

Food Waste Composting Researchgate

With the increased interest in and demands for compost from commercial horticultural industries, composting is on the verge of becoming an economically feasible option for waste management. While horticultural producers can create some of the compost to meet their own needs, demand has grown beyond what they can supply for themselves and others. Compost Utilization in Horticultural Cropping Systems gives you the tools to meet the needs of this growing industry. Consider these statistics: Americans generate about 200 million megagrams of municipal solid waste per year The agricultural market for compost could reach over 680 million m³ per year Two horticultural areas together account for over 50% of compost use: landscaping (31%) and food crop production (25%) Now consider this: Proven benefits of compost use, including plant disease suppression, better moisture retention, supplying plant nutrients, and building soil organic matter Increased pressure on peat supplies and wider availability of compost products Creation of composting enterprises by the horticultural industry in response to its own needs, rising disposal fees for organic waste, and consumer demand for compost at retail centers The first book to establish a composite of the existing scientific knowledge on the use of compost in commercial horticultural enterprises, Compost Utilization in Horticultural Cropping Systems gives you a comprehensive review of the production, use, and economics of compost. It covers production methods, compost quality and the parameters associated with its measurement, and the biological, chemical, and physical processes that occur during composting. Rather than searching for information in various places, now you can find all the information you need in one convenient source.

The dramatic worldwide increase in agricultural and industrial productivity has created severe environmental problems. Soil and groundwater reservoirs have been polluted with pesticides, xenobiotics and agro-chemicals. The global consensus to reduce inputs of chemical pesticides and agrochemical fertilizers, which are perceived as being hazardous by some consumers, has provided opportunities for the development of novel, benign sustainable crop management strategies. The future of agriculture depends upon our ability to enhance the productivity without damage to their long-term production potential. One of the strategies is the application of effective microbial products beneficial for both farmers and ecosystems. This kind of approach can ensure both ecological and economic sustainability. Soil microbial populations are immersed in a framework of interactions, which are known to affect plant fitness and soil quality. For the betterment of life of human beings, improved quality and variety of products are formed due to the versatile action of different groups of microorganisms. Microbes are able to degrade solid waste material into compost which is a mixture of decayed organic matter, manure etc. Incomplete microbial degradation of organic waste where the microbial process varies from aerobic to anaerobic form is stated as compost, if added to soil improves plant growth and development. The biological activities and microbial metabolism in the soil contribute to alter its mixture and fertility. Incorporation of organic remains in the form of compost is known to influence favourably the physio-chemical and biological properties of soil. The beneficial activities bestowed upon plants by compost utilization are multifaceted, hence most promising alternatives for achieving sustainable agricultural production. An increased awareness on compost has led to their use in agriculture. Contents in the present book will comprise various chapters on the role of beneficial bacteria in the composting process. The

application is depicted to achieve the attainable productivity besides, in disease management and suppressiveness of organisms of phytopathogenic in nature. Significance of the compost elicits certain responses e.g. soil reclamation, soil fertility, soil health and disease management exhibit due to quality compost amendment in soil. It serves as low cost prospective option for sustainable crop production and protection.

The main aim of this book is to bridge the gap between aerobic and anaerobic waste treatments by concentrating on studies of earthworms. In particular, vermicomposting is being discussed as well as its properties and applications. Other subjects touch on the treatment of palm oil mill effluents, the various importance of earthworms, its scope and future aspects of earthworm research, and the impact of waste management practices on human health.

Composting is a widely used biological process for the management of some wastes produced in communities and agricultural activities, which have experienced substantial growth during the last few years. Because this and the knowledge of composting has increased, the number of composting facilities has increased tremendously, especially in some European countries. Interest has also increased in several countries in other regions of the world. Compost Science and Technology attempts to summarize some of the most important work conducted during the last few years under one cover. The contributions to the publication are made by some of the most qualified professionals in the world and present the information in a clear and objective manner. The readers will find the information very useful and will be helpful in the design of new facilities and organic recycling programs. The manager or interested member of the community does not have to have a rigorous training in science or technology. Up-to-date contributions by some of the most knowledgeable and respected leaders in the field Clear and

objective presentations, which are arranged in such a way that it is not necessary to read the entire book. Information is supported by data, tables and references. Covers most important aspects of the process including a brief historical review. May be used by teachers as well as practitioners in the field.

