

1. Record Nr.	UNINA9910488731303321
Autore	Erickson Larry E
Titolo	Phytotechnology with biomass production : sustainable management of contaminated sites // edited by Larry E. Erickson and Valentina Pidlisnyuk
Pubbl/distr/stampa	Taylor & Francis, 2021 Boca Raton : , : CRC Press, , 2021
ISBN	1-00-308261-0 1-003-08261-0 1-000-38728-3 1-000-38730-5
Edizione	[First edition.]
Descrizione fisica	1 online resource (243 pages)
Disciplina	628/.74
Soggetti	Phytoremediation Soil remediation Energy crops SCIENCE / Environmental Science TECHNOLOGY / Agriculture / Soil Science
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Half Title -- Title Page -- Copyright Page -- Table of Contents -- Preface -- Acknowledgments -- Editors -- Contributors -- 1. Introduction -- 1.1 Soil Quality -- 1.1.1 Soil Contamination -- 1.1.2 Types of Contaminants -- 1.2 Phytotechnology with Biomass Production -- 1.3 Miscanthus -- 1.4 Case Studies -- References -- 2. Phytotechnologies for Site Remediation -- 2.1 Introduction -- 2.2 Phytotechnologies -- 2.3 Phytostabilization of Arable Land Contaminated with Trace Elements -- 2.4 Bioenergy Crops and Phytostabilization Options -- 2.5 <i>M. x giganteus</i> as an Effective Phytoagent -- 2.5.1 Miscanthus Tolerance to Metals and Removal Capacity -- 2.5.2 Changes in Soil Parameters Induced by Miscanthus Phytoremediation -- 2.6 Miscanthus Phytotechnology in Action -- 2.6.1 <i>M. x giganteus</i> Application for Phytoremediation of Trace Elements' Contaminated Mining Soil, Tekeli, Kazakhstan -- 2.6.2 <i>M. x giganteus</i>

Application for Phytoremediation of Post-Industrial Soil Contaminated with Trace Elements, Bakar, Croatia -- 2.6.3 Field Study Results, Fort Riley, Kansas, USA -- 2.7 Conclusions -- References -- 3. Remediation of Sites Contaminated by Organic Compounds -- 3.1 Introduction -- 3.2 Types of Organic Contaminants -- 3.2.1 Remediation of Petroleum Contaminants -- 3.2.2 Remediation of Explosives -- 3.2.3 Remediation of Chlorinated Hydrocarbons -- 3.2.4 Remediation of Pesticides -- 3.3 Landfills and Containment -- 3.4 Phytoremediation of Organic Contaminants with *Miscanthus* -- References -- 4. Phytomining Applied for Postmining Sites -- 4.1 Introduction -- 4.2 Advantages and Limitations of Phytomining -- 4.3 Field Experiments on Phytomining -- 4.4 Agronomic Practices -- 4.5 Economic Viability and Environmental Considerations -- 4.6 Options for Commercial Application of Phytomining -- 4.7 Conclusions and Perspectives -- References.

5. Establishing *Miscanthus*, Production of Biomass, and Application to Contaminated Sites -- 5.1 Plant Selection and Breeding -- 5.2 Plant Establishment -- 5.2.1 Weight -- 5.2.2 Water -- 5.2.3 Weeds -- 5.2.4 Weather -- 5.3 Site Characterization -- 5.4 Plant Nutrition and Supplementation -- 5.5 Role of Soil Amendments -- 5.5.1 Impact of Soil Amendments on the Phytoremediation of Soil Contaminated by Organic Substances -- 5.5.2 Impact of Soil Amendments on *Miscanthus* Production in Postmilitary Soil -- 5.5.3 Impact of Soil Amendments on *Miscanthus* Biomass Production in Contaminated Postmining Soil -- 5.6 Geography and Soil Types -- 5.7 Role of Plant Growth Regulators in Production of *M. x giganteus* -- 5.7.1 Lab Research on Impact of PGRs on Phytoremediation with Biomass Production Using Soils from Military Sites Contaminated with Trace Elements -- 5.7.2 Field Research on Impact of PGRs on Biomass Parameters of *M. x giganteus* during Field Production on the Marginal and Slightly Contaminated Lands -- References -- 6. Balancing Soil Health and Biomass Production -- 6.1 Introduction -- 6.2 Properties of Soils -- 6.3 Soil Quality -- 6.4 Soil Health Affects Human Health -- 6.5 Improving Soil Health Using Phytotechnology -- 6.6 Conclusions -- References -- 7. Plant-Microbe Associations in Phytoremediation -- 7.1 Role of Plant-Microbe Association in Phytoremediation -- 7.1.1 Endophytic Bacteria -- 7.1.2 Rhizobacteria -- 7.2 Impact of PGPB Isolated from Contaminated Soil to Phytoremediation with *Miscanthus* -- 7.3 Influence of Rhizobacteria Isolated from *Miscanthus* Rhizosphere to Phytoremediation of Trace Elements Contaminated Soil -- 7.4 Changing of Soil Microbial Communities during *Miscanthus* Production at the Contaminated Military Land -- References -- 8. Plant Feeding Insects and Nematodes Associated with *Miscanthus* -- 8.1 Introduction.

