Composting of Farm Residues by Nature-Based Solutions

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Composting of Farm Residues by Nature-Based Solutions

A Potential Key Towards Sustainable Agricultural Practices

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Preface

The present book entitled *Composting of Farm Residues by Nature-Based Solutions: A Potential Key Towards Sustainable Agricultural Practices* focuses on sustainable management of residues produced by various agriculture establishments including chicken farms, cattle farms, and horticulture/crops farms. Composting of organic residues involves a complex microbial dynamic and their interaction to decompose the organic matter. During this process, not only large amounts of greenhouse gases and ammonia are released to environment but the nutrient losses have also been recorded. Several new models have been evolved in the past decade to address these issues. Additionally, the nature-based solutions have been major attraction in recent European green deal to develop the sustainable practice toward improved environment health. This book focuses on a comprehensive exploration of evolution of composting techniques from traditional to modern methodologies.

The primary objective of this book is to disseminate the recent advances made in composting process to reduce the greenhouse gas emissions and restore the available nutrients under field conditions. The end product compost may reduce heavily the chemicals used in agriculture sector and restore the physio-chemical properties of soil by improving the natural microbial community toward normal state. Developing such practices by including nature-based solutions may foster the agriculture units/farms in a self-sustainable model while creating a big impact to environment health in a bigger picture. The book aims to fill the gap between scientific community, agriculture farmers, stakeholders, common peoples, and policymakers, for better understanding of risks associated with composting and their sustainable mitigation for maximum benefits in agriculture to create a better tomorrow.

This book emphasizes to explore the nature-based solutions to improve the composting process instead of synthetic chemical-based components. Unlike the other works that focus mainly on compost applications in field, this book includes the mechanisms of composting to application in a more environment-friendly manner to improve the sustainability and restore the soil and environmental health. The book also focuses to maximize the nutrient availability in the compost by

reducing the losses during the process. Several new bio-based materials and micro-organisms have been tested for this purpose and may potentially transform the composting science. The book also dedicates specific chapter to assess the potential risks in depth and provides guidelines for safer implementation in agriculture to minimize the negative effects for human as well as environmental health. Although significant improvements have been made in composting, monitoring, management, and application to the field since the past decade, the book addresses the potential challenges and opportunities and further encourages researchers to overcome and achieve the maximum positive impacts.

Overall, the book presents a holistic approach to sustainably manage the residues from agriculture farming sector to reduce greenhouse gases, restore nutrient loss, improve physiochemical properties of soil by application of compost to the fields, and improve the crop physiology for better production and reduced chemicals use. The book brings the key factors to develop self-reliance by reducing the dependency on chemical-based fertilizers and overall improvement of total environment.

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About the Book

The book entitled *Composting of Farm Residues by Nature-Based Solutions: A Potential Key Towards Sustainable Agricultural Practices* brings a wider understanding of problems and solutions regarding agriculture waste produce and their sustainable management. High demand of agriculture products forced this industry to meet the requirement: thus, high amount of organic residues is being generated. Management of this organic residue is of utmost importance to avoid environmental hazards, but also to recycle this material into compost to boost the circular economy. The composting is a complex process, during which a large amount of greenhouse gases and ammonia is released as pollutants, which also means the nutrients lost in the final compost. The new nature-based solutions to combat and address this issue is major need in recent European green deal toward improved environment health. Thus, this book intends to explore the various stages of complex composting process including traditional and modern technologies.

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Nanotechnology Advances in Composting

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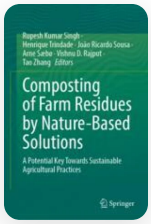

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Abstract

Nanotechnology is now developing and growing more quickly across a variety of industries. Nanoparticles (NPs) enter the composts in various ways as a result of this development. First, NPs may inadvertently enter composts through surface runoff, buried solid waste, waste discharge, or direct dumping into waste (food, medicine, consumer goods, and personal care items). Second, a novel strategy created to speed up waste breakdown and act