Composting is increasingly used as a recycling technology for organic wastes. Knowledge on the composition and activities of compost microbial communities has so far been based on traditional methods. New molecular and physiological tools now offer new insights into the "black box" of decaying material. An unforeseen diversity of microorganisms are involved in composting, opening up an enormous potential for future process and product improvements. In this book, the views of scientists, engineers and end-users on compost production, process optimisation, standardisation and product application are presented.

The Science of Composting
CRC Press

Zero Waste: Management Practices for Environmental Sustainability presents approaches for resource management centered on reducing waste and reusing and recycling materials. It aims to save energy by reducing energy consumption associated with extracting, processing, and transporting raw materials and waste, and also to reduce and eventually eliminate the need for landfills and incinerators. This book presents the various principles, methods, and tools that can be used to address different issues in the areas of industrial waste reduction and sustainability. It examines how to eliminate waste at the source and at all points of a supply chain, and how to shift from the current one-way linear resource model to a sustainable "closed-loop" system. Proposes strategies for businesses to reduce and reuse waste with a goal of reaching a zero waste status. Focuses on how mitigating waste and promoting recycling can

save vast amounts of energy. Explains how the zero waste approach would be a key measure to ensure environmental sustainability and help to offset global climate change.

Plant production in hydroponics and soilless culture is rapidly expanding throughout the world, raising a great interest in the scientific community. For the first time in an authoritative reference book, authors cover both theoretical and practical aspects of hydroponics (growing plants without the use of soil). This reference book covers the state-of-the-art in this area, while offering a clear view of supplying plants with nutrients other than soil. Soilless Culture provides the reader with an understanding of the properties of the various soilless media and how these properties affect plant performance in relation to basic horticultural operations, such as irrigation and fertilization. This book is ideal for agronomists, horticulturalists, greenhouse and nursery managers, extension specialists, and people involved with the production of plants. *

- * Comprehensive discussion of hydroponic systems, irrigation, and control measures allows readers to achieve optimal performance
- * State-of-the-art book on all theoretical aspects of hydroponics and soilless culture including a thorough description of the root system, its functions and limitation posed by restricted root volume
- * Critical and updated reviews of current analytical methods and how to translate their results to irrigation and fertilization practices
- * Definitive chapters on recycled, no-discharge systems including salinity and nutrition management and pathogen eradication
- * Up-to-date description of all important types of growing media

The world population is expected to increase exponentially within the next decade, which means that the food demand will increase and so will waste production. The increasing demand for food as well as changes in consumption habits have led to the

greater availability and variety of food with a longer shelf life. However, there is a need for effective food waste management and food preservation as wasted food leads to overutilization of water and fossil fuels and increasing greenhouse gas emissions from the degradation of food. The Research Anthology on Food Waste Reduction and Alternative Diets for Food and Nutrition Security explores methods for reducing waste and cutting food loss in order to help the environment and support local communities as well as solve issues including that of land space. It also provides vital research on the development of plant-based foods, meat-alternative diets, and nutritional outcomes. Highlighting a range of topics such as agricultural production, food supply chains, and sustainable diets, this publication is an ideal reference source for policymakers, sustainable developers, politicians, ecologists, environmentalists, corporate executives, farmers, and academicians seeking current research on food and nutrition security. This book is a guide to the principles and practice of organic waste recycling, it addresses low-cost waste recycling technologies utilising microbial and natural processes. A wide range of topics is covered, opening with a discussion of the need for and the problems involved in organic waste recycling. The characteristics of a number of organic waste materials from a variety of sources, and the pollution and health risks which may be associated with them are described. The central core of the book presents a broad range of technologies used in the recycling of organic waste materials to produce valuable products such as : fertiliser, biogas, algae, fish and irrigated crops.

