J. W. Pendleton, President
American Society of Agronomy

P. F. Pratt, President
Soil Science Society of America

Preface

The widespread use of the term "tropical soils" has led to the general misconception that soils of the tropics comprise a group of soils with common properties. These soils are often referred to erroneously as being synonymous with lateritic soils, laterites, or red soils. Although there are soils in the tropics that contain laterite (hardened ironstone) and red soils are common, most soils in the tropics do not have laterite nor are they red. To refer to "tropical soils" as an entity is as meaningless as the use of the term "temperate soils," which is rarely if ever used. Most people and certainly all soil scientists recognize the great range in the kinds of soils in the temperate regions but many people including some soil scientists do not fully appreciate the great diversity of soils in the tropics. Soil scientists with extensive experience in the tropics are convinced that there are more different kinds of soils in the tropics than in the temperate regions.

The papers presented herein, with the exception of the first, were given at the special symposium "Diversity of Soils in the Tropics" at the 1977 American Society of Agronomy meetings. One objective of the symposium in the view of the organizers was to change the lingering misconception of the commonness of soils of the tropics to the realization that soils of the tropics are as diverse as are those of the temperate zone. It is the hope of the organizers and editors that the blend of these seven papers conveys to the readers that a wide diversity of soils indeed exists within the tropics.

The introductory paper by L. P. Wilding gives a pedologist's overview of soil variability and has universal applicability. A. Van Wambeke and R. Dudal discuss broad categories of soils in the tropics as influenced by soil moisture regimes, age and weathering stage of parent materials, elevation above sea level as it affects vertical zonality, and the lithology of parent rocks. F. R. Moormann and B. T. Kang deal with the common occurrences and causes of microvariability and implications for agronomic research and field experimentation. R. W. Arnold and R. Schargel show the relationship between soil differences and geomorphic patterns in

landscapes in Venezuela where the mapping was done on a relatively large scale. The paper by S. W. Buol and W. Couto points up the spatial variability of the plow layer of soils within taxonomic units especially in the higher categories. B. A. Krantz, J. Kampen, and M. B. Russell discuss the large differences between Vertisols and Alfisols as related to management practices applied to the Hyderabad area in India. The paper by R. L. Fox and P. G. E. Searle illustrates the wide range of phosphate adsorption by different soils in the tropics and examines some of the factors involved.

The diversity of soils in tropical regions is clearly illustrated in the above papers although no attempt was made to cover the range of soil conditions that exist. These papers also illustrate the need for site-specific data in tropical regions before management problems can be determined and successfully overcome.

Matthew Drosdoff
Raymond B. Daniels
John J. Nicholaides, III
Editors

Leslie D. Swindale
John J. Nicholaides, III
Organizers