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SOIL NITROGEN

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SOIL NITROGEN

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GENERAL FOREWORD

AGRONOMY—An ASA Monograph Series

The need for comprehensive treatments of specific subject matter areas in agronomy was realized by members of the American Society of Agronomy several years ago. As a result, the first monograph of a series entitled "Agronomy" was published in 1949. Dr. A. G. Norman, an eminent member of the Society, was appointed general editor. Since the Society, a nonprofit organization, was not initially able to finance the project, arrangements were made with Academic Press, Inc., of New York, to publish the monographs. These editorial and business arrangements were used for the first six monographs and this explains why the early volumes are available from Academic Press, Inc., and not available from the Society Headquarters Office in Madison, Wisconsin.

By 1957 the Society had developed considerably and had in operation a Headquarters Office with a competent editorial staff which made it possible to editorially manage its publications. Also, the improved financial stability of the Society enabled it to pursue independently the monograph project, including complete financing and publishing of the series.

The American Society of Agronomy now presents *Soil Nitrogen* as its tenth monograph. The timeliness of the topic is very much in evidence during this period when the manufacture and sales of nitrogen are increasing annually by enormous proportions. The importance of soil nitrogen in determining the needs for fertilizer nitrogen, its predominant direct effect as a nutrient on plant growth, and its direct and indirect influences on the utilization of other elements which markedly affect crop production make this contribution an invaluable one at this time.

This tenth number in this series was preceded only recently in 1965 by Monograph 9 on *Methods of Soil Analysis* which came in two parts, entitled: Part I—Physical and Mineralogical Properties, Including Statistics of Measurement and Sampling; and Part II—Chemical and Microbiological Properties. The subjects of "Oats and Oat Improvement" and "Drainage of Agricultural Lands" constituted Volumes 8 and 7, respectively. These publications were handled entirely by the American Society of Agronomy.

Monographs on other subjects are presently under preparation. Within a year, Number 11 on Irrigation will be available. Within two years, other numbers on Liming and Soil Acidity and on Wheat will be released. Still others are under consideration as assurance that the ASA Monograph program will remain active.

In view of the fact that some of the Monograph titles are largely in the area of soil science while others are mainly oriented to crop science, clarification of the relationship of the American Society of Agronomy to the Crop Science Society of America and the Soil Science Society of America may benefit our readers. The latter societies are actually outgrowths of the American Society of Agronomy. A close association is maintained among the three societies since members of CSSA and SSSA are automatically given membership in ASA. The three societies, incorporated in Wisconsin, work harmoniously together and share a Headquarters Office and staff in Madison,

Wisconsin. In view of the many mutual professional and scientific objectives of the three groups, the readiness of the American Society of Agronomy to publish subject matter in these areas is understandable.

August 1965

MATTHIAS STELLY,
Executive Secretary-Treasurer
American Society of Agronomy
Crop Science Society of America
Soil Science Society of America

FOREWORD

Soil nitrogen is prominent among the many nutrients essential for crop growth and has probably received more study and attention than any other. Nitrogen occupies a unique position among the major nutrients because it occurs only in trace amounts in soil parent materials but is required by plants in relatively large quantities. At a time when food production is an increasing concern in the world, a monograph on the general subject of soil nitrogen is pertinent and timely.

Cropping systems have been much influenced by the availability of synthetic nitrogenous fertilizers and it appears that this trend will continue with the steadily increasing efficiency of chemical technology.

A major objective of modern soil science and agronomy is to put together farm management systems that will maximize the efficiency of food production and reduce costs. This monograph summarizes known facts and principles for an important component of the system and therefore will find extensive application and use.

The wide range of subject matter specialization among the members of the American Society of Agronomy, along with the skills and facilities of the Society Headquarters, makes possible a comprehensive treatment like this monograph on soil nitrogen. We are much indebted to the authors and editors for their willingness and years of effort to produce this book.

16 April 1965

L. A. RICHARDS, *President*
American Society of Agronomy

PREFACE

Soil Nitrogen is published with the hope that it will mark the beginning of an era of better understanding of the many problems involved in the chemistry and utilization of nitrogen in the soil. Exposition and evaluation of past work often serve to bring a degree of order and perspective to extensive existing information and to point the way to further research. This monograph will serve its purpose well if a better understanding of what is currently known about soil nitrogen is disseminated among agriculturalists. The authors and editors have no illusions that the current volume will provide answers to all the innumerable questions about soil nitrogen.

This monograph is not intended to present an exhaustive survey of the literature nor to present uniform detail in review coverage within the sixteen chapters. *Soil Nitrogen* is to be viewed as a collection of chapters written by competent authors who treated their subject as they considered best. No attempt was made by the editors to influence the treatment of subject matter nor to reconcile differences of opinion among the authors. Although few workers are authorities on even one aspect of soil nitrogen, the editors, nevertheless, believe that the competent and qualified individuals selected provide the coverage needed to correlate current knowledge and to stimulate further research.

The monograph had its formal beginning in 1957 at the American Society of Agronomy meeting in Atlanta, Georgia. A committee under the chairmanship of W. P. Martin held the first of several discussions that led in 1959 to petitioning the Society for approval of this monograph. Following such authorization, W. V. Bartholomew was elected editor-in-chief and an enlarged steering committee was appointed to advise on subject matter organization and selection of contributors.

In planning and preparation of the monograph many individuals became involved and made noteworthy contributions. In addition to the authors of chapters, who contributed their enthusiasm in planning, monumental efforts in writing, and cooperation and patience during the editorial processes, others to whom acknowledgment is made include W. P. Martin, J. E. Dawson, A. G. Norman, and L. E. Orth as members of the original steering committee who did not write chapters; R. L. Balser, C. F. Eno, L. R. Frederick, J. M. MacGregor, J. L. Mortensen (deceased), R. W. Pearson, and E. L. Schmidt of the enlarged steering committee; and G. Chesters, A. P.

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W. V. BARTHOLOMEW
March 4, 1965 F. E. CLARK

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