Each recycling technology is described with respect to : objectives, benefits and limitations, environmental requirements, design criteria of the process, use of recycled products and public health aspects. This second edition has been completely revised and up-dated. It includes new sections on: waste minimisation and clean technology, application of constructed wetlands and regulatory aspects of waste disposal and recycling. Case studies of successful waste recycling programs are included and exercises for solving both theoretical and practical problems are given.

This book gathers papers presented at the International Conference on Advanced Intelligent Systems for Sustainable Development (AI2SD-2018), which was held in Tangiers, Morocco on 12–14 July 2018. It highlights how advanced intelligent systems have successfully been used to develop tools and techniques for modeling, prediction and decision support in connection with the environment. Though chiefly intended for researchers and practitioners in advanced intelligent systems for sustainable development, the book will also be of interest to those working in environment and the Internet of Things, environment and big data analysis, summarization, prediction, remote sensing & geo-information, geophysics, marine and coastal environments, and sensor networks for environment services.

This booklet provides a list of success and sustainability indicators for primary solid waste collection systems.

This book presents advanced knowledge and techniques to improve food quality, such

as organic farming, fertilization using waste, reducing arsenic in food, soil restoration, forage production in arid regions and weed control. Agriculture is actually facing two major challenges, feeding an ever-growing population and providing safe food in the context of pollution, climate change and the future circular economy.

This project was initiated by the Nordic Council of Ministers and its waste prevention group. The background to the project is that waste prevention is the highest priority in the waste hierarchy according to the EU Waste Directive. One other reason is the heavily increasing discussions in society on food waste in general. The project has been focusing on amounts of food waste, causes for food waste generation and initiatives to reduce the amounts of food waste from the retail and wholesale sector. Furthermore it gives some recommendations to measures that could be taken to change the present situation.

The magnitude of the food-waste disposal problem cannot be understated. Utilisation of food waste is of concern to the food processing industry, consumers, environmentalists, and regulators of handling and disposal systems. Food waste is not consistent in quality, is usually high in moisture content, and is only available locally. This book focuses on the challenges of utilising both wet and/or processed food waste. The regulatory environment relating to food waste, the perspective of the end-users, and practical use as animal feed is also discussed. One of the goals of this publication, other than to give a clear explanation of the subject of food waste and its uses as

animal feed, is to stimulate a need for research.

A manual on compost making. Described are: principles of composting, materials for composting, practical composting processes, uses of composts, environmental aspects, economic and social aspects, education and training of farmers and extension workers
This book focuses on the crucial sustainability challenge of reducing food waste at the level of consumer-society. Providing an in-depth, research-based overview of the multifaceted problem, it considers environmental, economic, social and ethical factors. Perspectives included in the book address households, consumers, and organizations, and their role in reducing food waste. Rather than focusing upon the reasons for food waste itself, the chapters develop research-based solutions for the problem, providing a much-needed solution-orientated approach that takes multiple perspectives into account. Chapters 1, 2, 12 and 16 of this book are available open access under a CC BY 4.0 license at link.springer.com

FROM THE PREFACE The main objective of composting is to transform organic materials into a stable usable product. Often organic materials which may have limited beneficial use in their raw state or have regulatory disposal constraints can be transformed by composting into marketable products. The limits on beneficial reuse may be regulations or they may be due to the potential for

materials to be putrescible or pathogenic. Composting can be a solution for each of these. The implementation of composting on a large scale (in contrast to home or backyard composting) involves materials handling. Technological implementation of composting must be consistent with the biological demand of the system. If the biological system is violated, conditions will not be optimized for composting, and problems such as odor generation, insufficient aeration or moisture, or a combination of these conditions may result. Past problems and closure of facilities have been largely due to violations of the biological systems. Product quality with respect to particle size, inclusions, moisture content and other physical aspects are a function of engineering design. A well designed system must have the biological and engineering principles in harmony at all times.

