Advances in Soil Science

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B.A. Stewart, Editor

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Preface

The study of soils today has taken on increased importance because a rapidly expanding population is placing demands on the soil never before experienced. This has led to an increase in land degradation. Land degradation is one of the most severe problems facing mankind. Volume 11 of *Advances in Soil Science* was devoted entirely to this critical area of soil science.

From the beginning of agriculture until about 1950, increased food production came almost entirely from expanding the cropland base. Since 1950, however, the yield per unit of land area for major crops has increased dramatically. Much of the increase in yields was because of increased inputs of energy. Between 1950 and 1985, the farm tractor fleet quadrupled, world irrigated area tripled, and use of fertilizer increased ninefold. Between 1950 and 1985, the total energy used in world agriculture increased 6.9 times.

Until recently, sustainability was seldom, if ever, mentioned in agricultural literature. Now, it is one of the most widely used terms. The high costs of irrigation development, escalating energy costs during the 1970s, public concern over potential negative impacts of fertilizer and pesticides on water supplies, soil erosion, soil compaction and salinity problems, and other concerns have caused many people to question whether many of the present agriculture systems can be sustained. As a result, soil science is beginning to focus more on sustaining the resource base. The productivity level of an agricultural soil at any point in time is the result of the interaction of degradative processes and conservation/reclamation practices that occur simultaneously. A sustainable system is any system in which the benefits from the soil conservation practices are equal to or greater than the negative effects of the soil degradative processes.

This series, *Advances in Soil Science*, was established to provide a forum for leading scientists to analyze and summarize the available scientific information on a subject, assessing its importance and identifying additional research needs. This goal seems even more appropriate today than in 1982 when the idea of the series was formulated. Much has been learned about our soil resources. The principles learned and the technology developed need to be used to increase food production and sustain the productivity of the resource base. *Advances in Soil*

Science fills a gap between the scientific journal and the comprehensive reference books. Scientists can delve in depth into a particular subject relating to soil science. Contributors are asked to develop and identify principles that have practical applications to both developing and developed agricultures.

Advances in Soil Science is international in scope and covers all subjects relating to soil science. This volume continues that format. Although we consider our audience to be primarily scientists and students of soil science, the series provides technical information to anyone interested in our natural resources and man's influence on these resources. Research in the future will focus on systems that are resource efficient and environmentally sound. The need to optimize crop production while conserving the resource base has never been greater.

The quick acceptance of *Advances in Soil Science* by both authors and readers has been very gratifying and confirms our perception that a need did exist for a medium to publish soil science reviews. I want to thank the authors for their excellent contributions and cooperation. I also want to thank members of the Editorial Board for their help in selecting such competent authors and the Springer-Verlag staff for their kind assistance and counsel. Last, and most important, I want to thank the readers for their acceptance and use of *Advances in Soil Science*.

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