8.2 Plant Feeding Insects with Piercing-Sucking Mouth Parts -- 8.2.1 *Miscanthus* Mealybug -- 8.2.1.1 Identification -- 8.2.1.2 Life Cycle -- 8.2.1.3 Damage -- 8.2.2 Aphids -- 8.2.2.1 Identification -- 8.2.2.2 Life Cycle -- 8.2.2.3 Damage -- 8.2.2.4 Identification -- 8.2.2.5 Life Cycle -- 8.2.2.6 Damage -- 8.3 Plant Feeding Insects with Chewing Mouth Parts -- 8.3.1 Generalist Coleoptera -- 8.3.1.1 Identification -- 8.3.1.2 Life Cycle -- 8.3.1.3 Damage -- 8.3.2 Generalist Lepidoptera -- 8.3.2.1 Identification -- 8.3.2.2 Life Cycle -- 8.3.2.3 Damage -- 8.3.3 Generalist Coleopteran -- 8.3.3.1 Identification -- 8.3.3.2 Life Cycle -- 8.3.3.3 Damage -- 8.4 Plant Feeding Nematodes Associate with *M. x giganteus* -- 8.4.1 PPNs Potential Vector of Plant Viruses -- 8.4.2 Ecto-, Endoparasites, and Hyphal/Root Feeders -- 8.4.3 The Indication of *M. x giganteus* Plantation State with Plant-Feeding Nematodes -- References -- 9. Economics of Phytoremediation with Biomass Production -- 9.1 Introduction to Phytoremediation with Biomass Production -- 9.2 Sustainable Approach -- 9.3 Benefits of

Remediation -- 9.4 Motivation for Action -- 9.5 Economics of Phytoremediation -- 9.6 Economics of Biomass Production -- 9.7 Bioeconomy of Miscanthus in Europe -- 9.8 Conclusions -- References -- 10. Miscanthus Biomass for Alternative Energy Production -- 10.1 Introduction -- 10.2 Evaluation of Biomass Suitability for Energy -- 10.3 Bioethanol Production -- 10.3.1 Physicochemical Pretreatment -- 10.3.2 Enzymatic Hydrolysis and Fermentation -- 10.4 Biomethane and Biohydrogen Production -- 10.5 Thermochemical Conversion -- 10.5.1 Heat and Power Generation -- 10.5.2 Bio-Oil and Syngas Production -- References -- 11. Miscanthus as Raw Materials for Bio-based Products -- 11.1 Introduction -- 11.2 Material Products -- 11.2.1 Agricultural Products -- 11.2.1.1 Bedding Applications. 11.2.1.2 Mulch Applications -- 11.2.2 Insulation -- 11.2.3 Composites, Building Materials, Cement -- 11.2.4 Composite Materials -- 11.2.5 Hemicelluloses -- 11.3 Processing of Miscanthus to Fibers, Pulp, and Papers -- 11.4 Production of Pulp from *M. x giganteus* Biomass Produced on Pb-Contaminated Soil -- References -- 12. Conclusions and Recommendations -- 12.1 Conclusions -- 12.2 Recommendations -- References -- Index.

Sommario/riassunto

"This book explains the concept of using phytotechnology with biomass production to improve soil quality and produce valuable products that have economic and social value. It is focused on the application of second generation biofuel crops to slightly contaminated or marginal post-military and post-mining soils. Based on recent research from the US, Ukraine, Germany, and Poland, along with studies from other countries, this is the first comprehensive book on using phytotechnology with biomass production at contaminated sites at a global level. It's also a great new resource for those who want to study and plan phytotechnology projects as well as those who carry them out"

--