Energy recovery from waste resources holds a significant role in the sustainable waste management hierarchy to support the concept of circular economies and to mitigate the challenges of waste originated problems of sanitation, environment, and public health. Today, waste disposal to landfills is the most widely used methodology, particularly in developing countries, because of limited budgets and lack of efficient infrastructure and facilities to maintain efficient and practical global standards. As a consequence, the dump-sites or non-sanitary

landfills have become the significant sources of greenhouse gases emissions, soil and water contamination, unpleasant odors, leachate, and disease spreading vectors, flies, and rodents. However, waste can be utilized to produce a range of potential products such as energy, fuels and value-added products under waste biorefineries. A holistic and quantitative view, such as waste biorefinery, on waste management must be linked to the actual country, taking into account its socio-economic situation, local waste sources, and composition, as well as the available markets for the recovered energy and products. Therefore, it is critical to understand that solutions cannot be just copied from one region to the others. In fact, all waste handling, transportation, and treatment can represent a burden to the cities' environment and macro and micro economics, except for the benefits obtained from recovered materials and energy. Equally significant is a clear and quantitative understanding of the industrial, and public potential of utilizing recovered materials and energy in the markets as these can be reached without exacerbating the environmental issues using excessive transport. The book explores new advancements and discoveries on the development of emerging waste-to-energy technologies, practical implementation, and lessons learned from sustainable wastemanagement practices under waste biorefinery concept, which will accelerate the growth of circular economies in the world. The

articles presented in this book have been written by expert researchers and academics working in institutions at different countries across the world including Germany, Greece, Japan, South Korea, China, Saudi Arabia, Pakistan, Indonesia, Malaysia, Iran, and India. The research articles have been arranged into three main subject categories; 1) Resource recovery from waste, 2) Waste to energy technologies and 3) Waste biorefineries. This book will serve as an important resource for research students, academics, industry, policy makers, and government agencies working in the field of integrated waste management, energy and resource recovery, waste to energy technologies, waste biorefineries etc. The editorial team of this book is very grateful to all the authors for their excellent contributions and making the book successful.

This book provides an essential overview of sustainable development research in Mexico. It discusses the empirical research methods and findings, as well as practical initiatives and projects being pursued in Mexico and other countries in the region. Although a number of Mexican universities are now conducting high-quality research on matters related to sustainable development, there are few publications that offer a multidisciplinary overview of research efforts for a broader audience. This book addresses that gap in the literature, providing researchers at Mexican universities – including those from other countries

working in Mexico – with an opportunity to present their work, i.e. curriculum innovations, empirical work, activities, case studies, and practical projects. As such, it fosters the exchange of information, ideas and experiences, successful initiatives and best practices.

This is the third volume of the ISEKI-Food book series. It deals with the main features of utilization of the food industry waste, defined thereby as by-product, and the treatments necessary to discard waste to environmental acceptors. It discusses the utilization of byproducts of plants and fish, and presents case studies on waste treatment in the food industry.

This fourth edition of Organic Waste Recycling is fully updated with new material to create a comprehensive and accessible textbook: - New chapter on constructed wetlands for wastewater and faecal sludge stabilization. - New sections on: waste recycling vs. climate change and water; faecal sludge and its characteristics; hydrothermal carbonization technology; up-to-date environmental criteria and legislation and environmental risk assessment. - New case studies with emphasis on practices in both developed and developing countries have been included, along with more exercises at the end of chapters to help the readers understand the technical principles and their application. - Novel concepts and strategies of waste management are presented. - Up-to-date

research findings and innovative technologies of waste recycling program are provided. This textbook is intended for undergraduate and graduate students majoring in environmental sciences and engineering as well as researchers, professionals and policy makers who conduct research and practices in the related fields. It is essential reading for experts in environmental science and engineering and sustainable waste reuse and recycling in both developed and developing countries.

This book provides a comprehensive review of biosynthetic approaches to the production of industrially important chemicals and the environmental challenges involved. Its 19 chapters discuss different aspects of biosynthetic technology from the perspective of leading experts in the field. It covers various biorefinery approaches, including the use of microbes, metabolically engineered plants, biomass-based and green technology methods. Further, it examines important research in the areas of organic and hazardous waste composting, management and recovery of nutraceuticals from agro-industrial waste, biosynthesis and technological advancements of biosurfactants and waste water bioremediation. This book contributes to the scientific literature on biosynthetic technologies and the related environmental challenges for researchers and academics working in this area around the globe.

