PLANT-SOIL INTERACTIONS AT LOW pH
Developments in Plant and Soil Sciences

VOLUME 45

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Plant-Soil Interactions at Low pH


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Preface

Soil acidity is a major limitation to crop production in many parts of the world. Plant growth inhibition results from a combination of factors, including aluminum, manganese, and hydrogen ion toxicities and deficiencies of essential elements, particularly calcium, magnesium, phosphorus, and molybdenum. Agricultural management practices and acid precipitation have increased acid inputs into the ecosystem and heightened concern about soil acidity problems. While application of lime has proved to be effective in ameliorating surface soil acidity in many areas, significant soil acidity problems still exist. Scientists from Alberta, Canada, recognized the need to provide a forum for researchers from different disciplines to exchange information and ideas on solving problems of plant growth in acid soils. As a result of their efforts, the First International Symposium on Plant-Soil Interactions at Low pH was held at Grande Prairie, Alberta, Canada, in July 1987.

In many acid soil areas, liming materials are not readily available, the cost may be prohibitive, or subsoil acidity cannot be corrected by surface application of lime. New management approaches involving both the plant and the soil are needed in these situations. Progress has been made in the selection and breeding of acid-tolerant plants. However, continued progress will be limited by our lack of understanding of the physiological and biochemical basis of differential acidity tolerance among plants. Soil test methods are needed to determine where toxicities will limit plant growth and to estimate the amount of lime or other amendments to be used alone or in combination with acid-tolerant plants to overcome the problem. Additional information is needed concerning the impact of soil acidity on nutrient-supplying power of the soil and nutrient uptake and utilization by plants. To this end, the effect of soil acidity on plant-microbial interactions and on microorganisms involved in nutrient cycling needs to be elucidated.

These and other topics related to plant growth in acid soils were addressed by 200 scientists from 30 countries at the Second International Symposium on Plant-Soil Interactions at Low pH, held at Pipestem Resort State Park, West Virginia, USA, from June 24–29, 1990. The symposium consisted of 180 oral and poster presentations in eight sessions. Major areas covered in the sessions included chemistry of acid soils, fertility of acid soils, management of acid soils, microbial relations in acid soils, physiology/biochemistry of acid stress tolerance in plants, identification of acid-tolerant plants, and genetics/breeding of acid-tolerant plants. The present Proceedings contain 122 refereed papers from the symposium. These research and review articles cover the latest developments on a wide range of topics related to soil acidity and plant growth.

The Third International Symposium on Plant-Soil Interactions at Low pH will be held in Queensland, Australia, in 1993. It is anticipated that the symposium will occur between June and September at a resort location in Queensland. Local organizers for the symposium will be Dr. D.G. Edwards, Department of Agriculture, University of Queensland, St. Lucia QLD 4067, Australia, and Dr. R.C. Bruce, Queensland Department of Primary Industries, Meiers Road, Indooroopilly QLD 4068, Australia.

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