
Soil Fertility Management for Sustainable Development

Deepak G. Panpatte • Yogeshvari K. Jhala
Editors

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 Springer

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ISBN 978-981-13-5903-3 ISBN 978-981-13-5904-0 (eBook)
<https://doi.org/10.1007/978-981-13-5904-0>

Library of Congress Control Number: 2019931837

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The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Preface

Soil is the vital element of earth, and its fertility is very important for supporting all the living forms. Soil fertility is the capacity to receive, store, and transmit energy to support plant growth. These processes require healthy soils – living, self-organizing systems with physical, chemical, and biological components all functioning and in balance. During the era of green revolution, there was an increase in agricultural production. Meanwhile, to increase production, there was an increase in the use of chemical-based agro-inputs which disturbed natural balance of soil. The long recommended use of fertilizers, pesticides, and other synthetic chemicals to address problems in agricultural production has been leading to poor soil health and resistance in insects, diseases, and weeds. Presently, cultivators are using chemical agro-inputs and totally ignoring delicate balance of humus, microbes, trace minerals, and nutrients in the soil which results in soil degradation resulting in reduction in the capacity of the soil to feed plants.

Good management of soils ensures balance of physical, chemical, and biological properties of soil, and that's how appropriate mineral elements enter the food chain. For maintaining crop productivity, environmental sustainability, and healthy living beings, the management of soil is of prime importance. In many communities of the world, soil is being worshiped like a mother as it is nurturing life. To achieve the goal of sustainability of agro-ecosystem and food security, soil fertility management in sustainable manner reduction of soil degradation is the challenge. Soil management in the soil is supported by better organic carbon content, suitable mineral balance, and a varied and copious soil life. Biological components of soil help in building and maintenance of soil structure and functioning.

The book entitled *Soil Fertility Management for Sustainable Development* addresses the important aspects of soil fertility management, with the help of reputed national and international scientists working in the field of soil fertility management. Each chapter will emphasize on the mechanism of action and recent advances in the techniques for improvement of soil fertility. The outlooks of the authors are methodical and firm based on their own experiences during their carrier in the field of soil fertility management. I hope this book will be extremely useful to

the researchers in the field of agriculture especially those who are working on the development of newer strategies for soil fertility management as a source of valuable information.

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Introduction

Soil fertility is the stepping stone for determining productivity of all farming systems. Generally, our interpretation for the term soil fertility is the “capacity of soil to provide nutrients to the crop.” If we look at a wider scenario, then soil fertility does not only mean to provide nutrients, it also includes the capacity to support plant growth as well as physical, chemical, and biological properties of the soil. There exists a delicate balance between three main components of soil fertility, i.e., physical, chemical, and biological. Indiscriminate use of agrochemicals like synthetic fertilizers, insecticides, fungicides, and herbicides upsets the delicate equilibrium between the three components of soil fertility. The intension of soil fertility management is to improve soil buffering capacity to reduce soil degradation, improvement of soil nutrient status by biological nutrient cycling. If we look at the present scenario, people are just thinking about the nutrient status of the soil and nobody seems to be worried about the physical and biological properties of the soil. Fertile soil in true sense can be defined as a soil comprising of well-balanced nutrients, high organic matter with good physical strength, and abundant soil life. The biology of soil, i.e., microorganisms and macroorganisms is the prime indicator of soil health. So, looking to the present scenario management of soil fertility in sustainable manner is demand of the time, and we seriously have to work hard for this; otherwise, in the near future, our soils will become barren with no capacity to support the life.

The present book enriches our knowledge about the various aspects of soil fertility management including microorganism-based strategies, the use of organic manures, biochar, seaweed, and mulching as well as site-specific nutrient management system for enhancement of soil fertility. The readers will be enriched with a detailed account of all the aspects that are required for making a soil “fertile.” The views of the authors are thorough and authoritative based on their long research experience in the subject area. We hope that this book will be very useful for all those who are actively involved in the research on soil fertility management for apprehending its benefit in sustainable agricultural productivity.

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Contents

1	Phosphorus Capture, Immobilization and Channeling Through Algae for a Sustainable Agriculture	1
	D. M. Mahapatra, R. Mahapatra, L. Singh, H. J. Kadhum, G. S. Murthy, H. N. Chanakya, N. V. Joshi, and T. V. Ramachandra	
2	Site Specific Nutrient Management Through Nutrient Decision Support Tools for Sustainable Crop Production and Soil Health	13
	Shiveshwar Pratap Singh	
3	Carbon Sequestration for Soil Fertility Management: Microbiological Perspective	25
	Rahul Mahadev Shelake, Rajesh Ramdas Waghunde, Pankaj Prakash Verma, Chandrakant Singh, and Jae-Yean Kim	
4	Strategies to Improve Agriculture Sustainability, Soil Fertility and Enhancement of Farmers Income for the Economic Development	43
	Priyanka Verma, Dheer Singh, Ishwar Prasad Pathania, and Komal Aggarwal	
5	Integrated Soil Fertility Management	71
	Sarita K. Yadav and Ruchi Soni	
6	Soil Quality Status in Different Region of Nepal	81
	Anup K C and Ambika Ghimire	
7	Soil Fertility Improvement by Symbiotic Rhizobia for Sustainable Agriculture	101
	Satyavir S. Sindhu, Ruchi Sharma, Swati Sindhu, and Anju Sehrawat	
8	Sustainable Soil Management Practices in Olive Groves	167
	Victor Kavvadias and Georgios Koubouris	

9	Microbiome of Rhizospheric Soil and Vermicompost and Their Applications in Soil Fertility, Pest and Pathogen Management for Sustainable Agriculture	189
	Rayakumar Pathma, Gurusamy Raman, and Natarajan Sakthivel	
10	An Insight into Mycorrhiza Involved in Building Soil and Plant Health	211
	M. Ranganathswamy, Gajanan L. Kadam, and Yogeshvari K. Jhala	
11	Mulching: A Sustainable Option to Improve Soil Health	231
	Christopher Ngosong, Justin N. Okolle, and Aaron S. Tening	
12	Prospects of Organic Farming as Financial Sustainable Strategy in Modern Agriculture	251
	Ruchi Soni and Sarita K. Yadav	
13	Perspectives of Seaweed as Organic Fertilizer in Agriculture	267
	B. L. Raghunandan, R. V. Vyas, H. K. Patel, and Y. K. Jhala	
14	Integrated Soil Fertility Management Options for Sustainable Intensification in Maize-Based Farming Systems in Ghana	291
	Samuel Adjei-Nsiah	
	Correction to: Soil Quality Status in Different Region of Nepal	C1

About the Editors

Dr. Deepak G. Panpatte has been working as a research scholar for the past 7 years. His research interests include agriculturally beneficial microorganisms such as biofertilizers, biopesticides and biodegraders. Done pioneering work for development of fortified biocontrol bacterial consortium with phyto-extracts for management of phytopathogenic nematodes and fungi. He has received 5 awards for presentation of research outcomes in International conferences and Rastiya Gaurav Award for outstanding contribution in agriculture. His publication profile includes 14 research papers, 2 books & 9 book chapter with Springer publishing house, 1 practical manual, 26 popular articles and 2 editorial pages.

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