A deeper insight into the complex processes involved in this field, covering the biological, chemical and engineering fundamentals needed to further develop effective methodologies. The book devotes detailed chapters to each of the four main areas of environmental biotechnology -- wastewater treatment, soil treatment, solid waste treatment, and waste gas treatment -- dealing with both the microbiological and process engineering aspects. The result is the combined knowledge contained in the extremely successful volumes 11a through 11c of the "Biotechnology" series in a handy and compact form.

The ultimate in recycling, composting has been in use in some form since ancient times. A well-managed composting facility should exist as a good neighbor contributing to ecology. However, since local populations often perceive risks if a composting facility is built nearby, composting facilities must be designed and operated with minimal odor, dust

Solid waste management affects every person in the world. By 2050, the world is expected to increase waste generation by 70 percent, from 2.01 billion tonnes of waste in 2016 to 3.40 billion tonnes of waste annually. Individuals and governments make decisions about consumption and waste management that affect the daily health, productivity, and cleanliness of communities. Poorly managed waste is contaminating the world's oceans, clogging drains and causing flooding, transmitting diseases,

increasing respiratory problems, harming animals that consume waste unknowingly, and affecting economic development. Unmanaged and improperly managed waste from decades of economic growth requires urgent action at all levels of society. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050 aggregates extensive solid waste data at the national and urban levels. It estimates and projects waste generation to 2030 and 2050. Beyond the core data metrics from waste generation to disposal, the report provides information on waste management costs, revenues, and tariffs; special wastes; regulations; public communication; administrative and operational models; and the informal sector. Solid waste management accounts for approximately 20 percent of municipal budgets in low-income countries and 10 percent of municipal budgets in middle-income countries, on average. Waste management is often under the jurisdiction of local authorities facing competing priorities and limited resources and capacities in planning, contract management, and operational monitoring. These factors make sustainable waste management a complicated proposition; most low- and middle-income countries, and their respective cities, are struggling to address these challenges. Waste management data are critical to creating policy and planning for local contexts. Understanding how much waste is generated—especially with rapid urbanization and population growth—as well as the types of waste generated helps local governments to select appropriate management methods and plan for future demand. It allows governments to design a system with a

suitable number of vehicles, establish efficient routes, set targets for diversion of waste, track progress, and adapt as consumption patterns change. With accurate data, governments can realistically allocate resources, assess relevant technologies, and consider strategic partners for service provision, such as the private sector or nongovernmental organizations. *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050* provides the most up-to-date information available to empower citizens and governments around the world to effectively address the pressing global crisis of waste. Additional information is available at <http://www.worldbank.org/what-a-waste>.

The last 20 years have seen a burgeoning of social scientific and historical research on food. The field has drawn in experts to investigate topics such as: the way globalisation affects the food supply; what cookery books can (and cannot) tell us; changing understandings of famine; the social meanings of meals - and many more. Now sufficiently extensive to require a critical overview, this is the first handbook of specially commissioned essays to provide a tour d'horizon of this broad range of topics and disciplines. The editors have enlisted eminent researchers across the social sciences to illustrate the debates, concepts and analytic approaches of this widely diverse and dynamic field. This volume will be essential reading, a ready-to-hand reference book surveying the state of the art for anyone involved in, and actively concerned about research on the social, political, economic, psychological, geographic and historical

aspects of food. It will cater for all who need to be informed of research that has been done and that is being done.

