



Analysis of the
Composition and Properties of

SOILS

Tropics and Subtropics

J. Singh Raghav, V. I. Savich,
N. G. Yekolov, V. A. Krupnov

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Edited by

Professor V. G. Lareshin

Associate Professor N. G. Vukolov



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Phone: 91-0291-2643993, 2643994, Fax: 2642319

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The book examines the specific properties of soils in the tropics and subtropics, a generalization of the published data on the methods of studies of the physico-chemical and chemical properties of soils (absorption capacity, acidity, alkalinity, humus status, salinity and alkalinity, the content of macro-and micronutrients) are a classification on the availability of soil elements, depending on the composition, properties of soils and cultivated crops.

For specialists in the field of soil science, agricultural chemistry, agricultural specialties for students enrolled in the direction "Agriculture".

Authors:

J. Singh Raghav, V. I. Savich, N. G. Vukolov, V. A. Krupnov

Editor: V. G. Lareshin, N.G.Vukolov

Reviewers:

Doctor of Agricultural Sciences Professor V. Belobrov

Doctor of Geographical Sciences Professor N. Mineeva

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Preface

This work is the outcome of cooperation between the People Friendship University of Russia and Russian State Agrarian University Timiriazev. This volume is faithfully dedicated to the principles of soil science.

Soil, water and air supply the chemical elements needed for plant growth. Nutrient elements essential to the chemical reactions that occur within the plant are taken up from the soil through the roots.

Plants need three soil-derived nutrient elements in large amounts-nitrogen, phosphorus and potassium. These elements are frequently not available in adequate amounts from soil.

Although these basic processes are understood, there is need to know much more about nutrient cycling and the behavior of nitrogen under various environment conditions. To accomplish this, progress is needed in estimating the rates of biological reactions that control nitrogen transformation in soil.

The amount of phosphorus in solution in soil water determines the availability of phosphorus for plants. There is often a substantial amount of phosphorus in agricultural soils, but it is in a form that relies phosphorus to the surrounding soil water in a slow equilibrium reaction. In soil, the soluble phosphorus in fertilizer quickly reacts with aluminum and iron oxide and with calcium to form compounds that are relatively insoluble and slowly available to plants. Moreover, phosphate quickly binds to clay colloids.

Weathering of mineral has supplied many soil in subhumid or arid regions with adequate levels of available potassium. Potassium is available in soil water solution in an equilibrium reaction with exchangeable and fixed potassium in the soil.

In addition to these three nutrients, other soil-supplied nutrients are essential to plant growth and development: copper, iron, boron, magnesium, calcium, sulfur, zinc, chlorine, manganese, cobalt and molybdenum. These elements are needed in small amounts that are often available in soil.

Organic matter in soils influences plant growth in a number of ways. The greatest benefits of organic matter in soil are its water-holding capacity for binding and releasing some mineral nutrients.

Finally, the collection and analysis of the quantities in this report could not have been accomplished without the assistance of MMTK (Mining and

Metallurgical Titanium Company) general director J. Singh Raghav. The work of J. Singh Raghav is particularly appreciated.

Scientific Editor V. Lareshin.

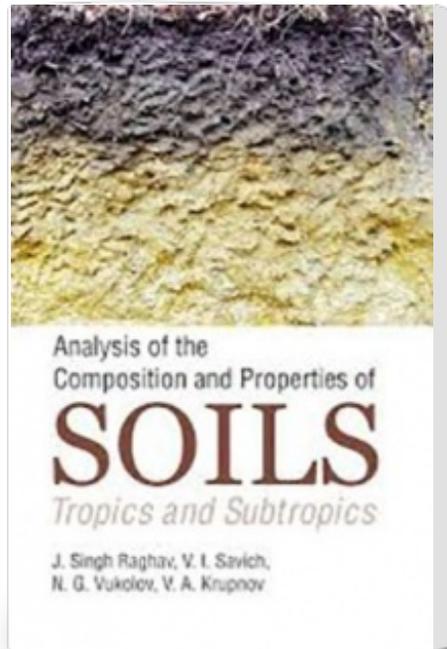
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VA, Savich NG

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