A complete guide to the evolving methods by which we may recover by-products and significantly reduce food waste Across the globe, one third of cereals and almost half of all fruits and vegetables go to waste. The cost of such waste – both to economies and to the environment – is a serious and increasing concern within the food industry. If we are to overcome this crisis and move towards a sustainable future, we must do everything possible to utilize innovative new methods of extracting and processing valuable by-products of all kinds. Food Wastes and By-products represents a complete primer to this important and complex process. Edited and written by leading researchers, the text provides essential information on the supply of waste and its composition, identifies foods rich in valuable bioactive compounds, and explores revolutionary methods for creating by-products from fruit, vegetable, and seed waste. Other chapters discuss the nutraceutical properties of value-added by-products and their uses in the manufacturing of dietary fibers, food flavors, supplements, pectin, and more. This book: Explains how reconstituted by-products can best be used to radically reduce food waste Discusses the potential nutraceutical assets of recovered food waste Covers a broad range of by-product sources, such as mangos, cacao, flaxseed, and spent coffee grounds Describes novel extraction processes and the emerging use of nanotechnology A significant contribution to the field, Food Wastes and By-products is

a timely and essential resource for food industry professionals, government agencies and NGOs involved in nutrition, agriculture, and food production, and university instructors and students in related areas.

Promote inquiry-based learning and environmental responsibility at the same time. *Composting in the Classroom* is your comprehensive guide offering descriptions of a range of composting mechanisms, from tabletop soda bottles to outdoor bins. Activities vary in complexity -- you can use this as a whole unit, or pick and choose individual activities.

Food Industry Wastes: Assessment and Recuperation of Commodities presents emerging techniques and opportunities for the treatment of food wastes, the reduction of water footprint, and creating sustainable food systems. Written by a team of experts from around the world, this book provides a guide for implementing bioprocessing techniques. It also helps researchers develop new options for the recuperation of these wastes for community benefit. More than 34 million tons of food waste was generated in the United States in 2009, at a cost of approximately \$43 billion. And while less than three percent of that waste was recovered and recycled, there is growing interest and development in recovering and recycling food waste. These processes have the potential not only to reduce greenhouse gases, but to provide energy and resources for other purposes. This book examines these topics in detail, starting with sources, characterization and composition of food wastes, and development of green production

strategies. The book then turns to treatment techniques such as solid-state fermentation and anaerobic digestion of solid food waste for biogas and fertilizer. A deep section on innovative biocatalysts and bioreactors follows, encompassing hydrogen generation and thermophilic aerobic bioprocessing technologies. Rounding out the volume are extensive sections on water footprints, including electricity generation from microbial fuel cells (MFCs), and life cycle assessments. Food waste is an area of focus for a wide range of related industries from food science to energy and engineering. Outlines the development of green product strategies. International authoring team represents the leading edge in research and development. Highlights leading trends of current research as well as future opportunities for reusing food waste. One of the earliest scientific works on all aspects of compost and manure. Still of value today, especially to those interested in organic agriculture. Howard is the author of the very influential book "An Agricultural Testament."

Organic waste composting is another excellent example to demonstrate the power and the benefits of nexus thinking. Even though organic waste composting itself is not a new topic, those who want to start a new project or align an ongoing project with nexus thinking, find it difficult to gather the necessary information. With nine case studies from four continents, this book aims to fill above gap in literature. While current literature on composting is often found to be limited to either soil/agriculture sector or waste management sector, this book presents a combined point of view. This open access

book starts with an introductory chapter that describes the need to bring the waste management aspects and soil nutrient management aspects of compost production into one integrated theme. The relevance of nexus thinking and the Sustainable Development Goals (SDGs) are also presented in this introduction. The first three chapters after the introduction covers composting from the solid waste management and its policy aspects, taking examples from three developing countries. The next three examples are mostly about the benefits composting can provide to the soil and agriculture. These examples are also from three developing countries, but with a mixture of urban as well as rural settings. Last three chapters present more insight into the latest developments taking examples from Europe, as well as new methods adapted from the traditional styles from Africa.

This comprehensive handbook represents a definitive state of the current art and science of food waste from multiple perspectives. The issue of food waste has emerged in recent years as a major global problem. Recent research has enabled greater understanding and measurement of loss and waste throughout food supply chains, shedding light on contributing factors and practical solutions. This book includes perspectives and disciplines ranging from agriculture, food science, industrial ecology, history, economics, consumer behaviour, geography, theology, planning, sociology, and environmental policy among others. The Routledge Handbook of Food Waste addresses new and ongoing debates around systemic causes and solutions, including

behaviour change, social innovation, new technologies, spirituality, redistribution, animal feed, and activism. The chapters describe and evaluate country case studies, waste management, treatment, prevention, and reduction approaches, and compares research methodologies for better understanding food wastage. This book is essential reading for the growing number of food waste scholars, practitioners, and policy makers interested in researching, theorising, debating, and solving the multifaceted phenomenon of food waste.

Benefits and drawbacks; The composing process; Raw materials; Composting methods; Composting operations; Management; Site and environmental considerations; Using compost; Marketing agricultural compost; Farm composting economics: focus on production costs; Other options for waste management and composting; Characteristics of raw materials; Equipment tables; Troubleshooting and management guide; Work sheets and forms; Environmental agencies; Metric conversions.

Rapid industrialization is a serious concern in the context of a healthy environment. With the growth in the number of industries, the waste generated is also growing exponentially. The various chemical processes operating in the manufacturing industry generate a large number of by-products, which are largely harmful and toxic pollutants and are generally discharged into the natural water bodies. Once the pollutants enter the environment, they are taken up by different life forms, and because of bio-

magnification, they affect the entire food chain and have severe adverse effects on all life forms, including on human health. Although, various physico-chemical and biological approaches are available for the removal of toxic pollutants, unfortunately these are often ineffective and traditional clean up practices are inefficient. Biological approaches utilizing microorganisms (bacterial/fungi/algae), green plants or their enzymes to degrade or detoxify environmental pollutants such as endocrine disruptors, toxic metals, pesticides, dyes, petroleum hydrocarbons and phenolic compounds, offer eco- friendly approaches. Such eco-friendly approaches are often more effective than traditional practices, and are safe for both industry workers as well as environment. This book provides a comprehensive overview of various toxic environmental pollutants from a variety natural and anthropogenic sources, their toxicological effects on the environment, humans, animals and plants as well as their biodegradation and bioremediation using emerging and eco-friendly approaches (e.g. Anammox technology, advanced oxidation processes, membrane bioreactors, membrane processes, GMOs), microbial degradation (e.g. bacteria, fungi, algae), phytoremediation, biotechnology and nanobiotechnology. Offering fundamental and advanced information on environmental problems, challenges and bioremediation approaches used for the remediation of contaminated sites, it is a valuable resource for students, scientists and researchers engaged in microbiology, biotechnology and environmental sciences.

The continuously increasing human population, has resulted in a huge demand for processed and packaged foods. As a result of this demand, large amounts of water, air, electricity and fuel are consumed on a daily basis for food processing, transportation and preservation purposes. Although not one of the most heavily polluting, the food industry does contribute to the increase in volume of waste produced as well as to the energy expended to do so. For the first time, nine separate food industry categories are thoroughly investigated in Waste Management for the Food Industries in an effort to help combat this already acute problem. The current state of environmental management systems is described, offering comparisons of global legislation rarely found in other resources. An extensive review of commercial equipment, including advantages and disadvantages per employed waste management technique, offers a unique perspective for any academic, student, professional, and/or consultant in the food, agriculture and environmental industries. Thoroughly examines the most prevalent and most polluting industries such as Meat, Fish, Dairy, Olive Oil, Juice and Wine industries Includes synoptical tables [methods employed, physicochemical or microbiological parameters altered after treatment etc] and comparative figures of the effectiveness of various waste management methods Contains nearly 2500 of the most up-to-date references available

The Practical Handbook of Compost Engineering presents an in-depth examination of the principles and practice of modern day composting. This comprehensive book

covers compost science, engineering design, operation, principles, and practice, stressing a fundamental approach to analysis throughout. Biological, physical, chemical, thermodynamic, and kinetic principles are covered to develop a unified analytical approach to analysis and an understanding of the process. A brief history of the development of composting systems, which leads to descriptions of modern processes, is presented. The Practical Handbook of Compost Engineering also discusses the elements of successful odor management at composting facilities, including state-of-the-art odor treatment and enhanced atmospheric dispersion. The book is excellent for all engineers, practitioners, plant operators, scientists, researchers, and students in the field.

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